RM-78-51

THE GENERAL SITUATION AND MAIN TENDENCIES OF FOOD AND AGRICULTURAL DEVELOPMENT IN THE EUROPEAN CMEA MEMBER COUNTRIES (1960-1975 AND UP TO 1980)

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PREFACE

Within the framework of IIASA's Food and Agriculture Program a consistent set of national food and agricultural policy models is going to be developed suitable for quantifying intra and inter-country and global food interdependencies. It is obvious that any system analysis model has to be based on detailed knowledge in the field to be described. Therefore the assessment of national and international food and agricultural policies and situations has to be the first step in realizing our objectives. In this paper the agricultural development and basic policy objectives in the European CMEA (Council for Mutual Economic Assistance) member countries are discussed. The creation and development of general economic conditions for food and agricultural production is investigated. The utilization of land, productive livestock, mechanization and chemicals is estimated. The levels, trends and rates of production and consumption of the main agricultural products are presented together with the main aims, characteristic features and results of the contemporary agrarian policy in the CMEA countries.

A further part of our problem assessment is given by S.C. Schmidt* and S.C. Schmidt and H.O. Carter** who investigated the situation of national and international food policies and options that impact on world trade and aid, and H. de Haen, J.V. Schrader, and S. Tangermann*** who discussed the question of modelling in the EC agricultural sector, and C.Csaki, A. Jonas & S.Meszaros who discussed the modelling of centrally planned food and agricultural systems.****

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* S.C. Schmidt: "Assessment of Existing and Prospective World Economic and Food Trends", IIASA, RM-77-14

** S.C. Schmidt and H.O. Carter: "National and International Food Policies that Impact on World Trade and Aid, IIASA, RM-78-22

*** H. de Haen, J.V. Schrader, S. Tangermann: " Modelling the EC Agricultural Sector: Problem Assessment, Policy Scenarios and Model Outline", IIASA, RM-78-23

**** C. Csaki, A. Jonas, S. Meszaros: "Modelling of Centrally Planned Food and Agricultural Systems: A Framework for a National Policy Model for the Hungarian Food and Agriculture Sector", IIASA, RM-78-11

ABSTRACT

The preliminary assessment of food and agriculture development in the European CMEA (Council for Mutual Economic Assistance) member countries presented here is a separate part of the common investigation into the world food and agriculture situation, tendencies and problems being studied by IIASA's Food and Agriculture Program.

Its aim is to present a general survey of the chosen characteristic trends and problems of food and agriculture development in these countries and of some production, economic and social factors which have determined this development.

The data incorporated in the tables and interpreted in this book have been taken from the official CMEA Annual books, from the National Annual books of the CMEA member countries and from other publications mentioned in the references. Tables and diagrams have been used to illustrate data for 1960, 1965, 1970 and 1975. When necessary, the average five years data concerning the five-year-plan period of these countries are also used.

ACKNOWLEDGEMENTS

In the investigations of these problems, the author has been supported by the scientists and the technical assistance of IIASA's Food and Agriculture Program and he wishes to express his deepest gratitude for their help.

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The author is grateful to the colleagues he met during his visits to CMEA member countries for their helpful suggestions and comments.

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SYMBOLS AND TERMS

——	Data not available
...	Absence of data
cwt	100 kg
tons	metric tons
GSP	Gross Social Product
NIP	National Income Produced

INTRODUCTION

Food and agriculture in the CMEA member countries is an important and inseparable part of the world's food and agriculture. The CMEA member countries include about 1/5 of the world's cultivated land and plantations of perennial plants. They produce around 1/4 of the world's food and agricultural production, including almost 1/3 of the volume of some more important crops and animal products. The percentage share of these countries in the general structure of world trade in food and agricultural goods is much higher. Their active participation in international trade exerts a considerable influence on the situation and trends of the agrarian markets.

Food and agriculture in the CMEA member countries makes a contribution towards solving one of the most important social, economic and political problems of the contemporary world, ensuring a more adequate and nutritious diet for mankind.

All attempts to assess the food and agriculture situation, trends and problems in the world today and in the future would be imperfect without an analysis and assessment of food and agriculture development in this Community, especially in the European CMEA member countries, and of its influence on the food and agriculture development in other countries.

So far the economic, social and agro-political aspects of this development have been insufficiently investigated. The gap is particularly wide in the area of the comparative complex assessment of situations, trends and problems of development in the individual countries, connected with the general food and agriculture development on a global or regional (primarily European) scale.

The share of food and agriculture in the national production structure in these countries has decreased as a result of the more rapid development of industry. In spite of this the absolute volume of food and agriculture production has increased.

The growth has taken place against a background of considerable structural change within the national economy of each individual country and within the Community as a whole:

- the size of the population has increased and the employment structure has changed;

- dynamic changes have occurred in the growth of national gross social product, in personal income, and also in the living standards of all social groups;

- an extensive relocation of manpower has taken place and quickly increased urbanization;

- the share of processed agricultural production has systematically increased;

- the influence of the national and international market has been augmented by the sale and purchase of food and agricultural goods to satisfy national food requirements;

- considerable changes in national food structure and in the nutrition of the various professional and other social groups have been made.

The development in food and agriculture in the European CMEA countries has also been extended by significant internal changes.

- in a very short time the steady production concentration, has brought about a considerable amalgamation of enterprises, thus increasing their output;

- the continuous systematic expansion of production specialization in individual farms, regions and countries has sharply increased the market volume produced by food and agricultural enterprises;

- the continual increase in mechanization, chemicalization and modernization of agricultural production has effected a wider application of industrial methods in this branch of the national economy;

- the organization of large agricultural production units, and in particular the integration in them of some industrial processing activities, has stimulated the further development of horizontal and vertical integration;

- the development of the individual agro-industrial and industrial-agrarian complexes and the national agro-industrial complex presents new opportunities for the solution to the problems of food and agricultural development, taking into account the trends, rates and needs for the development of other branches of the national economy;

- the responsibilities of leadership and management in the agro-industrial complexes cover the whole range of activities within the micro-region or region;(not only the production organization but also such diversified areas as public utilities, transport, communal, social and other activities),thus making the management responsible for guiding all activities in the whole regional complex. This is particularly relevant in Bulgaria.

The food and agriculture development in the Community* countries, and the development of their national economies as well, is taking place under the influence of some external factors, the most important of which are:

- the further development and improvement of international economic integration among commodity producing countries;

- the intensification of international production specialization, and increasing trade turnover of food and agricultural goods;

- the increasing industrial cooperation and scientific-technical collaboration aiming to establish a modern technical base for the further development of their national economy, including food and agriculture;

- the increasing economic, industrial and scientific-technical connections between the socialist and non-socialist countries in all fields of the economy, including food and agriculture.

Careful analysis of these factors will demonstrate that formerly their influence on food and agriculture development was considerable. It will also indicate the trends, growth rates and dimensions of future development, and their influence in a global context, in particular the solution of the vital problem of producing more food supplies contributing towards a healthier diet for mankind.

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* Community is used here and throughout this paper to refer to the CMEA countries, particularly the European CMEA countries.

I. GENERAL ECONOMIC CONDITIONS FOR FOOD AND AGRICULTURE DEVELOPMENT

1. Area and Population

Agriculture and food industry development in most of the European centrally planning countries over the last two and a half decades has been carried out under the influence of a coordinated general economic policy within the framework of the Council for Mutual Economic Assistance (CMEA).

Created in 1949, today the CMEA consists of ten countries (Bulgaria, Hungary, Vitnam, the GDR, Cuba, Mongolia, Poland, the USSR, Romania and Czechoslovakia). Yugoslavia is included as an observer and as a participant in some of the initiatives of the CMEA.

At the end of 1975, the CMEA member countries together comprised 9.6% of the world population, 17.8% of the world land resources, 19.8% of the cultivated land and plantations of perennial plants (orchards and vineyards) and 15.7% of the natural meadows and pastures.

The greatest part of the Community's territory and population is in the European CMEA member countries. The combined area of these countries totals 23,390 thousand square km and the total population numbers 362,046 thousand people.[1]

The USSR has the largest territory with 22,402 thousand square km, or 95.76% of the total area of all European CMEA member countries. Poland ranks second with 313,000 square km territory and Romania third with 238,000 square km. The remaining countries are nearly equal in area (their territory is about 100,000 square km).

The total area covered by these countries is quite extensive - more than 180°20' east to west, and 32°24' north to south (from Vacha in the GDR [10°10' east longitude], to Mys Dezhneva, USSR [169°40' west longitude], and from Kushka, USSR [latitude 35°18'N] to Mys Chelyuskin, USSR [latitude 77°42'N]).

This area includes many clearly defined climatic zones and regions, and various conditions suitable for most of the tropical and some subtropical crops, almost all other important agricultural crops can be grown and cultivated in the countries of the Community.

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[1] All statistical terms in this report are those used in the 1976 "Statistical Yearbook of the CMEA", published by IPC Industrial Press Ltd, London.

The maximum rational utilization of the vast resources and the advantages of the central planning system are very important prerequisites for dynamic agricultural development, for the solution to the food problems in these countries and for their contribution to the world's food problem. The favorable conditions are:

- opportunities for basic agricultural crop cultivation in vast areas;

- agricultural production specialization with its concentration in zones, regions and micro-regions under optimal conditions for separate crop utilization and animal breeding;

- the large possibilities for use of modern scientific and technical achievements for further agricultural production intensification, etc.

Because of these conditions all of the European CMEA member countries have the possibility of providing their own people with the most important agricultural and food products. At the same time by expanding the labor division in the field of agriculture and increasing specialization in the production of main crops, they can provide considerable quantities of food for international markets.

The geographical situation of the Community also determines some negative conditions which have an impact on its agriculture and food problem. This is because the severe (in some Soviet regions for example) natural, mainly climatic, conditions and their unexpected fluctuations, still represent a serious danger to agricultural crop cultivation in some years. Recently experience has shown that modern scientific achievements and available techniques still cannot compensate for the considerable influence of these factors.

The population and labor resources also greatly influence the further solution of agricultural and food problems in all these countries. Due to the possession of considerable labor resources, and using the possibilities of the socialist economic system, these countries are able to maintain the necessary amount of skilled manpower in the country in agricultural production, equip them with the required techniques and provide them with the necessary living and working conditions. This was done with the development of virgin soils in the USSR.

On the other hand, a large population with ongoing structural changes in its production, and a rising standard of living, leads to a systematic and continuous increase in consumption of agricultural goods and materials, and changes the balance already achieved between production and needs.

A typical feature in almost all Community member countries is that the number of industrial and office workers has grown very rapidly, the social group of the member of cooperative farms has stabilized, and the number of peasants and craftsmen having a privately owned plot has decreased. According to the data from recent censuses in individual countries, the population distribution in social groups was as follows:

Bulgaria (Census of 2 December 1975): 83.8% workers and employees, 15.4% peasants belonging to agricultural production co-operatives, craftsmen and artisans in co-operatives, 0.8% individual peasants and artisans not in co-operatives, professions and other social groups.

Hungary (Census at the beginning of 1975): 78.8% workers and employees, 17.7% peasants belonging to agricultural production co-operatives of all types, craftsmen and artisans in co-operatives, 3.1% individual peasants, craftsmen and artisans not in co-operatives, and 0.4% professions and other social groups.

GDR (Census 1 January 1971): 82.3% workers and employees, 11.7% peasants belonging to agricultural production co-operatives of all types, craftsmen and artisans in co-operatives, 3.7% individual peasants, craftsmen and artisans not in co-operatives, 0.3% professions, and 2.0% other social groups.

Poland (Census of 30 March 1974): 72.2% workers and employees, 3.7% peasants belonging to agricultural production co-operatives, craftsmen and artisans in co-operatives, 23.6% individual peasants and artisans not in co-operatives, 0.5% professions and other social groups.

Romania (Census of 15 March 1966): 52.2% workers and employees, 40.9% peasants belonging to agricultural production co-operatives, craftsmen and artisans in co-operatives, 6.1% individual peasants and artisans not in co-operatives, 0.8% professions and other social groups.[2]

USSR (Census at the end of 1975): 83.6% workers and employees, 16.4% peasants belonging to agricultural production co-operatives, craftsmen and artisans in co-operatives.

Czechoslovakia (Census at the end of 1975): 89.7% workers and employees, 10.0% peasants belonging to agricultural production co-operatives, craftsmen and artisans in co-operatives, 0.9% individual peasants and artisans not in co-operatives, and 0.1% professions.

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[2] The data for Romania are valid from 1 July of each year.

The average population density in the European CMEA member countries during 1975 was 15.47 per square km. It was approximately equal to that of Europe and differed little from that of the world. The population density per square kilometer varied from 89 to 115 people in most of the countries (as at the end of 1975). There was considerable deviation from that in the USSR, where the average density was 11.5 people per sq km and the GDR where the average density was markedly higher and reached up to 155 people per sq km. In 1975 the entire population in Europe with the exception of the Soviet Union totalled 472,979 thousand. In the European CMEA countries, the population was 360,576 thousand.

In the period 1960-75, the total urban population of the European CMEA countries increased by 15.11%, whereas the rural population decreased by 9.21%.(See Figure 1)

During this period the population of the USSR, Poland and Romania increased most rapidly; the population of Bulgaria and the CSSR increased moderately, and the Hungarian population increased at a slower rate. There was an absolute decrease in the population of the GDR.

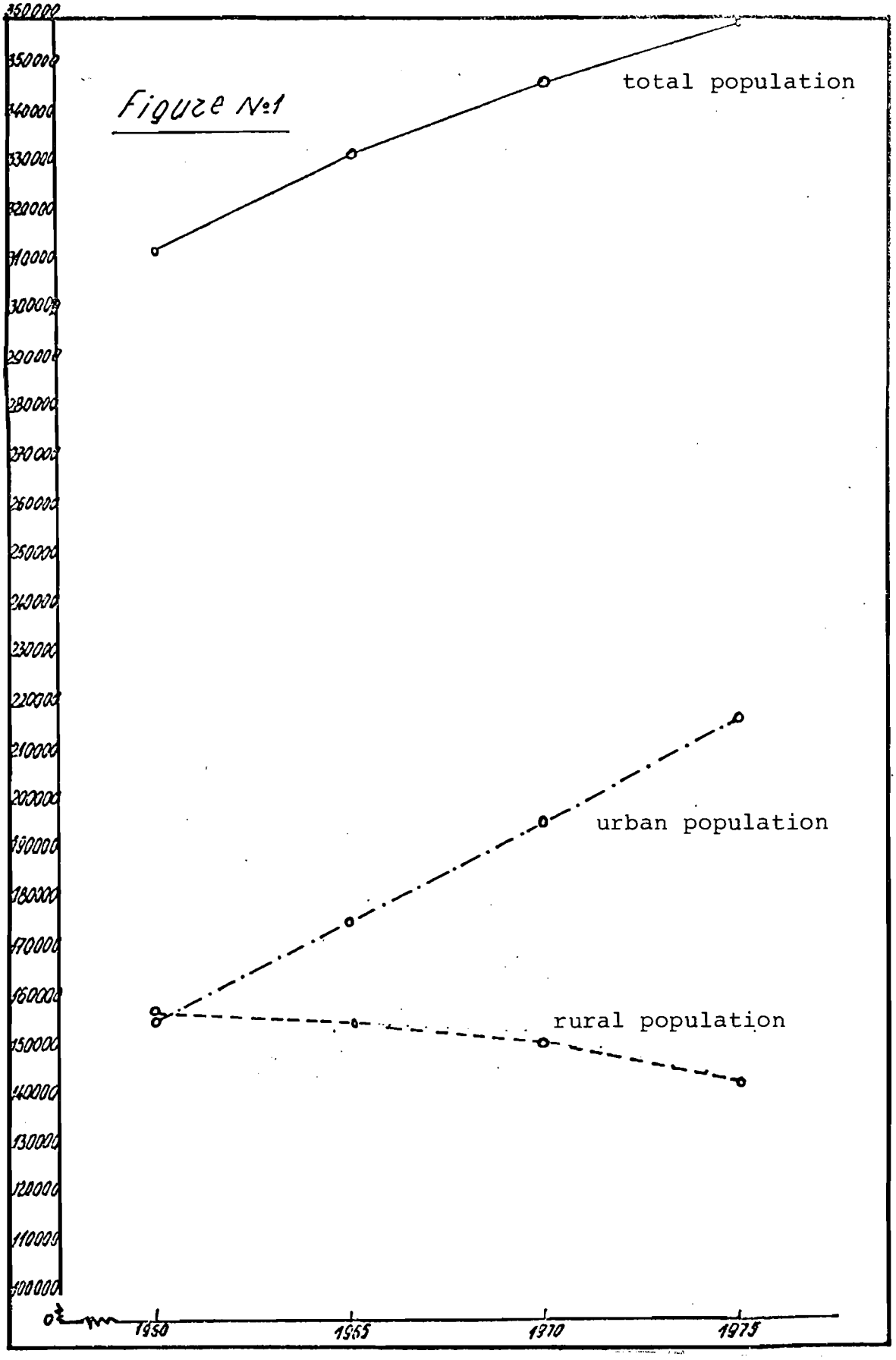
The highest average population increase during the last five-year-plan period (1971-1975), belonged to Romania with 9.92 per 1000 people, correspondingly, Poland increased by 9.58 per 1000 people and the USSR by 9.2 per 1000, the CSSR by 6.92 Bulgaria by 6.42, and the lowest was Hungary with 4.18 per 1000 people.

The major factor in the rapid development of urbanization is the growing industrialization and collectivization of agriculture, implemented after the Second World War. The difference in the development rate of these processes has determined the difference in the rate of urbanization. Thus the urban population of Bulgaria over the last 15 years has increased by 68.62%, in Romania by 66.28% and in the USSR by 45.15%.

This process has developed at a slower rate in Poland, the CSSR and Hungary where the growth of the urban population was respectively, 32.15%, 23.69% and 22.15%. The reason for this lies in the fact that even at the very beginning of the investigated period, the degree of urbanization of these countries was comparatively high. The most typical case is the GDR where an absolute increase in the urban population rose by 2.59%. This increase is insignificant because the correlation between the urban and rural population there, even in 1960, was decisively in favor of the urban population.

In spite of differences in individual countries, and periodic fluctuations, the urbanization in the Community over the last 15 years has taken place primarily because of the requirements of rapidly

URBAN AND RURAL POPULATION FOR ALL EUROPEAN CMEA MEMBER COUNTRIES (THOUSAND) AT YEAR'S END.



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл.9

developing industrialization and the social reconstruction of agriculture. It has been implemented under the strong influence of the states' economic policy, and directed with the help of definite economic and social factors. Agricultural manpower has been replaced by mechanization, and has been diverted to various branches of industry in the new production regions and microregions, which play an important part in the new national economic structure. Experience in the European central planning countries has shown very clearly that, under conditions of economic necessity, there is a considerable and rapid shift of the population from rural to urban areas. This change is usually connected with vast capital investment by the State, the creation of new industries, buildings and transportation systems. Considerable expenditure is also needed to finance a new infrastructure and manpower retraining.

However, experience has also shown even under conditions of central planning, the process of accelerated urbanization has been accompanied by such negative economic results as temporary overcrowding in towns simultaneous with vacant residential buildings in the villages; and the entry of a new labor force into industry, building and transportation systems with insufficient qualifications for the vacancies. The short-term employment imbalances occur between the volume of manpower available and the positions they can fill.

Owing to the rapidity of urbanization, it is very difficult to find the optimal solution to the structuring of manpower in agriculture. After the sharp decrease in manpower engaged in this sector, the age, sex, and qualifications of this labor force have to be adapted to the new production conditions. The number of adults, wives and workers with low technical knowledge is much higher than required. To replace them with skilled labor would only be possible after they have retired, or been retrained.

The dynamics of demographic structural changes in the European CMEA member countries have influenced their general development and have given rise to several economic and social problems. This has also had repercussions on the food situation and the related areas of agriculture and the food industry.

Some factors exercise a negative influence on the solution of the food problem, especially during the first estimated years of the new socio-economic system, when the food industry was being constructed on a socialist basis and the production capacities of the system had not been thoroughly explored. These factors include:

- the migration of the rural population has resulted in a very rapid loss of manpower in the agricultural sector;

- the increased urban population engaged in industry, construction, transport, trade, education, administration, etc. has created a great demand for agricultural products and foodstuffs;

- the higher living standards of the urban and rural population and the stabilization of incomes have created a demand for more food of a higher nutritional value.

The positive factors influencing the food situation are:

- the adoption of new technology in agricultural production to replace the loss of manpower with more powerful and productive mechanical means;

- the introduction of scientific and technical achievements into production, such as more productive plant varieties, and animal breeds; the use of fertilizers to increase yields; the protection of plants and animals against pests and diseases; the improvement of drainage and irrigation; industrial methods of animal husbandry, etc.

- the rationalization of agriculture, by the construction of agricultural enterprises, specialization and concentration, to exploit the advantages of large-scale production and the most favorable natural conditions.

The increasing use of skilled labor in large-scale agricultural production has resulted in considerably higher productivity. The interaction of the above factors together with the perfection of the economic policy carried out during the investigated period is the key to the solution of the general food problem, and in particular to the solution of successful economic development of food and agriculture in each of these countries.

1.2 Capital Investment, Gross Social Product, and National Income Produced.

The primary increase of capital investment and its distribution between basic economic branches has played the most important role in the growth of the gross social product and net national income.

The greatest part of this investment has been distributed to industry and construction, which have become the leading sectors in the economies of the various countries. In 1975, the following percentages of total national capital investment were invested in these branches: in Romania, 44.8%; the GDR, 41.6%, PRB, 38.6%, CSSR, 37.4%; the USSR, 34.4%; Poland, 31.3% and Hungary, 28.2%.

Although all European CMEA countries paid marked attention to the further development of manufacturing industry, agriculture was also given a great increase in its capital investment allocation. In 1975, in the agricultural sector these percentages were: Poland, 15.3%; the USSR, 13.4%; Bulgaria, 12.4%; Hungary, 11.8%; Romania 11.4%; the CSSR, 8.2%, and the GDR, 8.1% of the total national capital investment.

However, the actual proportion of capital investment in agriculture is larger because part of the funds allocated to industry are used for developing agricultural machine-building, chemical fertilizers, road construction and land improvement projects, etc. As the industrialization of agriculture develops, so does its indirect share of these funds. The funds allocated to the basic food, wine and tobacco industries also have to be taken into account when estimating the total capital provided for agriculture.

Total capital investment in agriculture and forestry[3] in national currencies reached in 1975: in Bulgaria - 784 million levs, in Hungary - 21,963 million forints, in the GDR - 5,100 million marks, in Poland - 71,618 millions zlotys, in Romania - 18,540 million leas, in the USSR - 23,819 millions roubles, and in the CSSR - 16,558 million crowns. Considering the fact that national forestry development of most Community member countries did not change much during this period, it may be concluded that the above-mentioned changes have been caused by the amount of capital invested in agriculture.

An analysis of the available data shows that the increase in capital investment in agriculture and national forestry is followed by qualitative changes in the structure of the capital investment itself. There is an increased investment in machines, agricultural instruments and equipment and a decreased investment in construction installation work. Thus the proportion related to investment in machines, plant, tools, stock, increased as follows:

	1960	1975
Bulgaria	18.1%	30.2%
GDR	35.1%	41.1%
CSSR	29.3%	40.9%

At the same time there was a percentage decrease in construction-installation work:

	1960	1975
Bulgaria	52.1%	28.2%
GDR	61.0%	56.9%
CSSR	68.7%	56.6%

The relative proportion of investment in machines, plant, tools, stock, etc., was comparatively high over the investigated period in the USSR, varying from 33% to 40%, while in Poland this share remained constant. Construction-installation work decreased in the USSR from 61% to 58%, while in Poland the percentage rate remained the same.

The allocation of capital investment follows the opposite pattern in Romania and to a lesser extent Hungary, where investment in machines, plant, tools, stock, was as follows:

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[3] The CMEA statistics combine some data for agriculture with those of forestry.

Romania	1960, 43.1%	1974[4], 32.5%
Hungary	1960, 38.9%	1975[5], 40.0%

Construction-installation work rose in Romania from 31.9% in 1960 to 42.3% in 1974. Very considerable increases in this area were evident in Hungary.

Within the different CMEA countries, the diversity in the allocation in investment to agriculture is not connected with different approaches in their economic policy to this important agricultural development problem, but rather to some objective factors and conditions. These include, varying degrees of amalgamation, specialization, and concentration of agriculture during different periods, the diverse tasks solved by individual countries in the field of agriculture during these periods, the different rates of growth of the various economic branches at a given moment, etc.

Although the central planning countries have developed their agricultural policies on the principles of socialist cooperation of production, (Lenin's cooperative plan) the forms and especially the degrees of cooperation are varied. The available data shows that the agrarian and general economic policies in all the CMEA countries for the whole period aimed to carry out these forms and scales in correspondence with their general and political conditions, subject to the general tasks which this policy tries to solve.

On each development level of the national economy, the individual investment policies are designed for all the basic economic branches. The various forms and especially the degrees of agricultural cooperation, the level of production concentration and intensification, etc., also place considerable demands on the investment policy in the agricultural branch. For this reason, changes in form and scale of cooperation nearly always cause corresponding changes in a country's investment policy.

Increased power resources and the resulting electricity consumption have considerably influenced the European CMEA countries' economic development during this period. But the share of electric power consumed by agriculture has been considerably less than that consumed by industry, construction or transport. In 1975, the electric power consumed by agriculture and national forestry accounted for 3.8% of the total consumption in Bulgaria. In Hungary the percentage was 6.6, in the GDR 3.9, in Poland 3.1, in Romania 3.9, in the USSR 7.2, and in CSSR 4.3.

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[4] There are no data for 1975 for Romania

[5] In some years there were fluctuations when investments decreased, e.g. in 1970 to 27.8%.

However the data shows that electric power consumption in the agriculture and national forestry branches increased annually. Over the 15-year period, 1960-1975, the increase was as follows: Romania - 19.4 times more in 1975 than in 1960; Hungary - 19.2 times; CSSR - 7.4 times; the USSR - 6.7 times; Bulgaria - 5.8 times; Poland - 5.0 times; and the GDR - 2.5 times.

Compared to the corresponding rates of total increase in electric power consumption within the whole economy, these data show that the growth rate of consumption is higher in agriculture and national forestry than in any other branches. Of great importance is the increased use of electric power in a number of stationary processes in the stock-farms, farmyards, production stores and the enterprises for primary production processing, etc. Electrification in these types of activities expanded in nearly all of the socialist countries during the last few years, mainly as a result of the wide application of new industrial methods and technologies in agriculture.

The development of the chemical industry, particularly of chemical fertilizer and pesticide production, also had a significant influence on the solution of the food problem and on agricultural production after the Second World War. All CMEA countries continue to build and expand chemical plants for the production of nitrogenous, phosphorus and potash fertilizers and pesticides.

The total amount of mineral fertilizers produced in all European CMEA member countries in nutrient equivalent has increased from 6,509 thousand tons in 1960 to 32,587 thousand tons in 1975. Production of mineral fertilizers increased during this period correspondingly as follows: the USSR, 6.7 times; Hungary, 6.2 times; Poland 5.4 times; Bulgaria, 5 times; CSSR, 3.6 times; Romania, 2.4 times and the GDR, 1.8 times. Towards the end of the period (1975), the largest producers of potash fertilizers (K_2O) were the USSR with 7,944 thousand tons and the GDR with 3,019 thousand tons in nutrient equivalent. The USSR produced the biggest quantities of N_2 fertilizers with 8,535 thousand tons, followed by Poland with 1,533 thousand tons and Romania with 1,292 thousand tons. The USSR also produced the largest quantities of phosphorous fertilizers (P_2O_5) with 5,511 thousand tons, Poland - 929 thousand tons. The GDR produced 427 thousand tons.

The growth of capital investment in the main branches of the economies, the increased proportion of active production potential as well as the increasing skills of workers engaged in production and management, have contributed to an increase in gross social product of national income and real wages and salaries. It has directly influenced food and agriculture development in these countries and the economic, social and political problems connected with them.

During the last three five-year-plan periods (1961-1965, 1966-1970, 1971-1975), the indices for gross social product development showed a constant line of increase. In most of the cases, the increase took place at a rapid rate, especially

in Romania, Bulgaria and Hungary - countries which had the lowest gross social product volume at the beginning of the period. (See Figure 2)

The rapid rates of gross social product growth are primarily a result of the realization of the unified policy, coordinated within the framework of the Community at the beginning of the 1960s, for a gradual equalization of economic level among European CMEA members through more accelerated development of the less developed countries.

At the same time the policy of gradual economic equalization did not retard the development of the more advanced countries. This is clearly shown by the increase in the GSP of the USSR, the GDR, and the CSSR, countries which had highly developed economies even before being incorporated into the Community. However, the rates of growth of the GSP in this group of countries are lower, although the absolute volume is very high.

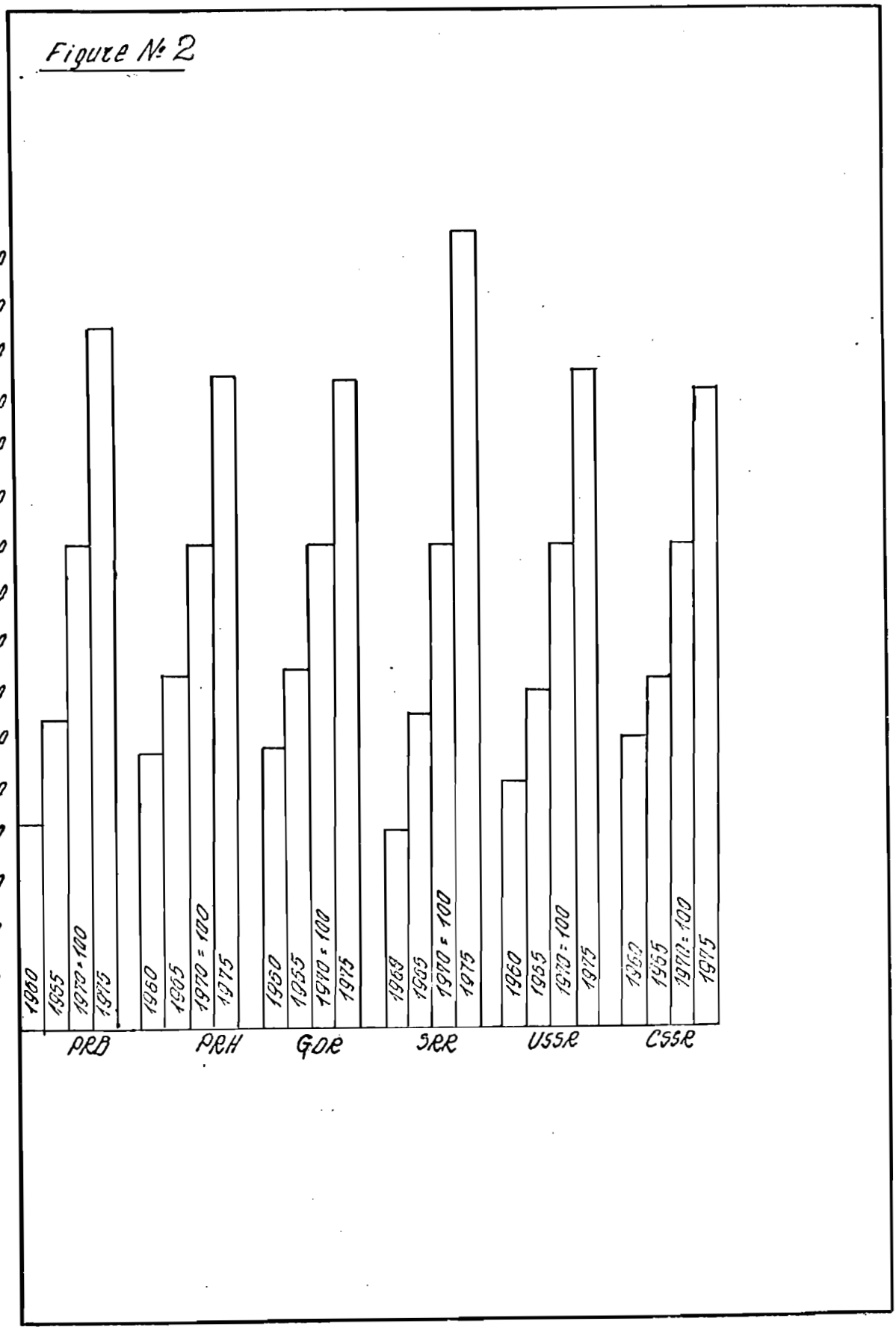
The increased gross social product is followed closely by the same tendency in the national income produced in these countries. During the investigated period the volume of the National Income, produced in Bulgaria has increased by 3 times; in Hungary - 2.3 times; the GDR - 2 times; Poland - 2.8 times; Romania - 3.9 times; the USSR - 2.6 times and the CSSR - 2 times. The rapid growth of national income created by industry in the less developed countries at the beginning of the period has played a decisive role in national income growth. In this period, Bulgaria's volume of national income produced in industry increased 4.3 times, Romania's, 6.4 times, and Hungary's, 2.8 times. At the same time the national income created by industry in countries which were more developed at the beginning of the period increased as follows: Poland, 3.7 times; the USSR, 3.5 times; the GDR, 2.2 times; the CSSR, 2.2 times.

National income rates and structure in the branches of the economy are determined by the deep structural changes that took place in the economies of the European CMEA countries after World War II. These changes have led to a considerable growth in the role of industry and show a tendency towards equalizing the industrialization level in the various countries.

In 1960 industry produced less than 50% of the national income in Bulgaria, Hungary, Poland and Romania. In 1975, the common national income produced in industry in all CMEA countries exceeded 50% of the total national income, and was considerably higher than the national income produced in agriculture and national forestry. The relative percentage of national income produced in industry was: the CSSR, 64.4%; the GDR, 62.2%; Romania, 57.1%; the USSR, 52.7%; Poland, 52.1%; and Bulgaria, 51.3%. Only in Hungary was this figure under 50%, although the process of industrialization increased rapidly too, and was 47.8% of the national income.

In spite of an absolute increase, the national income produced in agriculture and national forestry between 1960-1975, decreased in proportion to the total national income, as follows:

INDICES OF THE GROSS SOCIAL PRODUCT (1970 = 100)



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика,М., 1976, табл. 14

	1960	1975
Romania	34.9%	16.6%
Poland	30.3%	12.6%
Hungary	30.8%	16.3%
Bulgaria	32.2%	22.0%
GDR	16.4%	10.0%
CSSR	14.7%	8.3%

The NIP per capita in the economy as a whole also considerably increased although the rates of increase of these indices in the individual five-year-plans are not equal. (See Figure 3)

The increased national volume per capita has generally resulted in increased demands for food and agricultural goods, especially in those countries which formerly had difficulties in meeting the needs of the population. Such was the picture in many European countries prior to World War II, and for several years after it, including some of those countries which are now CMEA member countries.

1.3 Foreign Trade Turnover

The industrial and agricultural growth and the intensified concentration and specialization in production in CMEA countries has resulted in a considerable increase in the turnover of their foreign trade.

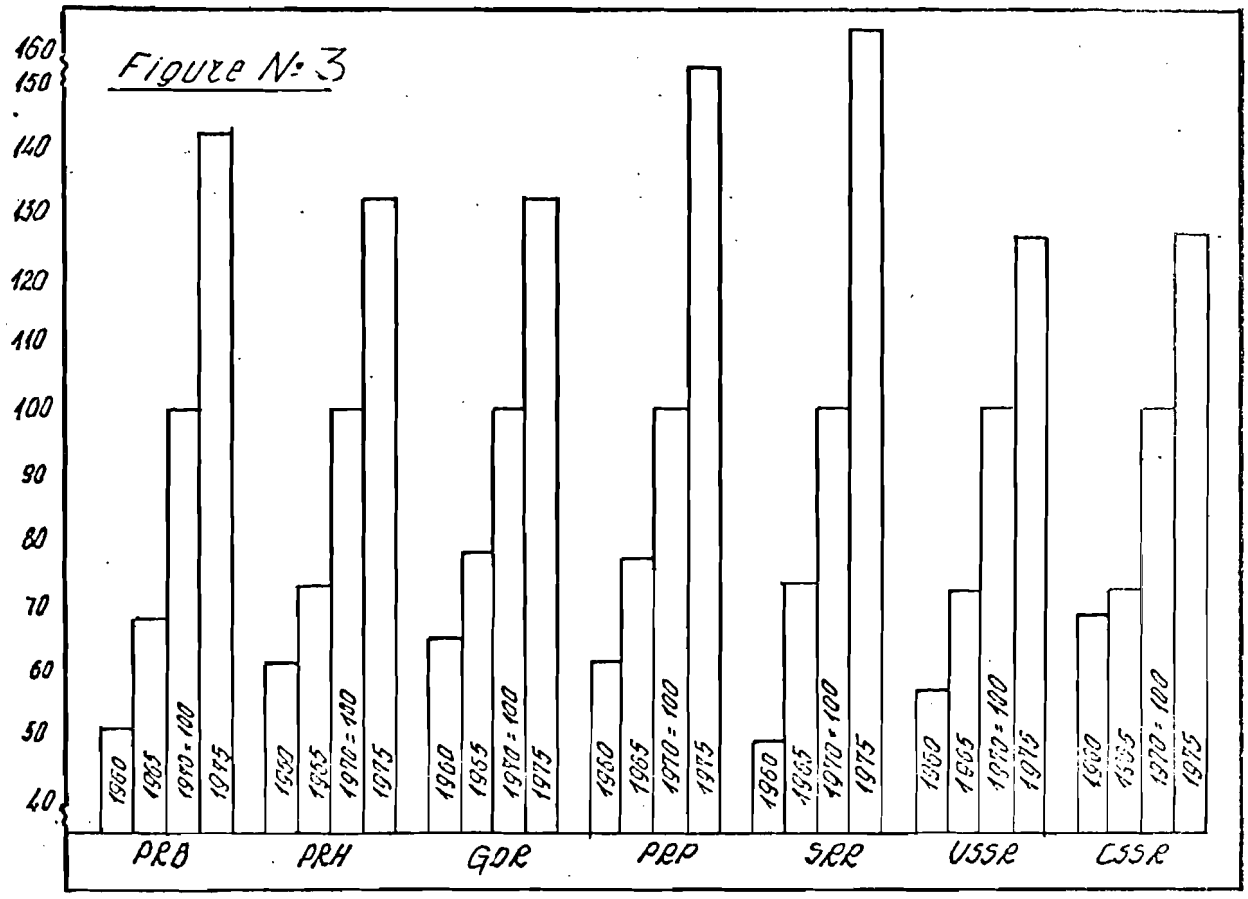
During the period 1960-1975, foreign trade turnover in these countries increased from 23,900 million roubles to 120,010 million roubles, or fivefold, (current price). In 1975, the USSR's foreign trade turnover reached 50,699 million roubles, Poland's 17,057 million, the GDR's 15,930 million, the CSSR - 12,171 million, Romania, Bulgaria and Hungary, which have a lower foreign trade turnover, below 10,000 million roubles, have recorded a much more rapid rate of growth. Romania increased its turnover 6.5 times, Bulgaria 6.9 times, and Hungary 5.3 times.

The dynamics of this development show that after 1970 the most rapid foreign trade turnover developed in Poland and Romania. However, over the whole period the most rapid turnover developed in Bulgaria, Romania and Hungary. (See Figure 4)

Another characteristic feature of foreign trade policy in most countries is that two different, and in a number of cases opposing, tendencies are shown in the foreign trade turnover at the beginning and at the end of the investigated period. During the first and second five-year-plan periods (1961-1965 and 1966-1970), for example, in Bulgaria, Hungary and the USSR exports developed more rapidly than imports, while in the third period (1971-1975) imports exceeded exports.

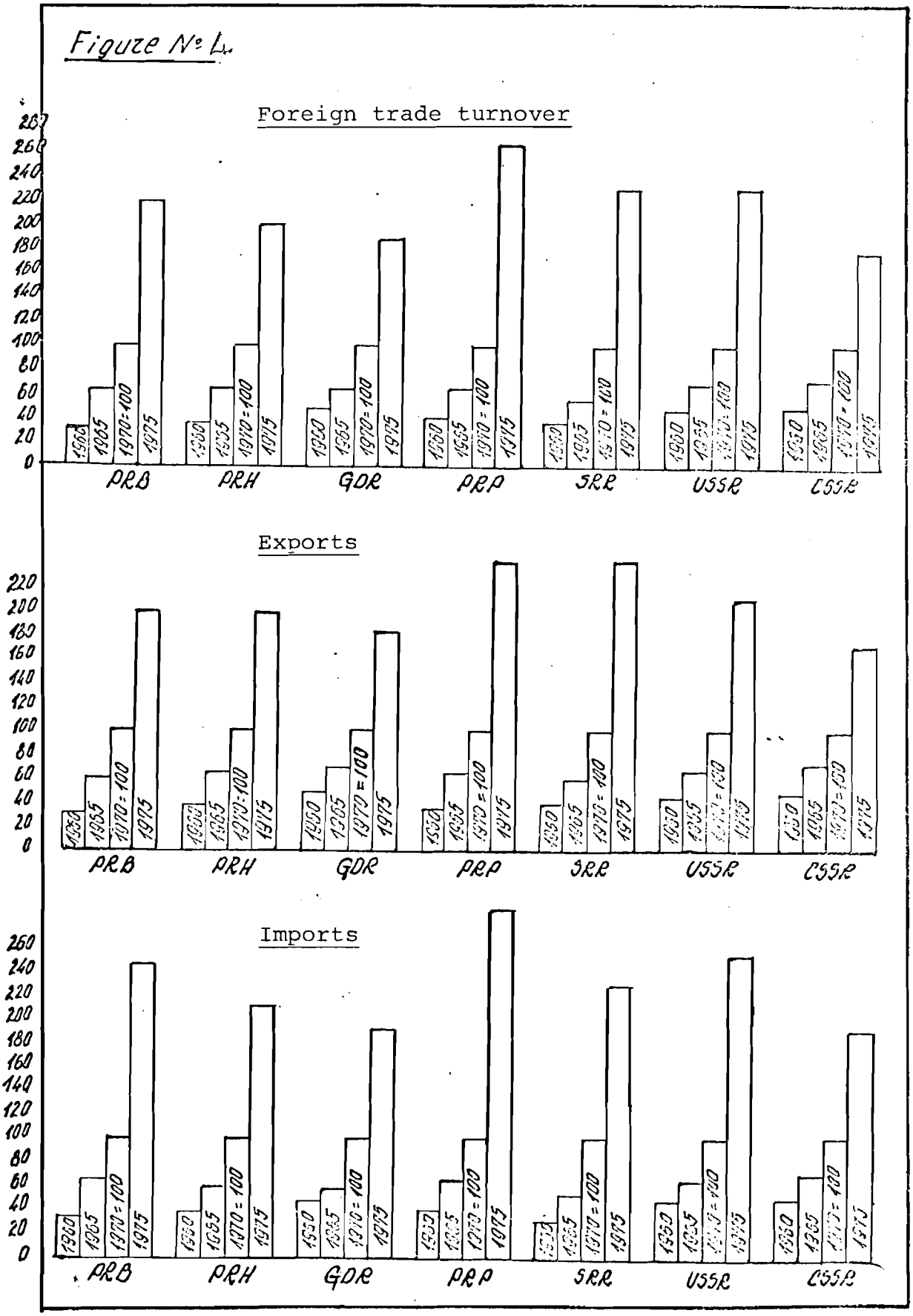
At the same time, in other countries, e.g. Romania, imports developed more rapidly than exports during the periods 1961-1965 and 1966-1970, but decreased between 1971-1975.

INDICES OF THE VOLUME OF NATIONAL INCOME PRODUCE PER CAPITA (1970 = 100)



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 16

INDICES OF VOLUME OF FOREIGN TRADE (1970 = 100)



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 111

However, the diverse tendencies in foreign trade development in the various years, and the differences between the individual countries in the same years, are not a product of fundamental discrepancies in their foreign trade strategies. Nor are they due to changes in the concept of their foreign trade policy, as all Community countries pursue a foreign trade policy of balanced (over a long-term period) export and import. These discrepancies are conditioned, primarily, by the circumstances that govern the solution of different basic economic tasks of the individual countries at varying times. In particular, this applies to the task of modernizing and reconstructing the industrial capacities of the main production funds. The individual countries' pursuit of wider foreign economic relations with the other socialist and non-socialist countries, has also been an important factor. Another reason for the higher import figures in 1975 was the considerable deliveries of wheat and fodder crops for the USSR.

CMEA member countries' foreign trade turnover is carried out with all countries of the world, independent of their economic, social and political systems, but primarily with the socialist countries from Europe, Asia and Latin America.

Bulgaria and Czechoslovakia are most closely connected with the international socialist market. In 1975, 75.8% of Bulgaria's foreign trade was with the socialist countries, as was 70.6% of Czechoslovakia's foreign trade. For the remainder of the European socialist countries this percentage varies from 69.7 for the GDR to 44.8 for Romania.

The inter-Community foreign trade turnover is highly developed and of considerable volume. A very small part of their foreign trade is conducted with the socialist countries that are not members of this organization. Much of this trade turnover is also with developed market economies. It constitutes between 22% and 36%. The highest percentage belongs to Poland, which in 1975 carried out 41.3% of its foreign trade with the developed market economies. The lowest belongs to Bulgaria, which in the same year decreased this percentage to 17%. In all of the countries the import percentage share from developed market economies was larger than the export to these countries. Poland and Romania had high import percentages, 49.3 and 41.9 respectively. For the USSR, Hungary, the GDR, and the CSSR, imports from developed market economies varied between 24.6% and 36.4% of the total, which is higher than the corresponding share of their exports. Even in Bulgaria, where the export to the developed market economies was only 9.3% of its total exports, the import percentage share from these countries reached 23.6% of its total national import.

The Community countries export and import ties with the developed market economies show that in spite of the consistent policy of further international socialist integration, individual countries and the CMEA itself have not become an isolated regional group. Their individual economies as well as of the Community as a whole are open to wide foreign trade relations, and foreign economic relations in general. These connections are favorable for production expansion, the new industrial

branches development, for further national production specialization, for the periodic reconstruction and modernization, for the concentration of production funds, and for the systematic rise in living standards and growing purchasing power.

Some of the CMEA countries' chronically passive foreign trade balance with developed European markets economies has become an obstacle for further foreign trade development between the two groups. This is because the growing imports of the socialist countries require payment in western currency or new credits, which are not a typical feature of the CMEA members' foreign trade policy.

European socialist countries' foreign trade turnover with developing countries is comparatively small. At the end of the last five-year-plan period it varied between 4.4% and 7.2% of the national foreign trade turnover. Only Romania's and the USSR's turnover are greater, 18.5% and 12.4% respectively. In most of the European socialist countries, the export to developing countries exceeds the import percentage share. In recent years, however, some of these countries have had more imports than exports from the developing countries. For example, in 1974 the GDR's imports exceeded its exports by nearly 50%.

During the last three five-year periods in almost all of the export commodity structures of the European socialist countries, the percentage share of machines, equipment and means of transportation have greatly increased. The proportion of exports of raw materials, processed products (non-foods), raw materials for foodstuff production and foodstuffs was considerable. This was particularly large for Bulgaria, Hungary, Romania, and Poland. Although the exports of these kinds of goods decreased in 1975, in comparison with the 1960 figures, it was still 33.8% in Bulgaria, 22.6% in Romania, 25.2% in Hungary, and 14.1% in the USSR.

As for the import percentage share of raw materials, processed products (non-food), materials for foodstuff production and foodstuffs, the percentage share of national imports decreased in almost all of the countries during the same period. In spite of this, in 1975 it was still high: in the GDR, 22.6%; in the CSSR, 17.4%; in Hungary, 19.0%; in Bulgaria, 12.7%; and in Romania,15.6%. Only in the USSR did the import percentage share increase from 23.7% in 1960 to 29.1% in 1975.

The foreign trade turnover in European CMEA countries has had an important influence on their agricultural production and food industry. It has contributed to the expansion of an international division of labor among the separate member countries, and also with countries that have different socio-economic systems. It has also led to intensification, specialization and concentration of production in the individual countries and the regions of the world, which has had a favorable influence on foreign trade development in food and agricultural goods.

Through the channels of foreign trade, European socialist countries have purchased a part of the technical and chemical means necessary for their agricultural production, sowing and stock breeding material, etc. These means of production, which are of primary importance to modern agriculture, are also exchanged between the individual socialist countries and between socialist and developed market economies and developing countries.

The developing foreign trade has also created new conditions for European socialist countries to export a part of their technical equipment, expertise, chemicals and surplus food products. This has encouraged further development of certain products for which optimal conditions exist, thus fully utilizing the present natural and economic conditions.

The scale and rate of the development in foreign trade turnover, together with its significant structural changes, influence agricultural production and food economy within the individual countries as well as within some of the countries linked through international markets. Production specialization and more advanced technology has raised the agricultural production and expanded the volume and range of the food industry. The export of some foodstuffs has also increased. The CMEA member countries have paid great attention to the specialization of agricultural production that took place in the mid 1960s; this included specialization in machine building, fertilizers, pesticides, and agricultural production. Thus optimal natural and economic conditions have been utilized to create high quality goods with the minimum of expenditure. This development gave considerable impetus to the expansion of their foreign trade turnover.

The structure of national production in the individual countries, however, determines some peculiarities of this trade.

Bulgaria developed its agricultural machine-building and chemical export trade entirely within the investigated period. In comparison with 1960, it increased the export of tractors, agricultural machines and farm implements 18.6 times (in million roubles) in 1975, and the value of agricultural machinery has correspondingly been increased 17.8 times[6] (See Table 1) The export of nitrogenous fertilizers, in N_2 equivalent, increased by 6.8 times and of pesticides from 6 tons to 13,895 tons. Equipment for the food industry also underwent a rapid and significant development during this period, and increased 19.2 times.

During the investigated period rather substantial changes were obvious in the national export structure. The percentage share of exported raw materials and manufactured products (non-food), raw materials, foodstuffs production and foodstuffs

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[6] The CMEA statistics distinguish between (a) tractors, agricultural machinery and farm implements, and (b) agricultural machinery.

Table 1: Bulgaria

EXPORT AND IMPORT OF INDIVIDUAL COMMODITIES

Commodities	Export				Import			
	1960	1965	1970	1975	1960	1965	1970	1975
Food industry equipment, million roubles	0.9	2.9	7.4	17.3	5.5	14.0	11.2	42.5
Tractors, agricultural machinery, and farm implements, million roubles	6.6	34.9	73.5	123.0	29.6	32.8	44.3	119.0
Tractors and self propelled chassis, incl. unassembled tractors, units	—	1005.0	2280.0	4366.0	5231.0	3272.0	1822.0	6463.0
Agricultural machinery, million roubles	5.8	31.3	63.5	103.2	15.7	13.4	17.1	71.3
Nitrogenous fertilizer (in N_2 equivalent) thousand tons	7.1	18.4	30.3	48.3	—	—	—	—
Phosphorous fertilizer (in P_2O_5 equivalent) thousand tons	—	—	—	—	10.6	42.0	99.8	38.8
Potash fertilizer (in K_2O equivalent) thousand tons	—	—	—	—	5.8	10.6	24.5	50.8
Agricultural pesticides, tons	6.0	55.0	12350.0	13895.0	6442.0	10043.0	11889.0	14354.0
Feeding cake and coarse meal, milling waste, thousand tons	—	—	—	—	—	70.9	90.8	218
Grains (including groats), thousand tons	174.0	73.8	462.0	195.0	154.0	358.0	158.0	653.0
Wheat, thousand tons	32.8	9.5	211.0	113.0	136.0	149.0	52.1	105.0
Maize, thousand tons	137.0	43.4	250.0	81.9	9.8	28.7	—	222.0
Barley, thousand tons	—	1.1	—	—	0.8	133.0	106.0	278.0
Rye, thousand tons	—	—	—	—	—	—	—	—
Oil seed and products for industrial purposes, tons	96025	95669	117210	692.0	563.0	2394.0	20751.0	2596.0
Tobacco (raw) tons	70989	82004	58261	71230.0	492.0	103.0	4643.0	8705.0
Meat and meat products, thousand tons	32.4	42.9	64.6	98.8	15.2	18.6	16.1	18.9
Fish and fish products, thousand tons	0.1	1.8	28.1	30.8	7.3	11.7	4.5	1.2
Butter, thousand tons	2.6	2.7	2.5	2.3	—	—	—	—
Eggs in shell, millions	437.0	508.0	491.0	439.0	—	—	88.6	95.5
Fresh vegetables, including glasshouse produce, thousand tons	247.0	194.0	201.0	184.0	—	—	—	—
Tomatoes, incl. glasshouse tomatoes, thousand tons	212.0	172.0	136.0	104.0	—	—	—	—
Packaged vegetables, thousand tons	76.0	132.0	215.0	253.0	—	—	—	—
Fresh fruits and berries, thousand tons	129.0	347.0	245.0	159.0	3.2	8.3	15.1	32.4
Fresh grapes, thousand tons	77.0	260.0	117.0	87.7	—	—	—	—
Processed fruit and berries, thousand tons	72.8	108.0	175.0	191.0	0.1	—	0.6	0.9
Vegetable oils, edible, thousand tons	9.4	1.4	47.2	21.2	0.9	0.6	5.1	2.5
Cocoa beans, tons	—	—	—	—	660.0	6071.0	7442.0	13344.0

Source:

Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 116

decreased from 56.4% in 1960 to 33.8% in 1975. In absolute volume, however, the national export of several agricultural and food goods increased equally rapidly. In 1975, the export of wheat increased 3.5 times, while meat and meat products rose by approximately 3 times. The quantity of exported eggs in shell at the beginning and end of the period remained at nearly the same level, although fluctuations were evident during individual years.

The main commodities exported by Bulgaria during the whole period were fresh and processed vegetables, fruit and vegetable oils. However, the quantities of exported fresh vegetables (including greenhouse produce) decreased 20%. The main reason for this lies in the reduction of field tomato production. At the same time the export of packaged vegetables (mainly canned) increased rapidly, rising in 1975 3.3 times above the 1960 level.

Exported fruit and fresh berries, despite considerable fluctuations within individual years, increased 23%. Processed fruit and berries for export also increased 2.6 times. The export of fresh grapes increased 13.9% but their quantity fluctuated under the influence of climatic conditions. During the last five-year period a considerable increase was observed in the export of edible vegetable oils - by 8.8 times. Exports of fish and fish products between 1960 and 1975 also rapidly increased.

At the same time Bulgaria quadrupled its import of tractors, agricultural machinery and implements, as well as different kinds of agricultural machines, which rose by 4.5 times. The import of phosphorous fertilizers (in P_2O_5 equivalent) increased 3.7 times and potash fertilizer (in K_2O equivalent) also rose by 8.8 times. Imports of agricultural pesticides almost equal exports.

Aiming to support a large assortment of commodities and to regulate trade balances, Bulgaria has also imported considerable plant-growing, stock-breeding, and foodstuff products, as well as feeding cake, oilseed meal, milling-waste, grain (mainly barley and maize), eggs in shell, and fish and fish products, etc.

In all these cases, however, the import volume is comparatively small and it depends on a change in the existing natural or trading conditions during the individual years. The only fairly constant imports during the last five-year period are meat and meat products; they amounted to 18.9 thousand tons. This is a 24.8% increase above the 1960 level. The import of bananas, oranges, lemons, etc., rose about 10 times.

Over the whole period Bulgaria was a large net exporter of meat and meat products, eggs, tobacco, fresh and processed fruit and vegetables, and nitrogenous fertilizers. In the 1960s it was a net exporter of oilseed and products for industrial purposes. After 1970 it became a net exporter of agricultural machinery and farm implements.

Hungary also has given priority to the export of tractors, chemicals and equipment. In 1975, the export of tractors, agricultural machinery and farm implements increased 3.3 times, and different types of agricultural machines 4.4 times. (See Table 2) The export of food processing equipment was considerable, increasing 1.9 times.

During the whole period the export of mineral fertilizers and agricultural pesticides increased, but some changes appeared in the structure of these exports. In 1975 the quantity of exported phosphorous fertilizers ceased completely, but exported nitrogenous fertilizers (in 20.5% N equivalent) increased 5.3 times; the agricultural pesticide exports increased 2.9 times.

In Hungary, changes in the national export structure were insignificant during the investigated period. The percentage share of raw materials and processed products (non-food), raw materials for foodstuff production and foodstuffs decreased slightly from 27.4% to 25.2%. However in absolute terms, the export volume of Hungary's agricultural equipment and food rose; for certain goods the increase was considerable, for example, meat and meat products - 5 times, eggs in shell - 3.6 times.

During recent years, Hungary has rapidly developed the production of eggs for breeding purposes; these are more valuable than eggs produced for consumption. Therefore the indicator "number of exported eggs" does not adequately reflect the importance of this product in the national export structure.

The export quantities of oilseed and produce for industrial purposes increased 51.96% in 1975, but fluctuated considerably during individual years depending on the size of the yield and the international market situation.

Hungary also exports large quantities of feeding cake and coarse-meal, and milling-waste. These increased approximately 7 times over the 15-year period. Because Hungary was able to take advantage of the favorable market situation to export considerable quantities of grain, in 1975 overall grain exports rose 33.5 times above the 1960 level; wheat and maize exports rose 41 times and 23.6 times respectively.

Total fruit and berry exports rose steadily between 1960 and 1975; fresh produce by 7.1 times the 1960 level (although in the isolated case of fresh grapes, exports decreased 4 times), and processed fruit increased approximately 5 times. At the same time exports of fresh vegetables fell - by 31.9% - yet there was a sixfold increase in the export of processed vegetables. Finally, a severe reduction in sugar exports was evident towards the end of the period.

The most marked structural changes in Hungarian trade are evident in the area of imports over the 15-year period. However,

Table 2: Hungary

EXPORT AND IMPORT OF INDIVIDUAL COMMODITIES

Commodities	Export				Import			
	1960	1965	1970	1975	1960	1965	1970	1975
Food industry equipment, million roubles	39.4	29.0	52.7	73.9	11.5	17.3	30.6	72.8
Tractors, agricultural machinery, and farm implements, million roubles	25.4	16.7	23.2	83.8	35.5	58.0	60.6	150.8
Tractors and self propelled chassis, incl. unassembled tractors, units	1497.0	846.0	380.0	—	8535.0	6035.0	4876.0	7173.0
Agricultural machinery, million roubles	17.2	7.0	15.9	76.2	20.0	24.9	36.3	112.6
Nitrogenous fertilizer (in 20.5% N_2 equival.) thousand tons	29.7	193.0	33.3	72.0	150.0	189.0	155.0	76.8
Phosphorous fertilizer (in 18% P_2O_5 equival.) thousand tons	34.3	67.1	6.0		120.0	107.0	407.0	678.0
Potash fertilizer (in 40% K_2O equivalent) thousand tons	—	—	—	—	74.9	188.0	605.0	1374.0
Agricultural pesticides, tons	852.0	1311.0	2873.0	2438.0	2934.0	9823.0	18057	30967
Feeding cake and coarse meal, milling waste, thousand tons	23.2	37.2	40.9	163.0	36.6	221.0	341.0	505.0
Grains (including groats), thousand tons	38.4	169.0	810.0	1285.0	340.0	663.0	181.0	172.0
Wheat, thousand tons	23.3	95.8	571.0	952.0	298.0	208.0	156.0	29.8
Maize, thousand tons	13.5	70.1	180.0	319.0	40.5	70.1	0.0	0.1
Barley, thousand tons	—	—	—	—	1.0	382.0	23.3	101.0
Rye, thousand tons	—	—	—	—	—	—	—	—
Oil seed and products for industrial purposes, tons	29462	13486	42476	44770	65322	44379	38254	2346
Tobacco (raw) tons	6461	9503	8659	1131	4634	7690	7572	8282
Meat and meat products, thousand tons	51.7	124.0	123.0	249.0	25.2	38.4	61.3	11.9
Fish and fish products, thousand tons	—	—	—	—	1.7	1.7	3.1	5.3
Butter, thousand tons	5.7	5.9	3.8	3.0	2.1	5.7	6.6	6.3
Eggs in shell, millions	118.0	344.0	390.0	420.0	—	19.9	—	0.5
Fresh vegetables, including glasshouse produce, thousand tons	92.2	113.0	60.6	62.8	0.2	0.8	13.1	5.4
Tomatoes, incl. glasshouse tomatoes, thousand tons	23.1	26.7	7.1	2.8	0.2	—	1.4	2.5
Packaged vegetables, thousand tons	47.4	151.0	220.0	289.0	2.2	2.7	2.1	3.7
Fresh fruits and berries, thousand tons	55.8	200.0	327.0	399.0	19.1	34.9	79.0	79.5
Fresh grapes, thousand tons	9.3	13.0	5.8	2.3	0.0	0.5	3.6	2.8
Processed fruit and berries, thousand tons	18.4	42.1	79.5	91.7	3.3	3.0	8.4	12.8
Vegetable oils, edible, thousand tons	29.4	29.0	30.3	37.6	9.2	18.6	12.1	16.9
Cocoa beans, tons	—	—	—	—	4062.0	12522	11280	14313
Refined sugar, thousand tons	136.0	91.6	20.7	6.8	27.8	32.0	34.1	183.0
Coffee, tons	—	—	—	—	3313.0	12638	25442	32692

Source:

Статистический ежегодник стран-членов СЭВ, М., Изд. Статистика, 1976, табл.116

a decrease in the import of raw materials, processed products (non-food), raw materials for the food industry and foodstuffs took place over the studied period - from 29.2% to 19%.

The import of industrial goods connected with agriculture consists mainly of tractors, equipment, chemicals. During the entire 15-year period, tractors, agricultural machines, and implements occupied the largest share of the import trade, increasing 4.2 times from the 1960 level.

Imported phosphorous fertilizers (in P_2O_5 equivalent) have increased 5.6 times, potash fertilizers (40% K_2O equivalent content) 18 times. However, imported nitrogenous fertilizers decreased 18.3% due to a sevenfold production increase by domestic industry. The import of agricultural pesticides rose 10.6 times during the same period.

Although a large exporter of oilseed, cake, meal and milling-waste, Hungary imports considerable quantities of these goods for its livestock and fodder industries. In 1975 this import amounted to 13.8 times more than in 1960. During the 1960s considerable quantities of meat for direct consumption and also for the meat processing industry were imported. But in the period from 1971-1975 as a result of the sharp increase in national output, there has been a considerable fall in imports. The import of fish and fish products has increased fairly constantly, rising in 1975 3.1 times above the 1960 level. During the last few years Hungary has imported great quanitites of fresh and processed fruit; with an increase of 4.2 times for fresh fruit and 3.9 times for processed fruit. It is a major importer of sugar, purchasing 6.6 times more than in 1960.

As a result of all these changes and the increased national production of some food stuffs and related products, over the whole period this country was able to achieve a net export of: food industry equipment, meat and meat products, eggs, fresh and processed fruit and vegetables and vegetable oils.

In the period 1961-70 it was also a net exporter of tobacco, but during the last five-year period the imports of this commodity exceeded exports. The same situation is evident for foreign trade in sugar.

After 1970 Hungary became a large net exporter of grain (wheat and maize), and oilseed and products for industrial purposes.

Over the 15-year period it was a net importer of tractors and self-propelled chassis, agricultural machinery and implements, phosphorous and potash fertilizers, agricultural pesticides, feeding cake and coarse meal, and milling waste.

The German Democratic Republic is an active participant in the foreign trade turnover between the socialist countries. (See Table 3)

In 1975 the volume of exported tractors, agricultural machinery, and farm implements increased sharply, achieving a net export volume. The monetary value of other exported agricultural machinery during this period increased more rapidly - by 16.9 times. Exported food industry equipment also rose - by 3 times. The GDR is a major exporter of potash fertilizers. The quantity of these fertilizers (in K_2O equivalent) increased approximately 2.2 times over the 1960 level, and agricultural pesticides also increased during the same period 3.8 times.

Over the last few years the country has exported considerable quantities of eggs in shell - 17 times more than in 1960, fish and fish products - 8 times, and some fresh vegetables (including those grown under glass). However, in 1975 vegetable exports decreased considerably.

The structure of the GDR's national export trade during the investigated period did not show any significant changes. The share of exported raw materials and processed products (non-food), raw materials for foodstuff production and foodstuffs increased from 5.9% to 9.1%.

In contrast the structure of the national import trade in the GDR during this period changed substantially. The percentage share of imported raw materials and processed products (non-food), raw materials for foodstuff production and foodstuffs decreased from 39.2% to 22.6%. The quantity of imported grain during the last few years has varied, but in 1975 it was 1.5 times more than in 1960. At the same time, there were considerable changes in the structure of this import. Imported wheat decreased, but imported maize increased over 13 times, and imported barley also increased - 3.4 times. The quantity of imported cake, oil-seed and milling-waste increased extremely quickly - by 11.7 times. The import of processed vegetables and processed fruit increased 4.3 times and 2.4 times respectively.

A constant and clearly expressed tendency of import growth is evident in the import of fresh fruit, which rose by 2.8 times, including fresh grapes - approximately 2 times.

Because of increased national production, the import of fresh vegetables, including glasshouse varieties, has fluctuated in the last 5 years, but these fluctuations have averaged out at the level achieved in 1960 - field and greenhouse tomatoes are included in this group.

International division of labor within the framework of the CMEA, and the specialization of the different member countries in the production of agricultural techniques and machines has been the reason for the GDR's increasing import of some types

Table 3: The G.D.R.

EXPORT AND IMPORT OF INDIVIDUAL COMMODITIES

Commodities	Export				Import			
	1960	1965	1970	1975	1960	1965	1970	1975
Food industry equipment, million roubles	34.1	37.1	55.9	90.2	1.5	4.8	18.8	55.9
Tractors, agricultural machinery, and farm implements, million roubles	23.5	86.8	148.0	298.0	13.4	36.1	52.1	117.0
Tractors and self propelled chassis, incl. unassembled tractors, units	3275.0	6995.0	6382.0	283.0	4150.0	3571.0	4874.0	7216.0
Agricultural machinery, million roubles	16.9	68.6	88.2	286.0	1.7	5.7	15.4	52.5
Nitrogenous fertilizer (in N_2 equivalent) thousand tons	—	—	—	—	27.8	135.0	160.0	112.0
Phosphorous fertilizer (in P_2O_5 equivalent) thousand tons	—	—	—	—	59.1	88.1	24.3	32.3
Potash fertilizer (in K_2O equivalent) thousand tons	1092.0	1292.0	1739.0	2252.0	—	—	—	—
Agricultural pesticides, tons	12.2	19.8	27.8	46.1	—	0.5	6.3	17.4
Feeding cake and coarse meal, milling waste, thousand tons	—	—	—	—	74.5	199.0	522.0	875.0
Grains (including groats), thousand tons	—	—	—	—	2200.0	1733.0	3424.0	3360.0
Wheat, thousand tons	—	—	—	—	1520.0	1225.0	2084.0	1130.0
Maize, thousand tons	—	—	—	—	137.0	168.0	376.0	1795.0
Barley, thousand tons	—	—	—	—	116.0	289.0	799.0	390.0
Rye, thousand tons	—	—	—	—	234.0	1.1	132.0	
Oil seed and products for industrial purposes, thousand tons	—	—	—	—	282.0	141.0	203.0	124.0
Tobacco (raw) tons	—	—	—	—	25467	27770	15679	16690
Meat and meat products, thousand tons	—	—	—	—	97.0	76.6	84.8	23.8
Fish and fish products, thousand tons	0.8	0.8	3.9	6.4	25.5	14.9	11.3	12.6
Butter, thousand tons								
Eggs in shell, millions	10.1	81.3	98.3	171.0	—	—	—	—
Fresh vegetables, including glasshouse produce, thousand tons	17.8	10.0	13.2	9.8	116.0	88.6	115.0	129.0
Tomatoes, incl. glasshouse tomatoes, thousand tons	—	—	—	—	51.3	44.1	48.4	47.4
Packaged vegetables, thousand tons	0.0	0.1	0.5	1.6	28.6	57.4	98.1	123.0
Fresh fruits and berries, thousand tons	0.1	—	8.1	—	171.0	270.0	337.0	487.0
Fresh grapes, thousand tons	—	—	—	—	17.0	44.5	25.4	33.2
Processed fruit and berries, thousand tons	—	—	—	—	47.7	49.2	68.4	116.0
Vegetable oils, edible, thousand tons	—	—	—	—	110.0	106.0	117.0	95.4
Cocoa beans, tons	—	—	—	—	12438	15341	19487	23401
Coffee (natural), tons	—	—	—	—	23245	35825	45364	48851

Source:

Статистический ежегодник стран-членов СЭВ, Изд, Статистика, М., 1976, табл.116

of tractors, agricultural machines, and food industry equipment. Therefore the volume of imported tractors, agricultural machines and farm implements increased approximately 9 times. The import of food industry equipment also rose quickly.

The quantities of imported nitrogenous fertilizers (N_2 equivalent) during the same period increased 4 times. Imported quantities of phosphorous fertilizers (P_2O_5 equivalent) decreased 45.35%, because of the increased national production of these fertilizers - by 2.6 times. The import of agricultural pesticides also increased significantly.

Over the whole period the GDR was a net exporter of food industry equipment, agricultural machinery and farm implements, potash fertilizers, agricultural pesticides and eggs.

During the same period this country was a net importer of tractors and self-propelled chassis, nitrogenous and phosphorous fertilizers, grain (wheat, maize, barley and rye), fresh and processed vegetables and fruit, fish and fish products, feeding cake and coarse meal, and milling waste, oilseed and products for industrial purposes and tobacco.

A steady import increase is only evident for the following commodities: feeding cake and coarse meal, and milling waste, maize, processed vegetables and fresh and processed fruit.

For the other commodities, import quantities decreased due to greater national production. This applies particularly to meat and meat products, imports which reflect the national policy goal, greater production ultimately aiming at national self-sufficiency

Poland, during the investigated period, has increased the export of tractors and farm implements 17 times, and agricultural machines 23 times. (See Table 4) In 1975 there was a rapid increase in exported food industry equipment, when it rose 4 times above the 1960 level.

In 1960 the quantities of exported nitrogenous fertilizers (in N_2 equivalent) were extremely small, but during the last few years they have risen considerably.

Poland is also a major exporter of refined sugar. However its quantities vary a great deal annually. During the last five-year-plan period, exports of sugar fluctuated and decreased. From 1960 to 1975 exports of meat and meat products have doubled, but fish and fish products have shown the most rapid growth - 13.7 times above the 1960 level. Constant growth can be observed for exported processed fruit. Quantities in 1975 had increased more than 40 times, the greatest proportion belonging to apples and plums. For these fruits the cultivation conditions are particularly good. The export of fresh vegetables shows variations from year to year, depending on the size of the yield and the international market. During the last five-year period, the general trend has indicated a decrease in these goods.

Table 4: Poland

EXPORT AND IMPORT OF INDIVIDUAL COMMODITIES

Commodities	Export				Import			
	1960	1965	1970	1975	1960	1965	1970	1975
Food industry equipment, million roubles	16.5	10.9	26.5	64.3	10.0	5.9	11.9	154.0
Tractors, agricultural machinery, and farm implements, million roubles	7.0	17.5	36.0	120.0	22.1	59.0	69.5	191.0
Tractors and self propelled chassis, incl. unassembled tractors, units	1120.0	2006.0	12652	18013	5555.0	7986.0	1650.0	3384.0
Agricultural machinery, million roubles	3.1	11.4	23.4	71.3	5.4	17.3	29.0	117.0
Nitrogenous fertilizer (in N_2 equivalent) thousand tons	3.6	9.1	46.9	361.0	15.2	56.9	—	0
Phosphorous fertilizer (in P_2O_5 equivalent) thousand tons	3.4	—	—	—	...	...	...	—
Potash fertilizer (in K_2O equivalent) thousand tons	—	—	—	—	317.0	523.0	1144.0	1600.0
Agricultural pesticides, tons	682.0	48897	8845	12077	14685	42005	6091	14614
Feeding cake and coarse meal, milling waste, thousand tons	2.2	17.0	15.5	4.3	136.0	161.0	313.0	948.0
Grains (including groats), thousand tons	89.3	56.9	200.0	104.0	2122.0	2714.0	2484.0	3963.0
Wheat, thousand tons	—	—	—	—	1700.0	1378.0	1099.0	1477.0
Maize, thousand tons	—	—	—	—	46.1	785.0	231.0	634.0
Barley, thousand tons	81.8	56.9	144.0	29.1	231.0	485.0	1093.0	1376.0
Rye, thousand tons	—	—	38.7	70.4	109.0	—	55.8	69.4
Oil seed and products for industrial purposes, thousand tons	1.6	62.8	46.0	76.0	90.7	144.0	82.3	134.0
Tobacco (raw) tons	3728.0	2496.0	9636.0	10457	11797	16550	3544.0	10081
Meat and meat products, thousand tons	110.0	197.0	157.0	209.0	18.1	39.4	44.5	16.0
Fish and fish products, thousand tons	6.9	28.3	59.0	94.3	31.4	21.0	14.6	54.8
Butter, thousand tons	28.6	18.3	12.6	15.3	0.3	2.4	12.8	
Eggs in shell, millions	972.0	751.0	403.0	492.0	—	—	—	—
Fresh vegetables, including glasshouse produce, thousand tons	37.0	93.0	66.1	1.5	16.4	37.2	21.4	63.1
Tomatoes, incl. glasshouse tomatoes, thousand tons	—	—	—	—	16.0	36.5	17.6	...
Packaged vegetables, thousand tons	12.6	28.8	43.8	29.9	0.9	3.3	6.9	11.1
Fresh fruits and berries, thousand tons	32.2	13.0	24.5	48.3	45.3	137.0	116.0	196.0
Fresh grapes, thousand tons	—	—	—	—	11.8	39.6	19.2	23.4
Processed fruit and berries, thousand tons	0.8	2.1	15.5	32.1	0.1	0.0	3.0	18.3
Vegetable oils, edible, thousand tons	—	11.6	37.6	57.2	42.7	32.1	42.0	60.6
Cocoa beans, tons	—	—	—	—	10827	17299	14306	36803
Refined sugar, thousand tons	244.0	383.0	172.0	67.0	12.9	—	11.9	12.7
Coffee, tons	—	—	—	—	3893.0	15379	34475	30882

Source:

Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976 табл 116

Over the whole period, this country was a net exporter of meat and meat products, eggs, processed vegetables, fruit and berries, and sugar. In the last few years, it also achieved a net export of tractors and self-propelled chassis, nitrogenous fertilizers and fish and fish products.

Some considerable changes have appeared in the structure of the national export trade over the 15-year period. The percentage share of exported raw materials, processed products (non-food), raw materials for foodstuff production, and foodstuffs decreased from 23% to 10.5%.

Significant changes have also occurred in the import trade structure. A reduction in the percentage share of raw materials, processed products (non-food), raw materials for foodstuff production, and foodstuffs is evident - from 33.9% to 17.7%.

Poland is a major importer of some food and agricultural production means. The volume of imported tractors, agricultural machinery and farm implements has increased rapidly - by 8.6 times above the 1960 level. The import growth of food industry equipment has also been rapid - 15.4 times. Import of mineral fertilizers are confined principally to the potash variety, since domestic demand for phosphorous and nitrogenous fertilizers is satisfied. The volume of imported potash fertilizers (in K_2O equivalent) has increased 5 times. Imported agricultural pesticides increased considerably in the 1961-1965 period, but they have decreased in the last few years; this is partly because of the doubling of national output. However, this does not account for the decrease in all imports, and as a result fewer pesticides have been used during the last few years.

This country imported a large quantity of grain, mainly wheat, but more recently a rising volume of barley, corn-maize and cake-meal. By 1975 the quantity of imported grain has risen 2 times above the 1960 level. There has been a tendency towards a constant increase in imported quantities of oil-seeds,cake, and milling-waste. In 1975 milling-waste imports were 7 times greater than at the beginning of the period, and oil-seed imports increased approximate 1.5 times. This latter increase can be explained by two factors: firstly, the need for extra forage as a result of animal husbandry development, secondly because of the development of vegetable oil production.

At the beginning of the investigated period a large quantity of meat and meat products were imported, reaching a peak in 1970, but during the last 5 years they have sharply decreased.

Over the 15 year period Poland was a net importer of agricultural machinery and farm implements, potash fertilizers, feeding and coarse meal, and milling waste, grain (wheat, maize and barley), oilseed and products for industrial purposes, fresh fruit and berries and vegetable oils.

In comparison with the other centrally planned economies, Poland has the most unstable international agricultural trade structure. Export and import trends fluctuate, in many cases changing even over a two- or three-year period. The influence of natural conditions (mainly climatic), and the existing private agricultural farms both play a very important role in this case.

Although the whole system of methods of economic and administrative management have been utilized, the Polish agricultural policy has been unable to develop its food and agricultural production sufficiently to completely satisfy the increasing domestic demand.

Romania has realized a comparatively small foreign trade turnover in agricultural goods, and machines and chemicals connected with their production.

Its exports consist mainly of tractors and self-propelled chassis (including unassembled tractors), which increased in 1975 about 8 times. During the last few years, considerable quantities of nitrogenous and some phosphorous fertilizers have been exported. (See Table 5)

The changes in the national export structure in Romania are significant. The percentage share of exported raw materials and processed products (non-food), raw materials for foodstuff production,and foodstuffs decreased from 35.9% to 22.6%. However, as in the other CMEA member countries, the reduced percentage share of exported food and agricultural goods does not signify a reduction in their export volume. The export of wheat has been greatest during the last 5-year-plan period, when international market conditions for this crop have been the most favorable. The quantity of exported maize during the same period was also rather large, although smaller than during the preceding five-year-plan period.

From 1960 to 1975 Romania has increased the export of meat and meat products 3 times, and egg in shell exports by 3.3 times. The export of fresh vegetables, including greenhouse varieties has followed a rather constant trend of growth, increasing approximately 6 times between 1960 and 1975. The main contribution belongs to the increased export of tomatoes (including greenhouse varieties) which at the same time rose 7.3 times. The export of fresh fruit has also increased 1.7 times. However, this was mainly achieved during the decade 1961-1970 and the volume has remained relatively static since 1970.

Over the last five-year-plan period Romania has increased exports of vegetable oils at a constant rate. In 1975, they rose 4.4 times above the 1960 level.

The national import trade structure has not altered significantly. The percentage share of imported raw materials and processed products (non-food), raw materials for foodstuff

Table 5: Romania

EXPORT AND IMPORT OF INDIVIDUAL COMMODITIES

Commodities	Export				Import			
	1960	1965	1970	1975	1960	1965	1970	1975
Food industry equipment, million roubles	—	—	—	—	—	—	—	—
Tractors, agricultural machinery, and farm implements, million roubles	—	—	—	—	—	—	—	—
Tractors and self propelled chassis, incl. unassembled tractors, units	4526.0	3405.0	13475	35714	394.0	198.0	119.0	42.0
Agricultural machinery, million roubles	—	—	—	—	—	—	—	—
Nitrogenous fertilizer (in N_2 equivalent) thousand tons	—	2.9	216.0	500.0	—	—	—	—
Phosphorous fertilizer (in P_2O_5 equivalent) thousand tons	—	—	2.9	68.9	—	—	—	—
Potash fertilizer (in K_2O equivalent) thousand tons	—	—	—	—	4.0	13.3	29.9	91.9
Agricultural pesticides, tons	—	—	—	—	7410.0	3261.0	5751.0	13542
Feeding cake and coarse meal, milling waste, thousand tons	—	—	—	—	—	—	—	—
Grains (including groats), thousand tons								
Wheat, thousand tons	140.0	170.0	13.5	705.0	—	—	—	—
Maize, thousand tons	567.0	680.0	357.0	458.0	—	—	—	—
Barley, thousand tons	—	—	—	—	—	—	—	—
Rye, thousand tons	—	—	—	—	—	—	—	—
Oil seed and products for industrial purposes, thousand tons	—	—	—	—	—	—	—	—
Tobacco (raw) tons	6065.0	7552.0	4325.0	8629.0	—	1625.0	1822.0	1626.0
Meat and meat products, thousand tons	54.9	60.9	55.3	165.0	3.5	—	7.9	2.8
Fish and fish products thousand tons	—	—	—	—	—	—	—	—
Butter, thousand tons	2.0	6.9	13.2	8.8	—	—	—	—
Eggs in shell, millions	121.0	246.0	312.0	404.0	17.4	20.6	27.1	41.4
Fresh vegetables, including glasshouse produce, thousand tons	25.7	137.0	140.0	151.0	—	—	—	—
Tomatoes, incl. glasshouse tomatoes, thousand tons	14.6	101.0	115.0	106.0	—	—	—	—
Packaged vegetables, thousand tons	—	—	—	—	—	—	—	—
Fresh fruits and berries, thousand tons	56.4	157.0	98.6	93.8	15.9	22.0	29.2	75.8
Fresh grapes, thousand tons	—	—	—	—	—	—	—	—
Processed fruit and berries, thousand tons	—	—	—	—	—	—	—	—
Vegetable oils, edible, thousand tons	32.0	33.3	119.0	141.0	2.8	0.8	6.6	6.9
Cocoa beans, tons	—	—	—	—	1511.0	5559.0	5635.0	12710
Refined sugar, thousand tons	76.7	34.5	39.4	8.4	0.0	—	90.5	8.4
Coffee, tons	—	—	—	—	1126.0	1495.0	5886.0	10590

Source:

Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 116

production and foodstuffs decreased from 18.4% to 15.6%.

Romania has continued to develop its own tractor and agricultural machine production,which has lessened its dependence on imports. As well as limiting the import of industrial products connected with agriculture, the import of agricultural goods and foodstuffs has also been limited.

The quantity of imported meat and meat products has widely fluctuated in the individual years. Imported whole eggs in shell, fresh fruits (mainly citrus) and edible vegetable oils increased between 2.5 and 3 times.

Overall, Romania has attempted to follow a policy of self-sufficiency, and has depended less on international markets. However, it was a net exporter of tractors and self-propelled chassis, nitrogenous and potash fertilizers, grains, tobacco, eggs, meat and meat products, fresh vegetables and fruits. Rumania has remained a net importer of potash fertilizer and agricultural pesticides.

The USSR is the largest trade partner among the European CMEA member countries, with respect to exports and imports of machines and chemical means for agricultural production and food processing and also of food and foodstuffs. (See Table 6)

The greatest proportional decrease in the structure of national exports is evident for exported raw materials and processed products, raw materials for foodstuff production and foodstuffs - from 27.3% in 1960 to 14.1% in 1975. During the investigated period, the USSR has increased the export of food industry equipment considerably. The greatest volume, however, belongs to the export of tractors and self-propelled chassis (including unassembled tractors), which increased 2.4 times. The number of exported grain combine-harvesters also rose - by 1.5 times and agricultural chemicals figured significantly. The export of phosphorous fertilizers increased 2.4 times, potash fertilizers, 9.5 times and nitrogenous fertilizers, 5.1 times. The export of fresh, frozen, salted and preserved fish rose steadily during this period and increased 9.5 times in 1975. The quantities of exported vegetable oils for food purposes followed a similar trend, rising by 4.5 times. Over the whole period the USSR was a net exporter of tractors and self-propelled chassis, grain combine-harvesters, nitrogenous, phosphorous and potash fertilizers, fish and fish products, and vegetable oils.

The changes in the USSR's national import structure have been much smaller. The share of imported raw materials and processed products (non-food), raw materials for foodstuff production and foodstuffs increased from 23.7% to 29.1%.

This country is the largest importer of food industry equipment. It is also a very large importer of fresh and processed fruit and vegetables. In 1975, the USSR imported 2.6 times more fresh fruit than in 1960. Imports followed an almost constant line of growth during the whole period. The import of processed and dried fruits followed a similar trend especially during the period 1961 to 1970. The volume of processed fruits increased

Table 6: The USSR

EXPORT AND IMPORT OF INDIVIDUAL COMMODITIES

Commodities	Export				Import			
	1960	1965	1970	1975	1960	1965	1970	1975
Food industry equipment, million roubles	1.4	4.4	52.2	65.6	118.0	79.6	124.0	231.0
Tractors and self propelled chassis, incl. unassembled tractors, units	18887	21867	28269	38719	—	—	—	—
Grain combine harvesters, units	3513.0	5377.0	2234.0	5297.0	—	—	—	—
Nitrogenous fertilizer[1] thousand tons	258.0	339.0	1024.0	1312.0	—	—	—	—
Phosphorous fertilizer[1] thousand tons	224.0	290.0	710.0	530.0	—	—	—	—
Potash fertilizer[1] thousand tons	629.0	826.0	3147.0	5986.0	—	—	—	—
Agricultural pesticides, tons	—	—	—	—	19.2	272.0	41.9	50.4
Feeding cake and coarse meal, milling waste, thousand tons	—	—	—	—	—	—	—	—
Grains (including groats), thousand tons	—	—	—	—	—	—	—	—
Wheat, thousand tons	—	—	—	—	—	—	—	—
Maize, thousand tons	—	—	—	—	—	—	—	—
Barley, thousand tons	—	—	—	—	—	—	—	—
Rye, thousand tons								
Oil seed and products for industrial purposes, thousand tons	—	—	—	—	418.0	157.0	43.2	424.0
Tobacco (raw) tons	—	—	—	—	74.2	104.0	70.3	87.8
Meat and meat products, thousand tons	—	—	—	—	66.9	252.0	165.0	515.0
Fish and fish products, thousand tons	51.6	185.0	244.0	491.0	86.2	47.4	38.3	26.7
Butter, thousand tons								
Eggs in shell, millions	—	—	—	—	113.0	706.0	602.0	767.0
Fresh vegetables, including glasshouse produce, thousand tons	—	—	—	—	148.0	168.0	163.0	144.0
Tomatoes, incl. glasshouse tomatoes, thousand tons	—	—	—	—	108.0	105.0	92.6	64.1
Packaged vegetables, thousand tons	—	—	—	—	40.0	128.0	249.0	322.0
Fresh fruits and berries, thousand tons	—	—	—	—	335.0	501.0	679.0	860.0
Fresh grapes, thousand tons								
Processed fruit and berries, thousand tons	—	—	—	—	64.2	72.1	207.0	177.0
Vegetable oils, edible, thousand tons	91.8	242.0	372.0	416.0	59.3	68.1	64.6	61.3
Cocoa beans	—	—	—	—	58.1	88.8	99.9	156.0
Raw sugar, thousand tons	243.0	604.0	1079.0	53.3	1468.0	2331.0	3003.0	3236.0
Coffee, tons	—	—	—	—	19.1	30.9	41.5	60.2
Dried fruits & berries	—	—	—	—	76.7	85.3	129.0	118.0

Source:

Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 116

1) Not converted to equivalent of 100 percent nutrient content.

3.2 times in 1970, although this import decreased in 1975.

The quantities of imported fresh vegetables, mainly of field and greenhouse tomatoes increased up to 1970 but thereafter decreased to the 1960 level. At the same time the quantity of imported processed vegetables increased 8 times.

The import of oilseeds and produce for industrial purposes fluctuated greatly in individual years, but in 1975 it was at almost the same level as in 1960. The same trend is also evident for edible vegetable oils. Considerable quantities of meat and meat products as well as eggs in shell were imported during the last few years. Usually this import varies between 130 and 225 thousand tons, but in 1975 it reached 515 thousand tons (1974 and 1975 were extreme years for the import of meat in the USSR). The quantity of imported eggs in shell increased 6.8 times.

Over the whole period, the USSR was a net importer of food industry equipment, oilseed, tobacco, fresh and processed vegetables and fruit, dried fruit and berries, meat and meat products, eggs, raw sugar and agricultural pesticides.

During the last five-year-plan period, the USSR imported large quantities of grain (wheat and barley). This import came mainly from non-socialist countries and was related only to 1972 and 1975 when there were unfavorable climatic conditions.

The CSSR at the beginning of the investigated period was a large net exporter of tractors and self-propelled chassis (units) and these exports continued to increase up to 1975. The volume of exported food industry equipment doubled over the whole period.

Of the mineral fertilizers, this country decreased export of nitrogenous fertilizers (in N_2 equivalent) by 25% in 1975, but pesticide exports have increased almost 4 times. (See Table 7)

No major changes have appeared in the general structure of national exports in the CSSR. The percentage share of exported raw materials, processed products (non-food), raw materials for foodstuff production and foodstuffs decreased from 10.4% to 7.2%. The CSSR exported limited quantities of agricultural products and foodstuffs, feeding cake, and milling-waste, barley and oil-seeds for industrial purposes. In comparison with 1960, exports of barley have increased 1.8 times, while exports of oilseeds have been approximately halved.

The quantities of exported fresh vegetables and processed vegetables have increased 2.4 times and 4.6 times respectively. The export of fresh fruit has doubled and processed fruit has increased by 2.4 times.

Table 7: Czechoslovakia

EXPORT AND IMPORT OF INDIVIDUAL COMMODITIES

Commodities	Export				Import			
	1960	1965	1970	1975	1960	1965	1970	1975
Food industry equipment, million roubles	36.1	23.1	22.6	72.1	4.6	10.5	34.1	42.9
Tractors, agricultural machinery, and farm implements, million roubles	43.4	61.5	60.1	125.0	37.1	96.0	99.5	200.0
Tractors and self propelled chassis, incl. unassembled tractors, units	18422	14916	18421	19608	2497.0	3275.0	4083.0	2483.0
Agricultural machinery, million roubles	4.5	8.8	18.9	52.9	23.6	72.8	64.0	147.0
Nitrogenous fertilizer (in N_2 equivalent) thousand tons	26.5	27.6	0.1	20.1	34.2	50.5	89.1	46.8
Phosphorous fertilizer (in P_2O_5 equivalent) thousand tons	—	—	—	—	152.0	333.0	407.0	32.6
Potash fertilizer (in K_2O equivalent) thousand tons	—	—	—	—	217.0	340.0	526.0	690.0
Agricultural pesticides, tons	3227.0	21117	11986	12021	1759.0	1671.0	7353.0	12991
Feeding cake and coarse meal, milling waste, thousand tons	0.0	41.4	12.9	35.4	92.5	180.0	428.0	652.0
Grains (including groats), thousand tons	80.4	24.8	61.7	73.2	2010.0	1838.0	1439.0	885.0
Wheat, thousand tons	—	—	—	—	1486.0	934.0	1026.0	515.0
Maize, thousand tons	—	—	—	—	261.0	155.0	122.0	283.0
Barley, thousand tons	25.2	18.1	54.4	47.7	63.6	641.0	139.0	82.0
Rye, thousand tons	—	—	—	—	191.0	32.1	76.0	—
Oil seed and products for industrial purposes, tons	1788.0	3913.0	3225.0	973.0	177445	186226	188219	114312
Tobacco (raw) tons	3005.0	1647.0	524.0	126.0	18357	16668	15669	13679
Meat and meat products, thousand tons	11.0	29.5	19.1	16.1	99.4	59.3	121.4	31.9
Fish and fish products, thousand tons	0.5	0.3	0.8	0.2	18.2	16.1	23.2	40.9
Butter, thousand tons	—	—	—	—	14.4	12.4	10.7	—
Eggs in shell, millions	101.0	66.2	47.0	146.0	70.5	48.0	58.1	0.0
Fresh vegetables, including glasshouse produce, thousand tons	15.1	18.2	37.8	36.5	78.3	104.0	107.0	71.0
Tomatoes, incl. glasshouse tomatoes, thousand tons	—	—	—	—	35.4	38.4	42.8	...
Packaged vegetables, thousand tons	2.9	9.1	6.8	13.3	18.5	9.1	9.9	15.0
Fresh fruits and berries, thousand tons	10.1	18.6	24.0	21.0	104.0	241.0	263.0	335.0
Fresh grapes, thousand tons	—	—	—	—	25.0	55.2	44.0	38.0
Processed fruit and berries, thousand tons	4.3	7.9	11.4	10.5	2.7	...	10.3	30.1
Vegetable oils, edible, thousand tons	8.2	3.1	0.0	0.5	34.9	39.3	49.7	48.6
Cocoa beans, tons	—	—	—	—	12555	14075	21847	21962
Coffee, tons	—	—	—	—	7964	10303	14810	21245

* or parts in equivalent measure to one tractor

Source

Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 116

The quantities of exported meat and meat products have varied considerably in individual years.

Over the whole period this country was a net exporter of tractors and self-propelled chassis; and for most years was also a net exporter of food industry equipment and eggs.

More substantial changes have appeared in the national import structure. The percentage share of imported raw materials, processed products (non-food), raw materials for foodstuff production and foodstuffs decreased from 37.1% to 17.4%.

The CSSR, being one of the most highly industrialized members of the CMEA, is essentially self-sufficient in terms of the basic industrial inputs for agricultural production. In spite of this, the import of special equipment for the food processing industry has increased 9.3 times. The import of industrial goods for agricultural production consists mainly of chemicals. Over the whole period the import of potash fertilizers (in K_2O equivalent) has increased steadily, reaching in 1975 a volume of 3.2 times above the 1960 level. During the two five-year periods (1961-1965 and 1966-1970), the CSSR imported considerable and increased quantities of phosphorous fertilizer (in P_2O_5 equivalent), but more recently, as a result of increased national production, these imports have been 4.7 times lower. Imported nitrogenous fertilizers (in N_2 equivalent) during this period have increased slightly. The import of pesticides rose considerably, increasing approximately 7 times. The quantities of imported oil-seeds for industrial purposes are large, although imports of this product showed a decrease towards the end of the 15-year period.

The quantities of imported grain decreased steadily and in 1975 were 3 times lower. The main reason for this is the reduced import of wheat. The import of maize increased 8.4% and barley by 28.93%, although the annual fluctuations for barley were greater.

The import of fresh fruit has been steadily rising. This is reflected by an increase of 3.2 times. The most rapid growth rates are shown for processed fruits. The import of fresh and processed vegetables fluctuated sharply.

The CSSR has increased imports of edible oils, despite the growth of national production.

Considerable changes are evident for animal product imports. The quantities of imported meat and meat products fluctuated greatly from 1961-1970, but over the last five-year-plan period they showed a definite downward tendency. The import of butter and eggs in shell decreased, and in 1975 petered out completely. At the same time the import of fish and fish products has increased 2.2 times.

The CSSR was a net importer over the whole period of agricultural machinery, nitrogenous, phosphorous and potash fertilizers, feeding cake and coarse meal, and milling waste, grain (wheat, maize and barley) oilseed, tobacco, meat and meat products, fish and fish products, fresh and processed vegetables, fresh fruit and vegetable oils.

The changes in the import of animal products, fruit and vegetables are the dominant feature of the CSSR's agricultural trade policy over the last few years. They reveal a tendency towards self-sufficiency in the most important animal products and some sorts of vegetables. At the same time Czechoslovakian trade has steadily swung towards an increasing import of fresh and, particularly processed fruits from the CMEA countries specializing in this produce.

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The changes in the trade volume of agricultural commodities, and especially the industrial means for this branch in the Community, testify to the presence of some common coordinated principles of policy to which these countries adhere.

The most evident feature common to all CMEA countries is the two-way trade in agricultural machinery and equipment for the food industry. Moreover, the countries that previously have had a less developed machine-building industry have recently increased the export of these products at a much more rapid rate.

The pursuit of each country towards self-sufficiency in some plant and animal products, for which favorable natural and economic conditions exist, is quite clear.

The tendency towards further production specialization and further international division of labor in food and agriculture is however evident, but the completion of this process requires more time.

The changes already achieved, in particular the trend towards foreign trade development, will have a considerable influence on the conceptions, forecasts and the models for food and agricultural development in the CMEA member countries in the following decades.

1.4 Scientific and Technical Cooperation [10,12,17,21,29,38,41,42,49,53]

International trade is one of the most important factors of international economic relations. However, it is not the only channel for utilizing the numerous possibilities for international labor distribution in the contemporary world.

Scientific and technical cooperation between various countries, and particularly between the Community countries, is one of the decisive conditions for further agriculture and food industry development in the whole Community. Section 5 of the document "Complex Program for the Extension and Improvement of Collaboration in the development of the CMEA Member Countries' Socialist Integration" (adopted by the 25th Session of the CMEA, 2 July 1971), formulates the main goals, problems, and forms of collaboration in the field of science and technology. In the sphere of agriculture and the food industry, the program envisages a joint solution to the various problems included in raising the nutritional value and yield of food products.

The problems involve the selection and creation of new high-yield, high-quality sorts and hybrids, the discovering and production of new pesticides and biological means for plant protection harmless to living organisms, accelerated mechanization, electrification and automation of production processes in plant-growing, and preservation of the environment as a basic element in the organization of every type of production activity for existence of mankind, etc.

Responsibility for the coordination and implementation of the most important topics of this program lies with many special research coordination centers. These centers, built on the basis of some of the best national research institutes, organize and carry out broad research programs with the participation of national institutes in every CMEA member country.

One coordination center specializes in the elaboration of theoretical bases for seed selection and production, and of new methods for investigation of high-yield, high-quality sorts and hybrids of agricultural crops. This center is situated in the All Union Genetics and Selection Institute in the USSR, Odessa, and it unites the efforts of scientists from 69 scientific research organizations in all the CMEA member countries.

Another coordination center studies the requirements for new complex and other mineral fertilizers, methods for their effective utilization, and their influence on soil fertility. This center is based on the Fertilizers Research Institute in Leipzig, the GDR. 51 National scientific organizations from all CMEA member countries participate in its research program.

Yet another coordination center examines the problems of mechanization, electrification and automation of production processes in plant-growing and stock-breeding. This center is at the Research Institute for Agricultural Techniques in the CSSR. Nine leading national research organizations from all the CMEA member countries participate in the 14 main scientific and technical tasks.

The joint scientific research, theoretical, methodological and practical work among these countries is closely connected to development in the Community.

The collection of plant resources in research institutes at present numbers 500 thousand patterns of agricultural crops. This collaboration contains not only resources from all the Community countries, but also global resources obtained through international collaboration and mutual exchanges. Particular attention has been paid to obtaining material from Latin America, Asia and other regions.

The greater part of this material has already been used for the creation of some of the most valuable sorts of new plants. Over 2000 valuable patterns, including hybrids developed from a crossing between wheat and rye, were collected in this fund in the first 4 years of its creation.

The use of genetic funds depends upon definite economic and biological features: height of the stem (and stability of lodging), stability against mealy mildew (manna), stability against brown rust, complex stability, etc. In the conditions of the southern regions greater importance is placed on early ripeness.

During the last five-year period about 400 new sorts and hybrids of agricultural crops that were created at the national scientific organization joint groups were examined in different research institutes of the Community. Mutual exchange of seed and planting material varieties has played an important role in the development of agriculture and has increased production of natural and processed food in all countries. The dimensions of this exchange are already considerable and they continue to develop. Between 1966 and 1970 the mutual exchange of sowing and planting material included 41 agricultural crops, and between 1971 and 1975 this number had reached 78.

The volume of these mutual exchange supplies grew very rapidly. For the group of cereal crops (with which the mutual exchange of elite sorts of materials began) the increase amounted to 43% during the last five-year periods. Only individual crops, like maize, doubled or trebled. Fruit and berries increased 10 times, seeds of sugarbeet about 6 times, vegetables 4.3 times, and potatoes 2.4 times, etc.

Using the established traditions, and stimulated by the positive results already achieved, all countries anticipate continuation of mutual supplies of new varieties and elite sowing and planting materials. Moreover, production and mutual supply of sowing and planting materials between the individual countries are built on a sound legal, and planned basis. (In 1973 a multilateral agreement for specialization in each country was signed for the production and mutual supply of seeds of the main agricultural crops.)

Selection of cereals has been a vital factor in increasing the grain production in European CMEA countries during the last 10-15 years. The Soviet wheat sort "Bezostaya", "Mironovskaya 804", and recently " Aurora","Caucasus", and others have greatly contributed to this increase.

Towards the end of the last five-year plan, as a result of the joint efforts of selectionists from all CMEA member countries

over 50 prospective sorts of winter wheat, about 20 sorts of winter barley, and great many varieties of maize, etc. were included in international and comparative tests. Some of these varieties will undoubtedly be taken into production during the current five-year period and will influence the food and agriculture,and particularly the forage balance, of the whole Community.

According to data from the coordination center for the elaboration of theoretical bases of selection and seed production, in the comparative international tests for winter wheat very good qualities were shown during the last few years.

Over a 3 year period in the Odessa region,(USSR),the Bulgarian variety "Sadovo-1" exceeded the average annual yield of "Odeskaya-51" by 73 kg/ha. In 1974-1975 "Sadovo-1" and "Sadovo-C" attained the highest yields in the Bratislava region (CSSR) and in the region of the Institute "Matonvashar" (Hungary). The Bulgarian variety "Rubin", "Ogosta", "Kremena" gave the highest yield in the General Toshevo region (Bulgaria) and "Ogosta" took second place in Fundulia (Romania). In the USSR "Rubin" and "Ogosta" gave the highest yields in the Krasnodar region.

High yields were received by the Romanian sort "F-51-68" in the Odessa and Krasnodar regions (USSR), and in Fundulia (Romania). The GDR varieties "Hadmersleben 17257/69", "Hadmersleben 21687/69" and "Alcedo" gave the best results in the Bernburg region (GDR). "Hadmersleben 21687/69" and "Hadmersleben 17257/69" also gave high yields in the Smolitsky region (Poland) and "Hadmersleben 6320/68" in the Pragha-Ruzine region (CSSR).

The selection of "Valya", "Ksenia", "Hohenturm 12/51" varieties developed by the GDR, "Miraj-1", "Intensiv-2", "Azuga", "Gloria", "F-304-72", developed by Romania, as well as "Zimran", "Oasis", "Start", "Zavet-3" and "Poisk" developed by the Soviets show very good results. They are all high-quality and high-yield varieties of winter barley. Recently greater attention has been paid to selection work with maize. The primary reason for this is that the irrigation areas have been extended in the various countries and regions where this crop is cultivated.

The exchange of animal breeds also became widespread, in order to raise the production qualities of national breeds or to improve work on the creation of new breeds. The USSR and the GDR supply breeds of sheep which contribute to production increases of quality wool.

Production of the cross-breeding of Hungarian pigs with Estonian, Romanian and the GDR breeds has contributed to the increased physio-biological stability and maintenance of its national breeds of pigs. The Hungarian breeds "Tetra-L", "Tetra-ShL", and "Tetra-B" are exported to the USSR, the GDR, the CSSR, and other countries in order to improve the quality of national breeds. For this reason, one of the biggest state agricultural enterprises in Hungary, Babolna, has specialized in the production of hens and eggs for use at home and abroad. It also exports new techniques of industrial poultry farming.

The method for the ionizing radiation(X-ray treatment) of plants is one of the most important of a wide spectre of methods and means used in genetics and selection by the European socialist countries over the last few years.

The favorable effects of mutations and ionizing radiation on vegetable substances have been known to the scientific world for over 50 years. These effects were discoverd by the Soviet scientists who use them largely for the creation of a whole series of high-yield and high-quality varieties of crops. Recently pre-sowing irradiation of seeds has made a considerable contribution to raising the yields and nutritional qualities of many agricultural crops. According to the data of the CMEA Secretariat, wide production tests of this method and also selections in production conditions contribute to the considerable increase in yields from the irradiated crops, and in a number of cases to the improvement of their biological quality.

The increase of the average yields of main grain-bread crops varies: wheat - 20-60%, sugarbeet - 25-50%, potatoes up to 36%, tomatoes - 20-30%, alfalfa, lucerne and cotton up to 25%, etc.

Some vegetable plants, like lettuce, carrots, cucumbers, peppers, and aubergines, react especially well to irradiation and their yields increase from 30% to 100%.

The analysis of the biological value of this production in the basic growing crops - wheat and maize - show a higher content of protein, up to 33%, fat up to 42%, sugar up to 35%. The increase of carrotine in carrots reached up to 25%. Vitamin C in fodder crops rose 20%, vitamin C in potato tubers rose from 3% to 6%, etc.

The method of ionizing irradition opens up great opportunities for the preservation of processed foodstuffs. It has been established that this method does not have a negative influence on the nutritional qualities of the products, and there are no harmful effects.

The creation of the necessary conditions and equipment has a decisive influence on the practical application and use of this method. Therefore the European CMEA member countries have already begun to fulfil their specialized programs, which apply the principle of an international and socialist labor distribution.

Scientific research institutes, draughtsmen and production organizations in Bulgaria have all begun working on the creation and adoption of test-industrial equipment for the irradiation of potatoes, onions, fresh and dried fruit and vegetables. This type of project is also being carried out in the CSSR, the Soviet Union and Hungary. However, it should be noticed that in the CSSR and the USSR grain is included among the crops treated by irradiation. In Hungary scientific research is also carried out on the sterilization of nutritional fodders.

Irradiation of potatoes and onions with correct doses of gamma rays, protects them from sprouting during the whole year. The corresponding disinfection of grain and dried fruits by irradiation treatment prolongs preservation 5 to 10 times. This process reduces the losses to a minimum. Irradiation of fresh fruit and vegetables allows for a preservation state 3 to 5 times longer than originally, and reduces losses from microbiological processes considerably.

According to the preliminary economic calculations the use of biological irradiation, irrespective of the considerable capital investment, when compared with the method of chemical treatment, reduces the expenses of labor force in the cultivation of 1 ton of potatoes by 20%.

The capital investment necessary for irradiation treatment of 25 tons of potatoes (for one season) is redeemed in a 4-year term. Disinfection of grain by application of irradiation treatment gave better economic results than the chemical treatment applied up to now. The same applies to irradiation treatment of dried fruit. A thorough examination reveals that the dynamics of food and agriculture development, and the general economic conditions connected with it, have resulted in a series of positive changes in all these countries.

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The stabilization of the economy, the broadening of the material and technical base in the individual countries and in the Community the widely developed international labor distribution, the accelerated application of scientific and technical achievements; all these factors have exercised a direct influence on, and have made considerable contributions to, the further development of food and agriculture and the successful solution of the food problems in each country. Because of the socialist form of common ownership and management of production, the differences in areas of arable land in the individual countries have not resulted in any per capita decrease in agricultural production. On the contrary, high density populations have stimulated the intensification of agriculture and have

contributed to an equal, and in some cases even higher, per capita production in comparison with those countries with larger land resources. The considerable demographic changes in all countries have resulted in an increase in food demand, and also a rapid growth labor productivity in the food and agriculture branches.

Widely developed international trade, and particularly the turnover between the Community countries, show the many possibilities for the more rational use of favorable national conditions and for optimal production specialization and concentration.

The accelerated application of scientific and technical achievements, and especially the joint research and design activities within the framework of the scientific-technical cooperation, have contributed to a more rapid shift from out-moded techniques, technology, plant varieties, etc. to new, more efficient methods.

Although at the present time food and agricultural development is estimated on a common basis in CMEA countries, this development has not been achieved without difficulties. The solution of the food and nutritional problems, within the socialist countries has been affected by constantly changing production, economic and social factors. The interaction of these factors has created a multifarious, complex, mutually determined relationship and balance, the optimization of which has been and is one of the basic goals of the national and the Community's agrarian policy.

Some of the problems concerned with the future food and agriculture development under changed conditions in contemporary Europe have now become topical.

From an analysis of the current situation, the most important problems for the future of food and agriculture development in these countries could be stated as follows:

- Optimization of the urban growth rates in the individual countries taking into account a more accurate estimation of the real needs of agriculture for manpower, distributed according to numbers, ages, sexes, and professional qualifications.

- More effective links between the rates and dimensions of development, and the use of basic productive funds, the gross social product, and national income created by food and agriculture.

- Complex assessment of each country's future possibilities for active participation in food and agriculture labor distribution within the whole Community, and with the non-socialist countries.
- Further exchanges of information between individual

countries and the CMEA and the non-socialist countries on food and agriculture production, especially in the area of scientific and technological expertise and experience, and also of sowing and breeding materials.

II. MATERIAL RESOURCES AND FACTORS DETERMINING FOOD AND AGRICULTURE PRODUCTION.

2.1 Land Resources and their Utilization

The total agricultural area of the European CMEA member countries was 608,991 thousand hectares in 1975. It has increased by 32,117 thousand hectares since 1960, the greatest part belonging to the USSR, where during the 1960s 42 million hectares were reclaimed. To a lesser extent there was also an increase in agricultural areas in Bulgaria and Romania. The remaining European CMEA member countries reduced, although insignificantly, their agricultural land by excluding the less fertile areas, and areas used for construction of buildings, roads and other non-agricultural purposes. In 1975, 44.28% of the agricultural area was plowland, although in that year the plowland has been reduced by 2.2%, compared to 1960, while the areas of perennial plantings and natural pastures increased. (See Table 8)

The differences in the natural as well as the economic conditions in the individual Community countries have determined some significant differences in the structure of their agricultural areas, especially in sown areas. In all countries the cereals and pulse crops cover most areas but the percentage share of these crops in some areas varies considerably from country to country. In 1975 it varied between 55.5% in the GDR and 65.6% in Romania. The changes in the structure of these areas in individual countries shows a relative decrease of cereals and pulse crops in Bulgaria, Hungary, Poland, and Romania, and an increase in the CSSR, the GDR, and the USSR. These variations have mainly taken place in the wheat sown areas - the most important cereal crop in the European region. The percentage share of the wheat area in the CSSR increased from 12.6% in 1960 to 23.8% in 1975, in the GDR from 8.7% to 14.8%, in Poland from 8.9% to 12.6% and in Hungary from 19.8% to 25.5%. It decreased in all the remaining countries. The greatest reduction, from 32.3% to 22.1% occured in Bulgaria. The reduction was not so severe in Romania, 29.1% - 24.7%, or in the USSR, 29.7% - 28.8%, from all sown areas.

The causes determining such changes, are manifold. They are partly connected with the technical development of production, and partly with the changing economic conditions. From 1960-1975, the European CMEA countries began to cultivate some highly fertile and high-quality varieties of wheat, e.g. the Soviet varieties "Bezostaya", "Mironovskaya 804", "Aurora", and "Caucasus", and others which have resulted in a sharp increase in wheat yields.

The improvement of agricultural techniques, as well as the complex mechanization in the production of cereal crops introduced into a number of countries, have also contributed to the

Table 8

Agricultural Land Area (in thousand hectares)

Country	Year	Total Agricultural Land	of which					
			Arable Land	Plough Land	Perennial Planting	Including Vineyards	Natural Meadow	Natural Pasture
People's Republic of Bulgaria	1960	5672	4279	3991	345	180	257	791
	1965	5793	4167	3823	396	192	257	973
	1970	6010	4142	3632	386	195	244	1238
	1975	5955	3957	3699	382	196	279	1215
People's Republic of Hungary	1960	7141	5417	5417	287	204	495	943
	1965	6954	5233	5233	417	247	419	885
	1970	6875	5189	5189	405	230	406	876
	1975	6770	5126	5126	370	206	386	889
German Democratic Republic	1960	6420	4848	4848	204	0.3	875	493
	1965	6358	4718	4718	203	0.3	834	603
	1970	6286	4618	4618	199	...	771	698
	1975	6295	4699	4699	238	...	729	629
People's Republic of Poland	1960	20403	15961	15169	262	...	2390	1790
	1965	19637	15158	15005	267	...	2539	1673
	1970	19543	15060	14855	266	...	2523	1695
	1975	19209	14713	14513	371	...	2545	1580
Socialist Republic of Romania	1960	14547	9821	9733	525	311	1387	2814
	1965	14791	9814	9692	661	312	1371	2945
	1970	14930	9733	9176	778	347	1416	3003
	1975	14946	9741	9648	759	329	1413	3033
USSR	1960	515364	230280	219980	3659	1046	44074	237260
	1965	542828	230035	223409	4525	1064	42235	266033
	1970	545778	226648	223459	4481	1087	40197	274452
	1975	548812	226553	225462	4416	1170	36251	281592
CSSR	1960	7327	5128	5128	300	24	1079	821
	1965	7160	5068	5068	319	28	992	781
	1970	7093	4992	4992	342	34	966	793
	1975	7004	4899	4899	358	41	906	841

Source:

Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 61

increased yields. Therefore, at the end of the 1960s, this growth in wheat production and in the world market supply has enabled a cutback in production to be made latterly. An extension of the growing areas of other cereals, industrial, and forage crops is now possible.

The general intensification of agricultural production in all countries has also contributed to this decrease. The vast areas, particularly in Bulgaria, Hungary, and Romania, which were previously covered with cereals,have been used for the production of food, vegetables, and some industrial crops. The new high-quality and more adaptable varieties of wheat have enabled some countries, e.g. the CSSR, the GDR, the USSR, and Poland to extend production areas, in order to achieve a considerable increase in volume and a high level of self-sufficiency.

The prices on the international market during the last few years have influenced the changes in the structure of the sown areas in the individual countries. Some of them, e.g. the CSSR, Hungary, and the GDR, have considerably increased their wheat areas, keeping its percentage share of a comparatively high level. The CSSR has increased this share by 100%, the GDR by 70%, and Hungary by 30%. In other countries, e.g. Poland and the USSR, these changes were made during the 1960s and they have kept the share of wheat areas almost constant during the 1970s. Only two countries, Romania and particularly Bulgaria, have followed a policy of constant reduction of wheat areas.

The considerable changes in the structure of the sown areas have affected an important fodder crop - maize. In Hungary, the areas of maize have been enlarged from 26.6% in 1960 to 29% in 1975, and in Bulgaria from 15.9% to 17.6% respectively. They have decreased from 36.7% to 34.3% in Romania, which is a highly specialized producer of maize, and in the USSR from 2.5% to 1.2%. In the other countries the maize growing was smaller, because the climatic conditions do not allow this crop to ripen. The grain maize areas remained almost constant in Bulgaria and Hungary. In the USSR, these areas were reduced 50%, and in Romania by 7.48%.

During the last few years almost all countries have paid more attention to another important fodder crop - barley, and these areas have been considerably enlarged. The USSR, which already cultivates barley on a large scale, expanded its growing area in 1975 by 2.6 times; correspondingly, the GDR expanded by 2.4 times. In Bulgaria, the barley areas have been enlarged by 84.3%; in Poland, by 86.2%; in Romania, by 66.9% and in the CSSR, by 38.6%. Hungary is the only exception. Here barley areas during the last few years have decreased. The generally increased interest in barley production can be explained on the one hand by the rising demand for forage, and on the other by the use of the new most productive varieties and also full mechanization.

Owing to the unfavorable natural conditions in most of the CMEA countries, this region is not suitable for maize growing for the following reasons:

- In some regions the average annual temperature is not sufficiently high for the maize to ripen.

- In other regions the average rainfall is inadequate to produce high yields.

In the latter case production of maize is only possible in regions with irrigation systems. In drought conditions the barley growing areas give better results.

The third forage crop in this European region, oats, is cultivated over a relatively small area. The USSR and Poland have the largest areas of oats in the Community; however in the USSR the areas remained roughly the same in 1975 as in 1960, and in Poland they showed a slight increase. The remaining countries greatly reduced the areas of oats; Bulgaria by more than 3.5 times, Hungary by about 3.5 times, Romania by nearly 4 times, and the CSSR by about 2 times.

The cereal areas were reduced in almost all countries, with the exception of the USSR, where there was an increase from 3221 thousand hectares to 5670 thousand hectares.

The increased demand for stock breeding forage during the the last few years, has determined the land growth of the other main forage crops - forage root crops, maize for silage, and green fodder, etc. This growth was considerable in Poland and Romania but not so marked in Hungary and Bulgaria. In two of the countries, the percentage share of these crops decreased, 30% in the USSR, and 21.1% in the GDR; nevertheless it was still relatively high. In the CSSR, in spite of some fluctuations during certain years, the figures were around the same level in 1975 as in 1960.

Many structural changes within the countries' sown areas were determined by two significant factors: during this period the collectivization of agriculture and later the amalgamation of agricultural enterprises were carried out in most of the countries (with the exception of Poland). Important decisions for further specialization in production, size, optimization of the separate branches, and effectiveness have been implemented in all countries.

Moreover, during the period under investigation, different authorities of the CMEA, as well as the commissions for bilateral economic cooperation between the countries, have repeatedly dealt with the constant problem of an international division of labor among the CMEA countries. As a result a new conception concerning specialized production of agricultural products, for which there exists the most favorable natural and economic conditions at the national level, has been developed and gradually realized.

As a result, in 1975 the structure of sowing areas in the individual countries showed some characteristics of specialization. The distribution of land areas among the main agricultural crops in Bulgaria was as follows:

wheat	819	thousand hectares
barley	575	" "
oats	50.2	" "
rye	16.6	" "
grain maize	652	" "
pulses	64.4	" "

The distribution in Hungary was:

wheat	1251	thousand hectares
barley	257	" "
oats	44.7	" "
rye	104	" "
grain maize	1423	" "
pulses	95	" "

In the GDR:

wheat	693	thousand hectares
barley	936	" "
oats	246	" "
rye	595	" "
grain maize	2.9	" "
pulses	52	" "

In Poland:

wheat	1842	thousand hectares
barley	1335	" "
rye	2792	" "
oats	1291	" "
grain maize	14.8	" "
pulses	229	" "

In Romania:

wheat & rye	2386	thousand hectares[1]
barley	442	" "
oats	70	" "
grain maize	3305	" "
pulses	108	" "

In the USSR:

wheat	61985	thousand hectares
rye	8010	" "
barley	32547	" "
oats	12107	" "
grain maize	2652	" "
pulses	5670	" "

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[1] The Romanian statistics class wheat and rye areas together.

In Czechoslovakia:

wheat	1183	thousand	hectares
barley	960	"	"
oats	221	"	"
rye	191	"	"
grain maize	158	"	"
pulses	199.7	"	"

The changes in the structure and the use of agricultural land areas in all CMEA countries during the whole period show their pursuit of a solution to the cereal-bread, and cereal-fodder problems, by utilizing the advantages of production intensification as well as contemporary scientific and technological achievements. The policy, implemented in all countries, to further consolidate this process of intensification has contributed to the replacement of the cereal-bread and cereal-fodder crops with perennial planting, industrial crops, legumes, etc.

Also in evidence is a policy to keep the main lines of agricultural development independent of the influence of the highly changeable international market situation. Thus, the various countries have tried to solve the problems of production by introducing a set of stable internal and international factors based on long-term efficiency.

Under this policy, most of the countries have been successful in their long-term planning. However, in the short-term, the approach was accompanied by a temporary disturbance of national balances and sharp increases in the importation of some cereal and fodder crops.

2.2 Productive Livestock and Animal Husbandry Development

Animal husbandry takes an important place in the CMEA member countries' agricultural structure and plays a substantial role in the solution of food and agriculture problems. During the last few year the economic changes, the stabilization of factors influencing the rise in the living standards and the increased purchasing power of the population, have all determined the constant demand for animal products. Animal protein forms a large part of the population's nutritional requirements and the consumption of animal products continues to increase rapidly, especially in the countries where the national diet was severely lacking in this in the past and today the population is approaching an optimal level of nutrition.

A favorable factor for productive animal husbandry development in most countries is the collectivization of agriculture, implemented at the end of the 1950s. As a result of collectivization and mechanization in agricultural production the number of

working animals has been reduced, and a consequent increase in supply of forage for productive animals has become available. The amalgamation of animal husbandry enterprises itself has contributed to the improvement of the livestock breed structure, specifically in relation to specialized breeds. This has resulted in the creation of livestock with a high productive potential. The existing and particularly the new animal husbandry farms have become highly specialized to meet the national and international market requirements. The general adoption of large stock farms as a basic production unit has created prerequisites for a wider application of modern methods and technology for the production of animal foodstuffs. It increases the opportunities for veterinary aid and control not only over livestock reproduction, but also over the creation of animal production.

During the period 1960-1975 these favorable factors led to a quantitative growth in all kinds of productive animals, excluding goats. The total number of horned cattle in the European CMEA countries has increased from 101,674 thousand head in 1960 to 143,640 thousand head in 1975, i.e. an increase of 41.27%. (See Table 9)

This growth rate was highest in the USSR, with 46.52%, Poland with 46.80%, Romania with 35.23%, and the GDR with 18.33%. A reduction in the number of horned cattle, although insignificant, was observed only in Hungary.

The total number of cows increased from 46,279 to 56,136 thousand head. This growth took place mainly in the USSR - 21.5%. Romania and Bulgaria also showed an increase of 14.29% and 9.67% respectively. The growth rate in Poland was not so marked. However in some countries, e.g. the CSSR, and the GDR, there was a slight decrease. Hungary showed the most marked reduction - 11.49%, which occurred principally in the period 1966-1970, when an improvement of the breed structure of livestock and a sharp reduction in low productive animals was effected in all countries.

During the last five-year period the number of horned cattle in all countries has increased. In most of them the number of cows has also increased; this was evident in Bulgaria, the USSR, and Romania. In Poland and the CSSR there was also an overall rise in numbers, with some fluctuations. Only in the GDR and Hungary were the numbers constant.

The search for a speedy solution to the problem of the meat balance has led to an interest in the development of pig-farming in each country. On average, the number of pigs has increased between 1960 and 1975 from 98,808 thousand head to 117,385 thousand head, i.e. by 18.8%. The increases in Romania and Poland were very high, 104.95% and 71.6% respectively. Negative growth has been observed in the USSR, where in 1975 the number of pigs decreased 16.5% as a result of the low corn-forage production. The pig numbers in Bulgaria, Poland, the CSSR,

Table 9

Livestock and Poultry (at the end of quoted years, thousand head) in state, and cooperative enterprises and privately owned by the population

Country	Year	Cattle, includ. Buffaloes & Yaks	Cows, includ. female Buffaloes & Yaks	Pigs, (all ages)	Sows only	Sheep	Goats	Horses	* Poultry	Chickens only *
People's	1960	1642	641	2553	172	9333	247	312	23.4	22.2
Republic	1965	1577	643	2408	151	10312	436	240	20.8	19.0
of	1970	1353	628	2369	192	9678	335	170	33.7	31.1
Bulgaria	1975	1725	703	3889	290	10014	321	133	38.1	35.9
People's	1960	1965	849	6388	488	2250	66	490	39.6	35.9
Republic	1965	1920	782	6590	440	2460	75	307	41.7	38.9
of	1970	1912	763	7311	547	2316	80	222	61.3	57.5
Hungary	1975	1904	760	6953	533	2039	15	156	56.1	52.9
German	1960	4675	2175	8316	885	2015	439	447	36.9	31.9
Democratic	1965	4762	2169	8878	824	1963	302	272	38.0	32.0
Republic	1970	5190	2163	9684	988	1598	135	127	43.0	30.8
	1975	5532	2155	11501	1117	1883	53	70	47.1	30.5
People's	1960	8695	5885	12615	1562	3662	273	2805	71.9	63.5
Republic	1965	9480	5775	14367	1756	2572	205	2495	80.3	70.4
of	1970	10220	5829	13863	1698	2661	127	2569	87.6	76.7
Poland	1975	12764	6138	21647	2130	3168	...	2100	99.8	88.8
Socialist	1960	4530	2240	4300	545	11500	404	1000	38.0	...
Republic	1965	4935	2008	5365	461	13125	807	689	40.1	34.2
of	1970	5216	2276	6359	682	13818	536	668	54.3	46.6
Romania	1975	6126	2560	8813	821	13865	445	562	78.6	...
USSR	1960	75780	34489	58674	4701	133014	7290	9909	516.0	448.0
	1965	93436	39347	59576	4108	129764	5552	7977	491.0	473.0
	1970	99225	39762	67483	4045	138059	5362	7429	653.0	621.0
	1975	111034	41917	57899	3713	141436	5655	6415	740.0	718.0
CSSR	1960	4387	2047	5962	545	646	616	330	28.2	26.7
	1965	4389	1948	5544	430	614	521	188	27.8	26.4
	1970	4288	1881	5530	440	981	285	131	39.2	37.6
	1975	4555	1903	6683	509	805	121	62.5	40.1	38.7

Source:

Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 67

* millions.

and the GDR have rapidly increased over the last five years. A similar situation has been observed in the USSR, except for the abovementioned decrease in 1975.

There are two principal reasons for this rapid increase:

- the greater application of modern industrial methods and highly productive techniques on the big stock farms;

- the increased demand not only from those countries where the climate is severe (e.g. the USSR and Poland) but also from Hungary, Romania, and Bulgaria where pork is a national tradition.

The period 1960-1975 is characterized by some structural changes in pig-farming which increased the number of breeds used for meat, instead of those used for bacon and lard.

The number of sows from more prolific breeds has increased. As a result of this, some countries such as the CSSR and USSR can be provided with more pigs for fattening.

Sheep-farming plays a secondary role in the Community countries' solution to the national meat balance and it has a limited influence on the increase in the milk balance. Despite this, it continues to develop, especially in the USSR, Romania and Bulgaria. Such expansion not only provides important raw materials (e.g. wool and hides), but satisfies the food preferences for particular populations (e.g. mutton and yoghurt). The total number of sheep has increased from 161,774 thousand to 173,210 thousand, i.e. an increase of 7.07%; the greatest increase is seen in the USSR, 8,422 thousand. Bulgaria and Romania also have a highly developed sheep-farming sector.

During the last five-year period a general stagnation in growth rates have been observed. In the USSR, the GDR, and Poland, sheep numbers have increased very slowly. In Romania they have remained constant, but in the CSSR and Hungary they have decreased. Further future development in sheep numbers will be affected by the following factors:

- Limited natural pastures (as a result of the extension of cultivation areas).

- A decrease in available manpower in agriculture. (In spite of the technical progress made in some areas of sheep-farming, e.g. water supply, forage, shearing, etc., it still remains one of the most labor consuming branches.)

- The limited application of modern techniques in this sub-branch.

- In some countries the sheep-farming traditions died out a long time ago, and there are today no successors to replace their skills.

Goat-farming plays a relatively small role in the animal husbandry branch in the Community countries. The total number of goats amounted to 6,567 thousand at the end of 1975. This represents a 33.70% reduction when compared to 1960. Most of the goat herds are found in the USSR, i.e. 86.11%, but there, as in all the countries (Bulgaria and Romania excluded), their number has been greatly reduced. There are two reasons for this:

- Objections from the forestry authorities, who consider that goats destroy the young trees and thus hinder the replanting of forests (most of the CMEA member countries rely on forest regions, which contain suitable pastures for the breeding of their goats).

- The fact that in each of these countries all branches of agriculture have to be developed intensively, and goat-farming does not lend itself to such intensification.

During the period under investigation, considerable increases in the development of poultry-farming were achieved. The number of poultry rose by 345.8 million, i.e. 45.86%. In relation to the size of the land and the population, the highest poultry numbers were found in Hungary, the GDR and Romania.

During the last five-year period, the numbers have increased at a constant rate annually in Poland, Bulgaria, the GDR, Romania, and the CSSR. This situation also applies to the USSR up to 1974, but in 1975 there was a reduction below the 1974 level, once again due to the decreased production of corn-fodder.

In Hungary, the increased number of poultry reached a peak in 1970, followed by a sharp decrease in 1972. A gradual increase came in 1975, but this did not reach the 1970 level. However, despite annual fluctuations, Hungary has the most highly developed poultry-farming in the Community.

Three factors have a positive influence over the development of poultry-and pig-farming:

- The rapid physiological reproduction of these animals.

- The broader possibilities for the application of existing industrial farming methods and technology in the large-scale enterprises.

- The greater demand for pork and particularly poultry meat in these countries. Up to now the percentage share of poultry meat in most CMEA countries has been lower than the proportion recommended for nutritional needs in this region.

In general the development of animal husbandry in the Community countries has been implemented:

- Within the framework of a socialist economy (state and cooperative enterprises).

- In private or personal farms.[2]

The leading sector in animal husbandry development is the state and cooperative enterprise. In 1975 in the state and cooperative sector of the whole community, there were 73.86% of all horned cattle, 59.15% of all cows, 61.99% of all pigs, and 77.87% of all sheep.

For the whole period the total number of horned cattle in this sector increased 70.13%, and the number of cows and female buffaloes 52.16%. The total number of pigs in the state and cooperative enterprises also increased - 25.76%, and the number of sows - by 13.43%. Sheep increased 13.45%.

The only group of animals which decreased in the state and cooperative enterprises were goats - by 6.65%.

State support has contributed to the more rapid development of animal husbandry. However, the principal factors are the increasing economic opportunities for large-scale enterprises and their ability to use the available technical, scientific, (e.g. veterinary and medical advances) and other conditions for the concentration of productive animal husbandry on a large scale, with modern and efficient organization.

The rapid increase in the number of nearly all types of productive animals is an indication of the attention paid by all of the countries to the development of this important branch of agricultural production. The faster rates of increase on the collective farms (state and cooperative) show the general direction of development, that is, the enlargement and consolidation of the large farms through the application of a modern industrial approach to production organization.

By taking advantage of their individual social and economic conditions, and the possibilities for production specialization, and by adapting swiftly to the fluctuations of internal and international markets, the individual countries have adopted different approaches to the production development of various animals.

However, there has been a general policy to preserve the number of female animals used for furthering reproduction of certain herds, especially cattle.

Despite the increase in the price of cereal and grain crops in almost all of the countries, during the last five years a decrease in the number of stock, especially cows, has not been evident, except in Hungary.

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[2] Private farms are individually owned (the owners are not members of the cooperatives, or workers on state farms); personal farms are owned by the members of cooperative farms and state workers who work them in leisure time.

This is most clearly observed in the USSR, where the number of cows continued to increase between 1972 and 1975, despite the unsuitable climatic conditions that necessitated large imports of forage crops.

Nevertheless, the increase in the number of animals emphasizes the significance of the forage problem and demonstrates the current increasing imbalance between the growing number of animals and the limited possibilities for producing more forage. In spite of the extensive use of industrial chemistry and microbiological products which are added to the animal fodder to influence the metabolic process, the fundamental problem of the forage imbalance has to be solved in the near future.

All European CMEA countries allow (and some actively encourage) personal (and, in Poland, private) animal farms. This policy has been extensively implemented over the last five-year period. In this way the most rational use of the existing fodder resources and also of the leisure time of manpower engaged in agriculture or related activities, can be achieved. However some differences in the national policies can be observed.

Bulgaria's agrarian policy strongly supported development of personal pig-farms. As a result of the number of pigs, and particularly of sows, which were personally owned in 1975 was greater than in 1960.

The development of personal cattle-farming has also been encouraged during the last few years. Therefore in 1975 the number of personally owned horned cattle, including cows and female buffaloes, was higher than in 1970. The number of personally owned sheep and goats was considerably higher than in 1960 although the most progress was achieved during the 1961-1970 period.

Romania's agrarian policy has also given priority during the last five-year period to increasing personally owned horned cattle, including cows and female buffaloes, but in 1975 the number of these animals was lower than in 1960. The number of personally-owned pigs and sheep, however, has decreased steadily during the entire 15-year period.

Poland's agrarian policy has supported the development of all kinds of private animal husbandry, with the exception of goats. As a result of this, in 1970 the number of privately owned animals was regularly higher than in 1960. During the last five-year period this number increased the most rapidly.

The USSR's agrarian policy supported, particularly in the period 1961-1965, the development of personal cattle-and pig-farming. As a result of this the number of personally-owned horned cattle, including buffaloes and yaks, and pigs increased. After this year the number of these animals slightly decreased.

In 1975, however, it was higher than in 1960. Small variations have been observed in the policy of personal sheep-farming development. The number of personally owned sheep increased up to 1970 and after this point rapidly decreased, so that in 1975 it was 14.28% lower than in 1960.

Two of the European CMEA member countries, the GDR and Czechoslovakia, followed a policy of constantly reducing personal animal husbandry during the entire period. As a result, the number of all personally owned animals in these countries decreased. This process was much more rapid during the last five-year period. The decreased number of personally owned animals, however, did not influence the general development of animal husbandry in both countries, because of the much more rapid increase in the number of animals in state and cooperative farms.

2.3 Mechanization, the Use of Chemicals in Agricultural Production, and the Utilization of Water Resources.

The CMEA member countries have paid great attention to agricultural production during the last 15 years. After the initial stages of this development - the collectivization of land, livestock and other basic productive means - had been completed, a strong emphasis was placed on intensification. This policy of general intensification was neither accidental, nor a result of short-term conditions. It stemmed from the characteristics inherent in the centrally planned economy.

Of primary significance here, are the favorable conditions created for production integration after certain prerequisites had been fulfilled. These prerequisites were:

- The establishment of large state and cooperative enterprises;
- The amalgamation of these enterprises;
- The creation of large branches of production (large homogenous plantations for the production of different agricultural crops, large cattle farms, factories for pig- and poultry-farming), etc.

The further intensification of agricultual production also depends on the provision of other important factors:

- Increasing agricultural mechanization (tractors, seed-drills, combines, etc.);
- The growing number of transport techniques used in agriculture;
- The greater volume of chemicals (fertilizers, preparations and others) stimulating production or preserving crops;

- The growing number of highly qualified specialists working in agriculture (agronomists, livestock experts, agricultural engineers, economists, etc.);

- The presence of a wide and well-developed network of agricultural research institutions;

- Extensive irrigation systems to make full use of the countries' water resources for agricultural purposes.

A consideration of the circumstances, and general direction of the development towards further intensification of agricultural production, will demonstrate that the agrarian policies in the CMEA countries have systematically created material factors and other requirements necessary for this process. [22,33,54,60,62,63]

An essential element of the investment policy of all countries over the last few years is that the capital investment has increased not only in agricultural production but also in the industrial branches connected with it. Priority has been given to:

- Machine building - the production of tractors and trailers;

- Development of chemistry for the production of fertilizers and pesticides;

- Expansion of the machine and equipment industry for irrigation plants;

- The expansion and modernization of storage systems;

- Development of the microbiological industry;

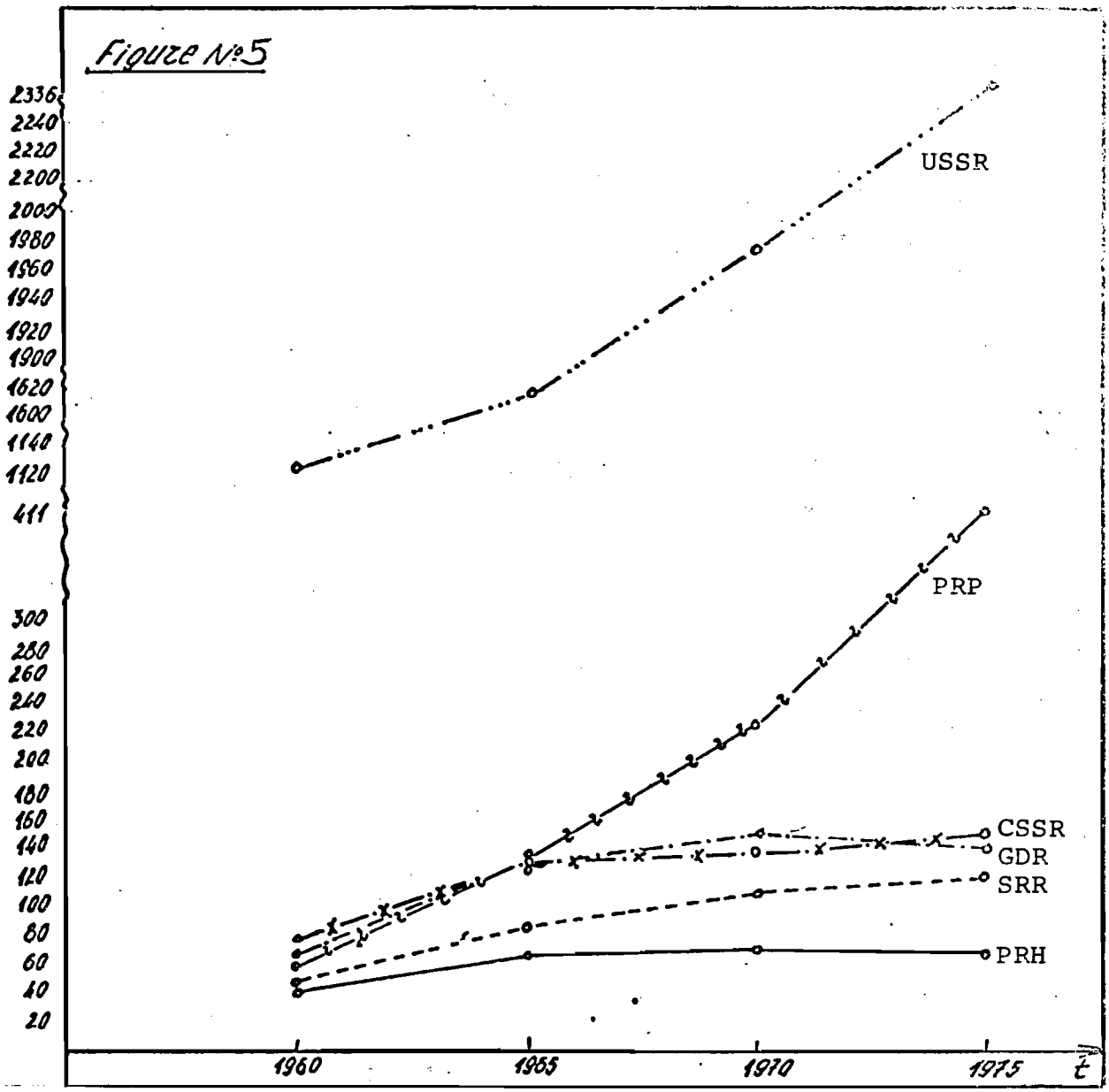
- The expansion and modernization of the food industry - especially meat and milk processing;

- The development of refrigeration and packing techniques and materials;

- The production of electronic devices for agricultural use.

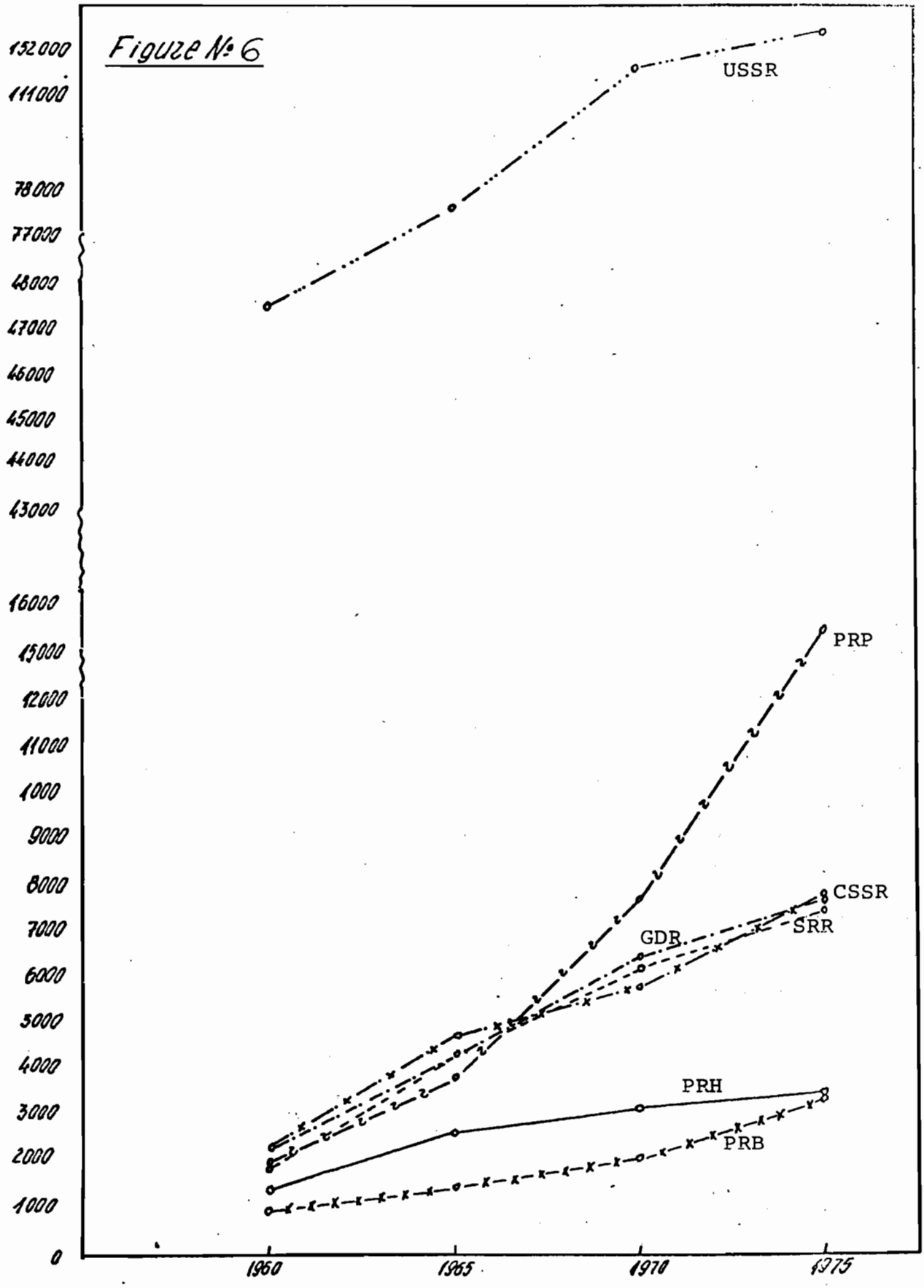
New agricultural techniques are characterized by higher productivity - the power of tractor engines has increased and the capacity of the attachments has been extended. The total number of tractors for the period 1960-1975 has increased from 14,159 thousand to 32,116 thousand in the Community countries. In the individual countries, however, the increase was at varying rates, in the separate periods. The most rapid increase of tractors (in physical units) was in the USSR and Poland, particularly between 1966-1970 and 1971-1975. The total rated horsepower of tractor engines increased much more rapidly - 3.4 times. (See Figures 5 and 6)

FLEET OF TRACTORS IN THOUSAND UNITS (AT YEAR'S END)



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 75

FLEET OF TOTAL RATED HORSEPOWER OF TRACTOR ENGINES, THOUSAND H.P., (AT YEAR'S END)



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 75

This indicates not only an increase in physical units, but an increase in the average power capacity of the tractor. The aim of this policy was to accomplish a variety of agricultural activities with one tractor, thus utilizing this important agricultural technique most effectively.

The experience of the large agricultural enterprises demonstrates that a tractor with 100 h.p. or less cannot solve the problem of sufficiently mechanizing all agricultural processes. Therefore, the percentage of super powerful tractors - 220 and 300 h.p. - is being increased. They can pull more,large mechanical attachments which perform heavy duty work under difficult conditions. This leads to greater economic efficiency.

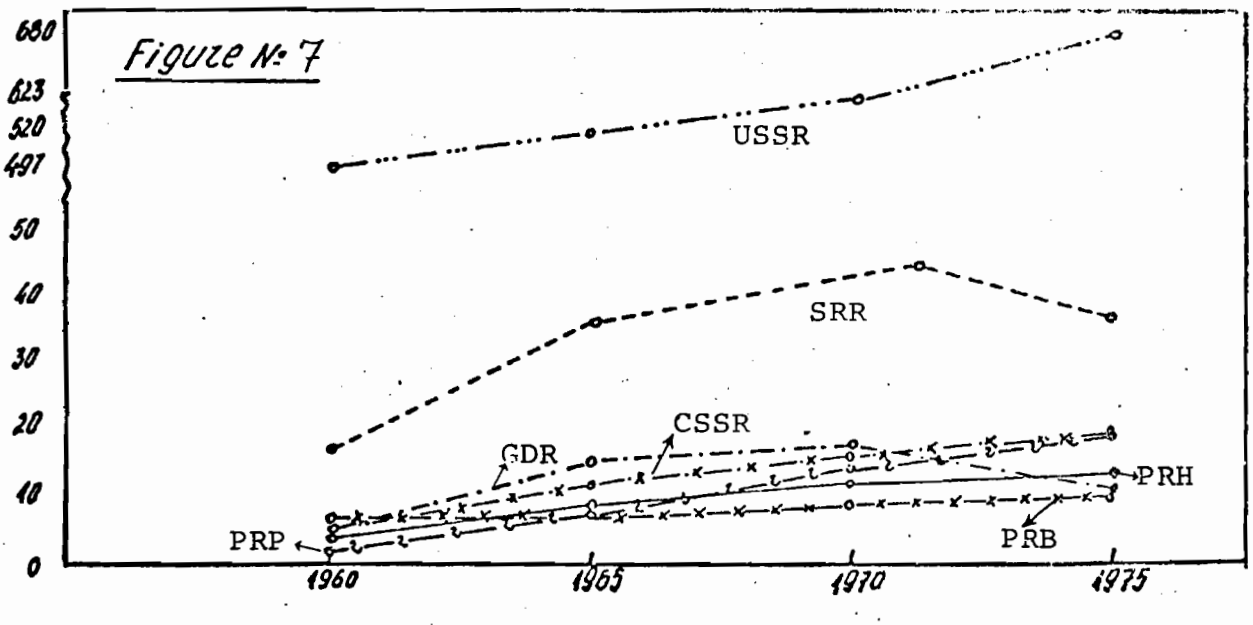
An essential task is to adapt the power of motive force and machines to the biological characteristics of productive capacities of new varieties of plants and breeds of animals, and to the requirements of the new economic conditions existing in agriculture. At the same time it is not the tractor's actual power that is the immediate factor influencing agricultural production, it is in fact the tractor's attachments. Therefore, the agricultural investment policy of central planning countries pays special attention to this type of equipment. The rapid development which has taken place during the past few years, and particularly the success of agricultural machine-building, has contributed to the solution of this problem. The most important of this type of machine is the combine, which has successfully solved the problem of harvesting crops, reducing the need for human labor during one of the most important periods of the agricultural process - havesting. The number of combines in the Community has increased 1.5 times from 541.6 thousand in 1960 to 795.1 thousand in 1975. (See Figure 7)

In four of the CMEA countries, namely the USSR, Bulgaria, Hungary, and the CSSR, the number of combines has continued to increase over the whole period. In two of the other countries, Romania and the GDR, however, it decreased after 1970. This decrease, as well as the comparatively slow increase in the other countries, is due to the trend of building large production capacity combines for bulk harvesting. Therefore, despite the decreased supply of combine harvesters, their overall production capacity has risen.

The increasing number of tractors necessary for agricultural production and the increased power of tractor engines has led to considerable use of this kind of motive force in agricultural production. For example, while in 1960, in all the European CMEA countries there were 189 h.p tractor engines per 100 hectares of plowland and perennial planting, these forces reached h.p. in 1975 - an increase of 3.7 times.

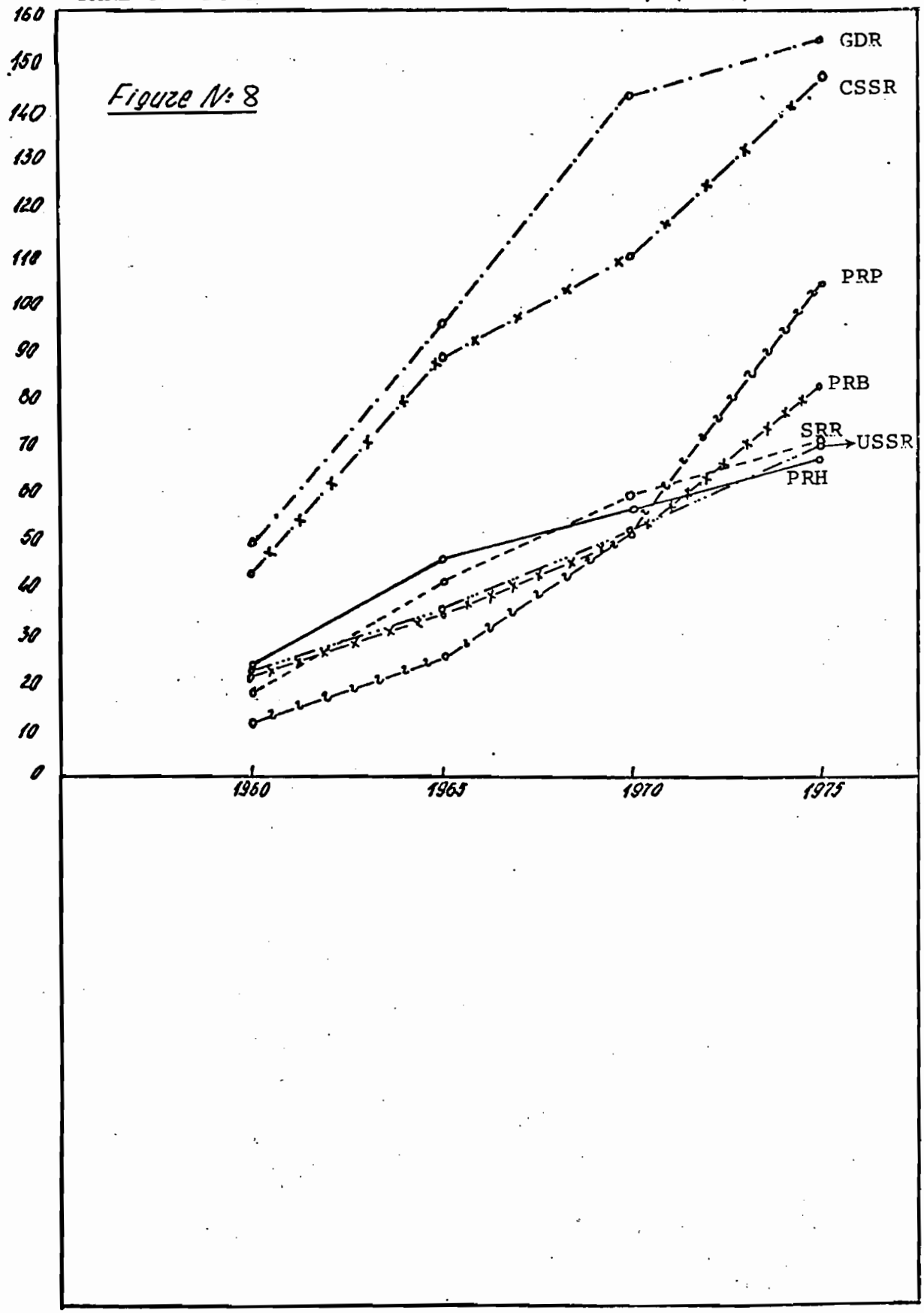
At the end of the period the GDR and the CSSR owned the greatest total tractor horsepower per 100 hectares - 154 h.p. and 147 h.p. respectively. Hungary and the USSR had the smallest - 66 h.p. and 69 h.p. respectively, but the rates of increase of tractor engine power in these countries show their desire to overcome this shortcoming. (See Figure 8)

FLEET OF GRAIN COMBINE HARVESTERS, THOUSAND UNITS,
(AT YEAR'S END)



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 75

FLEET OF RATED HORSEPOWER OF TRACTOR ENGINES BY 100 HECTARE OF PLOWLAND AND PERENNIAL PLANTINGS, (H.P.)



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 75

The lack of uniformity in the tractor power supply within each country is conditioned by some independent factors, such as, the existing differences in the structure of their agricultural production and in the motive power requirements of their individual crops. This will determine the need for an increase in such machinery in some countries, but a decrease in others. The more labor-intensive agricultural production of Bulgaria and Hungary (i.e. the presence of a great number of labor consuming crops), demands a greater tractor force per area in comparison with those countries without such a production structure. Countries such as the GDR and the CSSR also need higher horsepowered tractors per 100 hectares of plow- and perennial-planting land because of the fairly severe manpower shortage in the agricultural sector. Another significant influence on the demand for tractors is the extent of the use of animal horsepower within the individual countries.

Therefore, in spite of the evident efforts to achieve greater horsepowered tractors, the development of further mechanization in the separate countries would not equalize the nominal power per one area unit of arable land and perennial plantations. Moreover, the non-arable land differs considerably in the various countries, and this also influences the supply of tractor engines, because some of these are used for work on non-arable land, meadows, pastures, etc.

The data on the annual supply of tractors and combines in the different countries show, in most cases a tendency towards increased supplies. In 1975, the USSR supplied its agricultural production with 2.4 times more tractors than in 1960; in Poland the increase was 5.4 times; and in Romania, the GDR, and Bulgaria the increase was between 20-25% more. Only two countries showed decreases in the number of new tractors provided for agriculture during this period, i.e. Hungary and the CSSR, of 40%. However, the data on tractor engines supply show a considerable increase in these countries (2.7 times for Hungary and 3.4 times for the CSSR). This indicates that both countries have directed their activities mainly towards an increase in tractor power, instead of increasing their absolute numbers.

As regards the annual supply of combines, an increase was evident during the last few years in some countries. In Hungary it was 27.23%, in the USSR 61.22%, in Poland 89.23%, and in the CSSR the increase was very large - approximately 200%. In the rest of the countries the number of grain harvesters delivered annually remained constant or in some cases decreased. The reason for this lies in the fact that there was a sharp rise in the supply of combines towards 1960, and the policy since has been to maintain the optimal number for production.

Structural and quantative changes in the fleet of tractors and combine harvesters in the CMEA countries have been strongly influenced over the last few years by a new policy. In this policy priority has been given to the production of more modern, highly productive and effective techniques. In the USSR, production of the heavy tractors, K-701, T-150, and MT3-80 has been increased. In Poland production of the tractors "Ursus" and in the CSSR, the tractor "Zetor", has been developed, and

Bulgaria has produced a tractor T54B. The GDR has brought out modern models of the grain combines E-512 and E-516. Poland has produced the grain combine "Bizon Super", and the USSR "Kolos", "Niva" and "Sibiriac". Furthermore, as a result of joint collaboration between Bulgaria, the USSR and the GDR, a machine for gathering sugarbeet, KS-6, has been developed.

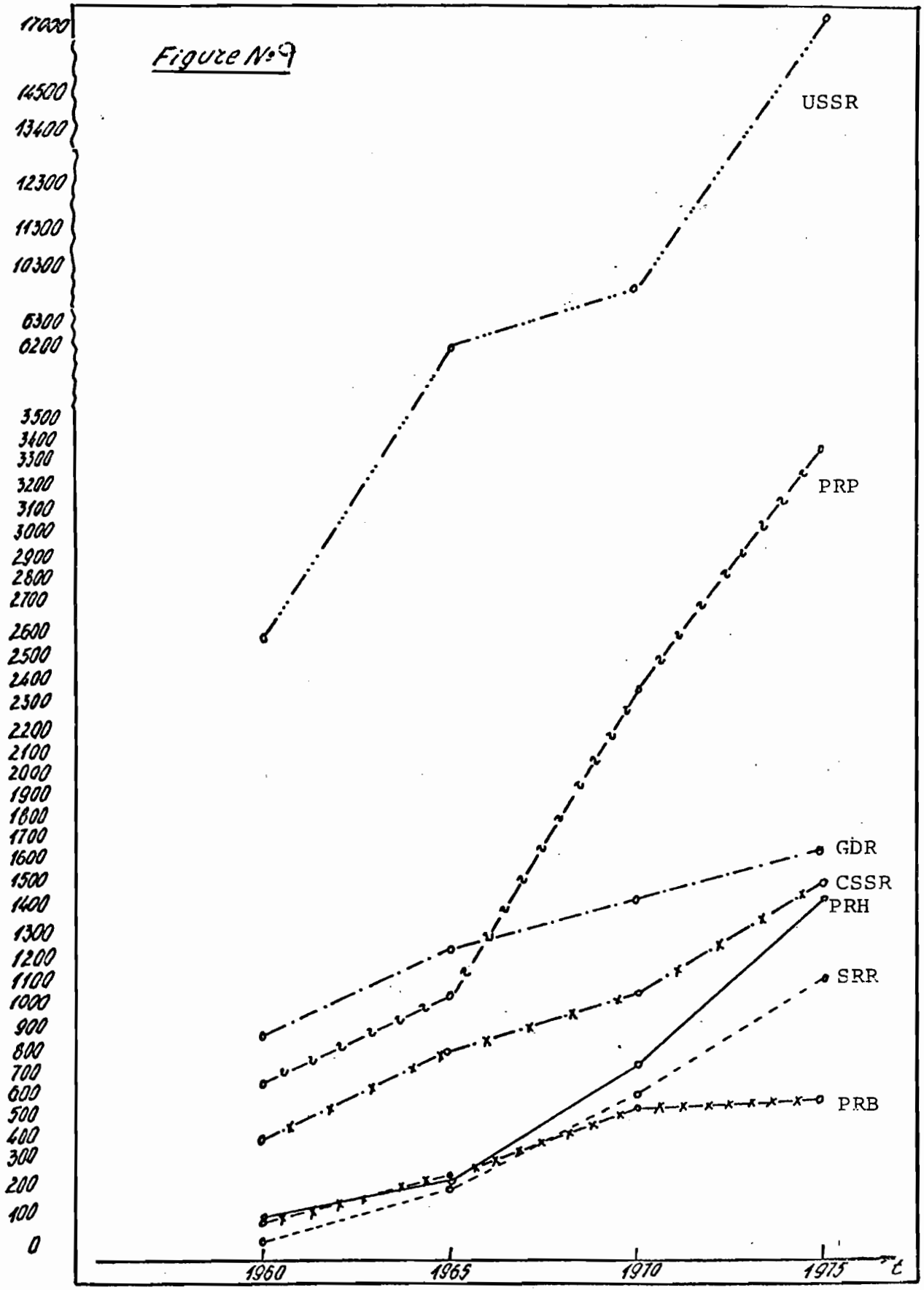
Considerable development has also taken place in the field of chemistry as applied to agricultural production. The increased production capacities of the European CMEA countries' chemical industries and the import of chemical fertilizers and preparations from Western countries has resulted in a substantial increase in the amount of mineral fertilizers in agriculture. (See Figure 9) The total quantity of all mineral fertilizers in all European CMEA countries increased from 52,371 thousand tons in 1960 to 273,460 thousand tons in 1975. The supply of mineral fertilizers increased rapidly: in the USSR, 6.5 times; in Hungary, 9 times; and in Romania, 14.6 times. This increase was slower in the GDR and in the CSSR where the degree of chemical application in agriculture was relatively high at the end of the 1950s. In 1975 in the GDR, 290 kg of mineral fertilizers (in nutrient equivalent), per hectare were applied; in the CSSR - 231 kg; in Hungary - 227 kg; in Poland - 182 kg and in Bulgaria - 114 kg. Quantities used per hectare in the remaining countries were under 100 kg, e.g. in Romania - 80.1 kg and in the USSR - 81.4 kg. Calculations per hectare of plowland and perennial planting show that the total amount of mineral fertilizers applied were 370 kg in the GDR; 305 kg in the CSSR; 276 kg in Hungary; 236 kg in Poland; 160 kg in Bulgaria; 114 kg in Romania; and 76.7 kg in the USSR. (See Figure 10)

The most important of the mineral fertilizers in all countries were the nitrogenous fertilizers. In 1960 these represented 30.56% of all fertilizers used in agriculture that year, their percentage share has since increased 41.60%. The use of potash in (K_2O equivalent) and phosphorous (in P_2O_5 equivalent) fertilizers decreased over this period from 34.92% to 30.96%, and from 34.45% to 27.42% respectively.

At the same time the necessity for an optimal combination of chemical stimulants for production growth, with physiological and biochemical requirements from the vegetable and animal output of agricultural production is being taken into consideration. This is being done, in order to protect the consumer against the harmful consequences of chemical stimulants.

The most effective use of water resources in the European CMEA countries is the third most important factor contributing to the development of plant cultivation and animal husbandry. The development of irrigation systems and other related activities has also influenced the development of
in the individual countries in another respect. Some of them, e.g. Bulgaria, Romania, Hungary, have a water shortage, especially at the vital stages of plant and vegetation development. Others, e.g. Poland, the GDR, and the CSSR, need more irrigation plant construction for agricultural production development.

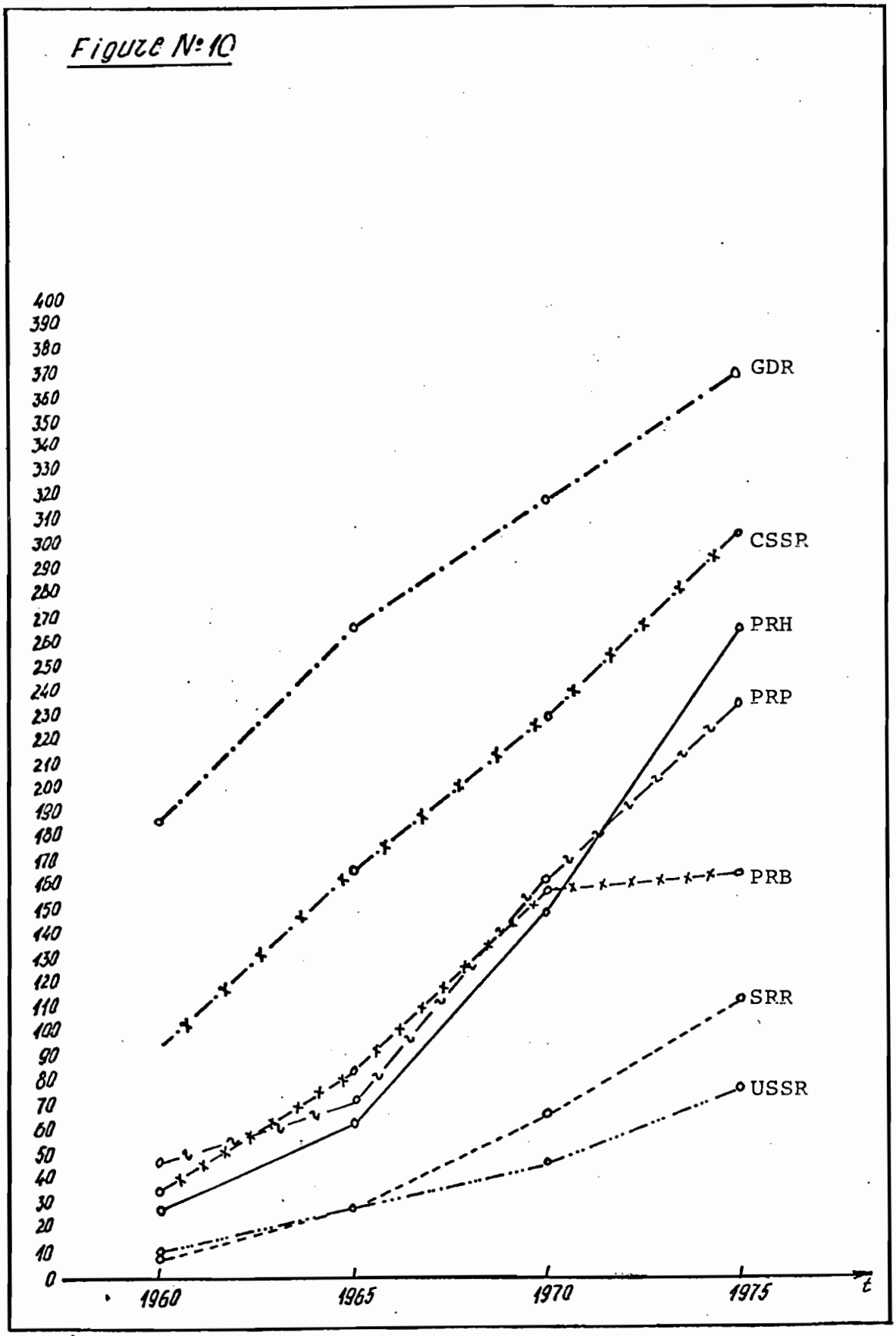
DELIVERIES OF MINERAL FERTILIZERS TO AGRICULTURE (IN THOUSAND TONS) (IN NUTRIENT EQUIVALENT)



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 77

DELIVERIES OF ALL MINERAL FERTILIZERS (IN NUTRIENT EQUIVALENT) SUPPLIED PER 1 HECTARE OF PLOWLAND AND PERENNIAL PLANTINGS (IN KG)

Figure №10



Source: Статистический ежегодник стран-членов СЭВ, Изд, Статистика, М., 1976, табл. 77

The problems of irrigation farming in the USSR are very complex and at the same time very important. During certain seasons and years, the southern Republics of Grusia, Armenia, Kazakhstan, Moldavia, Ukraine, and RSFSR, have acute water shortages, while the northern regions of RSFSR, the Byelorussia Republic, Lithvania, Latvia, Estonia, suffer from a water surplus. For that reason both regions need a more rational utilization of water resources for agricultural purposes and large-scale irrigation construction. The areas in which the main agricultural crops are cultivated are not situated in the regions where abundant snowfalls and precipitation occur.

The climatic conditions in the regions with a considerably higher degree of precipitation either are not favorable for the cultivation of agricultural crops, or this cultivation needs a number of other additional draining and reclaiming activities. As a result about 2/3 of all the land in this country used for the purposes of agricultural production suffer from water shortages. Approximately 40% of the arable land is situated in regions with snowfalls and rainfalls of less than 400 mm. In the regions with over 700 mm, which may be considered as optimal from the point of view of the development of the majority of crops cultivated here, only 1% of the country's arable land is situated here.

The regions where mainly grain is cultivated, provide the state resources for areas such as the north Caucasus, the steppe part of the Ukraine, the Volga region, Kazahstan and Siberia's virgin lands which are situated in the drier regions.

In order to overcome the negative influence of regular and periodic draughts, a long term program for development of melioration construction was sanctioned in the USSR in May 1966. Between 1965-1974, 33 milliard roubles capital investment was invested in draining and irrigation activities. By the end of 1974 14 million ha of arable land was drained or prepared for irrigation, which was double that between 1955-1965. Towards the end of 1974, the meliorated areas in the Ukrainean SSR reached 3.3 million ha, which was almost double that for 1965 and the drained and irrigated areas already contribute to 10% of this republic's gross agricultural production.

In a number of regions like the Crimea, the Herson and others, two crops are cultivated yearly.

As a result of these measures, the USSR towards the end of 1975 had about 25 million ha of irrigated and drained areas, 90% of which are used as productive agricultural areas.

The relative share of the meliorated (irrigated or drained) lands in the USSR is still small - 7% of the country's total agricultural area. In spite of that, they give over 20% of its gross agricultural production. Production of grain from the meliorated land only during the period 1965-1975 increased from 5 million tons to 11.3 million tons.

In Bulgaria special attention has been paid to the problems of irrigation systems, because of the severe droughts in particular seasons and their unfavorable influence upon the yields of basic agricultural crops and also upon the animals. The irrigated areas of the country increased over 10 times in the years after the Second World War. Towards the end of 1975 these areas amounted to 1.2 million hectares, which form about 30% of the country's total arable land and 28% of the areas adapted to irrigation. In all CMEA member countries the total area which requires irrigation amounts to approximately 136 million hectares. However, in 1970 only 14 million hectares were irrigated. The irrigated areas in these countries have been extended rapidly, for example, during the period 1961 to 1970 they were increased 1.8 times faster than 1951 to 1960, and in the period 1971-1980 the irrigated areas are expected to double.

In spite of this considerable progress in all CMEA member countries, the optimum utilization of water resources in agriculture has yet to be achieved. Therefore in the near future the acceleration of irrigation construction is to be anticipated. The question of the further improvement of irrigation systems and methods has also become very acute. In their aim to achieve more effective utilization of water resources, irrigation plants have been automated. At the same time the long process of extensive reconstruction of existing plants has also taken place.

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The changes,realized during the investigated period, in the structure of land resources and their usage, and in the number and structure of herds, testify to the pursuit of a consistent policy, among all CMEA countries, of full utilization of the available natural and other material and technical resources. The constant expansion of the material and technical equipment of agricultural production, and the line of its general intensification is also related to this policy.

Irrespective of its positive merits, assessed from a systems analysis position, the results of the usage of the material resources and factors influencing agricultural production raise a number of important questions.

- The first concerns the optimization of land usage in each individual CMEA country and in the Community as a whole, this involves a consideration of soil and climatic conditions of the different regions and micro-regions, the changing social and economic conditions, as well as the production possibilities created by modern techniques and technology.

- The next question relates to the economic expedience of temporary fluctuations - influenced by the international market situation - within the established structure of land utilization and especially in the cases when these changes affect annual crops (such has been the case with wheat crops during the last five-year period). The changes in the international market situation and the increasing nutritional demands of the population require a new solution to the following questions: the number and structure of the productive herds; the limits and rates of growth of the various kinds of productive livestock; and the international specialization within the Community in this basic sub-branch of agriculture.

An overall economic assessment of the dimensions and rates of the further development of mechanization must be made by:

- creating a precisely calculated structure of the various kinds of engines and attachments;

- securing a maximum use of their productive capacity;

- adapting the techniques to the objects of agricultural production;

- expanding automation under the conditions of the centrally planned economy and mechanization.

Considerable possibilities would be revealed in the further modelling of:

- chemical processes through optimization of the required quantities;

- natural and artificial fertilizers and stimulants;

- kinds and methods of cultivating crops in the various regions and micro-regions;

- preparation for protecting plants;

- and preserved food production.

An extremely important and largely unsolved question concerns the most rational and economical utilization of the limited water resources for the needs of agricultural production.

The immense investment of capital, techniques and manpower for the solution of this task, and the inevitable interweaving of agrarian problems with those of energy, industry, transportation, settlement systems, etc., necessitates the full utilization of the interdisciplinary approach of systems analysis. In this way the negative influences must be assessed together with the consequences of changing conditions, with effects of agricultural production on the environment, and with the ecological balance.

III. LEVELS, TRENDS AND RATES OF PRODUCTION AND CONSUMPTION OF THE MAIN AGRICULTURAL PRODUCTS.

3.1 The Growth Rates of Agricultural Production. Production Volume of Main Crops and Products. General Structural Changes.

The changes in the socio-economic conditions - amalgamation of agricultural enterprises[1] the extended use of modern technology, the implications of agricultural production specialization, and the increased intensification of agriculture - have all positively influenced production in the various agricultural branches.

Consequently the production of main agricultural commodities in the European CMEA countries from 1960 to 1975 has shown a marked upward trend, despite fluctuations within individual years and different rates of growth in the separate periods. (See Figure 11)

In the individual countries and in the different five-year periods, this line has varied considerably. In Bulgaria, for example, the growth of gross agricultural production at the end of each of the investigated five-year periods was comparatively even; during the first - 16.67%; and during the last - 16%. However, it was considerably higher in the years of the second of these five-year periods (1966 - 1970) - 19.05%. This process, when observed in individual years over the whole period, reveals another peculiarity. Production growth has usually taken place in the first years of the five-year periods, after which it has remained approximately constant. This was especially evident during the last two five-year periods, when a more marked growth in production was realized in 1967 and 1972.

Hungary has shown a line of comparatively low rates of growth in agricultural production at the beginning of the period, especially during the first five-year period. As a result, production in 1965 was only 6.1% greater than in 1960.

During the last five-year period, however, the growth of agricultural production in this country was rapid. It rose steadily and in 1975 achieved a 26% increase above the 1970 level.

Total agricultural production in the GDR also increased comparatively slowly at the beginning of the period (1961 - 1965). In 1965 it was 4.49% greater than in 1960. Over the last five-year period production was accelerated, and in 1975 a 15% increase above the 1970 level was evident.

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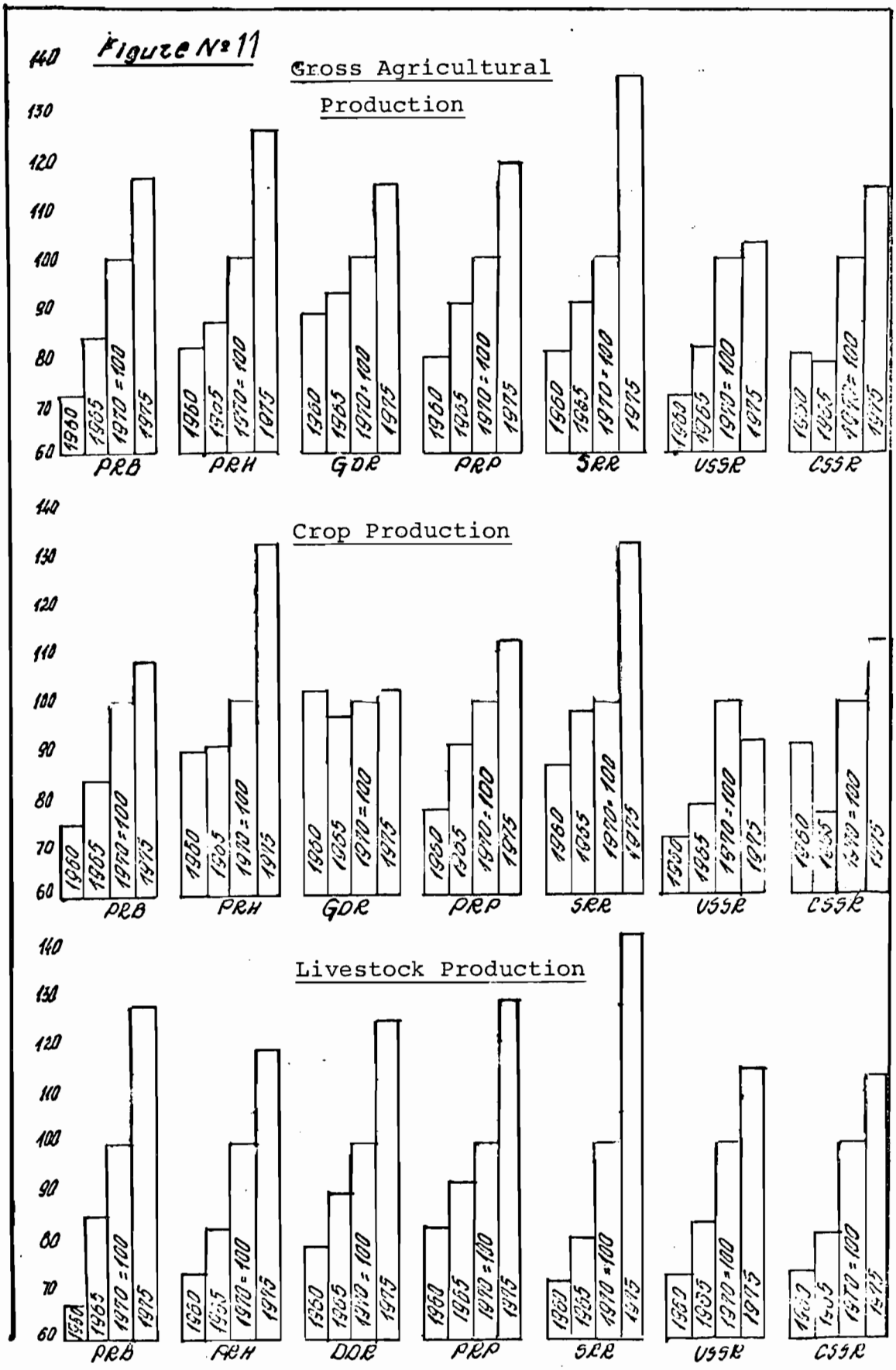
[1] Here and throughout this paper the term 'enterprises' is used to indicate agricultural farm.

INDICES OF GROSS AGRICULTURAL PRODUCTION (1970 = 100)



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 58

Considerable progress in the growth of gross agricultural production from 1971-1975 was made by Poland, which as early as 1973 increased its production by about 20% and remained at that level until the end of the five-year period.

Romania has achieved the highest index of gross agricultural production growth during the last few years. In 1975 it produced 37% more than in 1970. The relatively low level of 1970 had a considerable influence on this growth. Compared to the mean level of the preceding five-year period, the increases of the last few years have been more moderate, but they have demonstrated quite clearly the accelerated growth of gross agricultural production in this country.

Gross agricultural production growth in the USSR, the largest CMEA country, is characterized during the investigated period by a unique feature. The highest rates of agricultural production growth in this country have been registered in the decade 1961-1970, and more especially from 1966-1970. Gross agricultural production volume in the USSR increased 21.95% only in the years of the above-mentioned five-year period. Between 1971 and 1975, however, as a result of the extremely unfavourable climatic conditions in 1972 and 1975, there has been only a limited increase in gross agricultural production.

Similarly, Czechoslovakia, during the entire investigated period pursued a policy of accelerated growth of gross agricultural production. In spite of fluctuations during individual years, this policy has been carried out successfully. In 1975, Czechoslovakia produced 14% more than in 1970.

The greatest changes in the volume and rates of gross agricultural production growth in almost all countries were observed for all the principal crops. These changes have determined the bread and fodder balance of the Community and have therefore had a considerable influence on the general solution of the food problem on a global scale.

The constant increase and average yields of cereals and pulse crops has affected the other sub-branches. From 1960 to 1970 the growth of plant-growing production was most considerable; in the USSR - 38.9%, in Bulgaria - 33.4%, in Poland - 28.2%, in Romania - 14.9%, in Hungary - 11.1% and in Czechoslovakia - 9.9%. The GDR was the only country in which production decreased - 2%. Differences in the techniques used, and particularly in the productive possibilities of new varieties, have influenced the yield fluctuations during individual periods.

Unfavorable climatic conditions in 1972 and 1975 have strongly influenced the volume of plant-growing production in the USSR, the GDR and Bulgaria over the last five-year period.

Despite temporary fluctuations in the Community's production of the principal crops over the whole period, they rose considerably. Total production of cereals and pulse crops increased from an average of 180,258,000 tons in 1961 to 1965, to an average of 235,838,000 tons in 1971 to 1975. Wheat holds the largest proportion and the most important of grain crops, increasing during this period from 78,880,000 tons to 114,569,000 tons.[2]

The two basic forage crops, barley and maize, rose as follows:

- barley - 109% (from 26,013,000 tons in 1961 to 1965 to 55,562,000 tons in 1971 to 1975,

- maize - 13.5% (from 24,422.3 thousand tons to 27,723.5 thousand tons).

The production of rye and oats is varied for all countries. While rye production decreased 15.04%, oats increased 84.34%. In both cases, these changes are due to the decreased production of rye and the increased production of oats in the USSR.

There has been a considerable increase in the volume of cereal and pulse crops, particularly in corn fodder. Whereas, average growth in cereal production over the period 1961-1970 was 12.13%, during the period 1971-1975 it was 27.92%.

During the entire period all countries have increased their gross agricultural production. The growth in plant-growing production had the most significant influence on this output. Compared with 1960, in 1975 the total production of cereals and pulse crops did not change. This is also due to the increase achieved in the USSR, which compensated for the decrease in the other countries.

Comparison of the data on the above-mentioned crops shows that in most cases production growth is due to the increased average yield. This is especially typical for wheat, whose production rose, even though in most of the countries this was accompanied by a decrease in cultivated areas.

This signifies once again that in spite of the considerable changes in the agriculture of the CMEA countries, the Community's agrarian policy and the individual national policies have not underestimated the importance of bread-cereal crop cultivation as a solution to the population's dietary requirements.

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[2] In Romania the data for wheat and rye production is classed together.

Other agricultural crops which have also been the object of the Community countries agricultural policy are fruit, vegetables, potatoes, sunflowers, and sugarbeet.

The production of sunflowers in all countries increased from an annual average of 6,028.2 thousand tons in 1961-1965 to 7,323.4 thousand tons in 1971-1975. The largest proportion - 82% - belongs to the USSR. Romania and Bulgaria are also major producers of sunflowers and have achieved an annual average increase. The increase in sunflower production was caused by several factors: the importance of the seeds as raw materials for the food industry; the existing industrial capacity for vegetable oil production; the use of oil cake and groats for animal forage; and also the higher prices on the international market.

The success of the selection varieties, particularly those created by Academician Remeslo which have an exceptionally high oil output and resistance to"broom-rape" (orobancheramosa), has also contributed to the successful production of this crop.

The raised national production of another industrial crop - sugarbeet - can be explained by the following two factors: a processing industry for this crop already existed; and transport costs involved in the import of sugarbeet were high. Average annual production in all these countries increased from 89,426 thousand tons to 111,653 thousand tons. Again the USSR showed the greatest increase - of 16,813 thousand tons. A production increase was also observed in Poland, Czechoslovakia, Bulgaria and Romania. In the GDR this remained constant. The quantities of sugarbeet mentioned above only relate to that used for sugar production, except in the GDR where sugarbeet fodder is included.

Potatoes are an integral part of the population's diet in the CMEA region and particularly in the USSR, the GDR and Poland. They also provide forage for animal husbandry. For these reasons potatoes play an important role in agricultural production. Together with wheat and rye, potatoes reached a high level of production after the Second World War, and this has continued to increase. The total average annual production of potatoes in all European CMEA countries increased from 148,009 thousand tons during the first five-year period to 157,554 thousand tons in the last period. The greatest quantity came from the USSR, which produced 56.57% of the Community's average annual potato production. The second largest quantity came from Poland, which produced 29.88%, and the third from the GDR with an annual average of 6.86%.

The total Community production of vegetables rose from an annual average of 26,700 thousand tons in the period 1961-1965 to 34,840 thousand tons in 1971-1975. The greatest

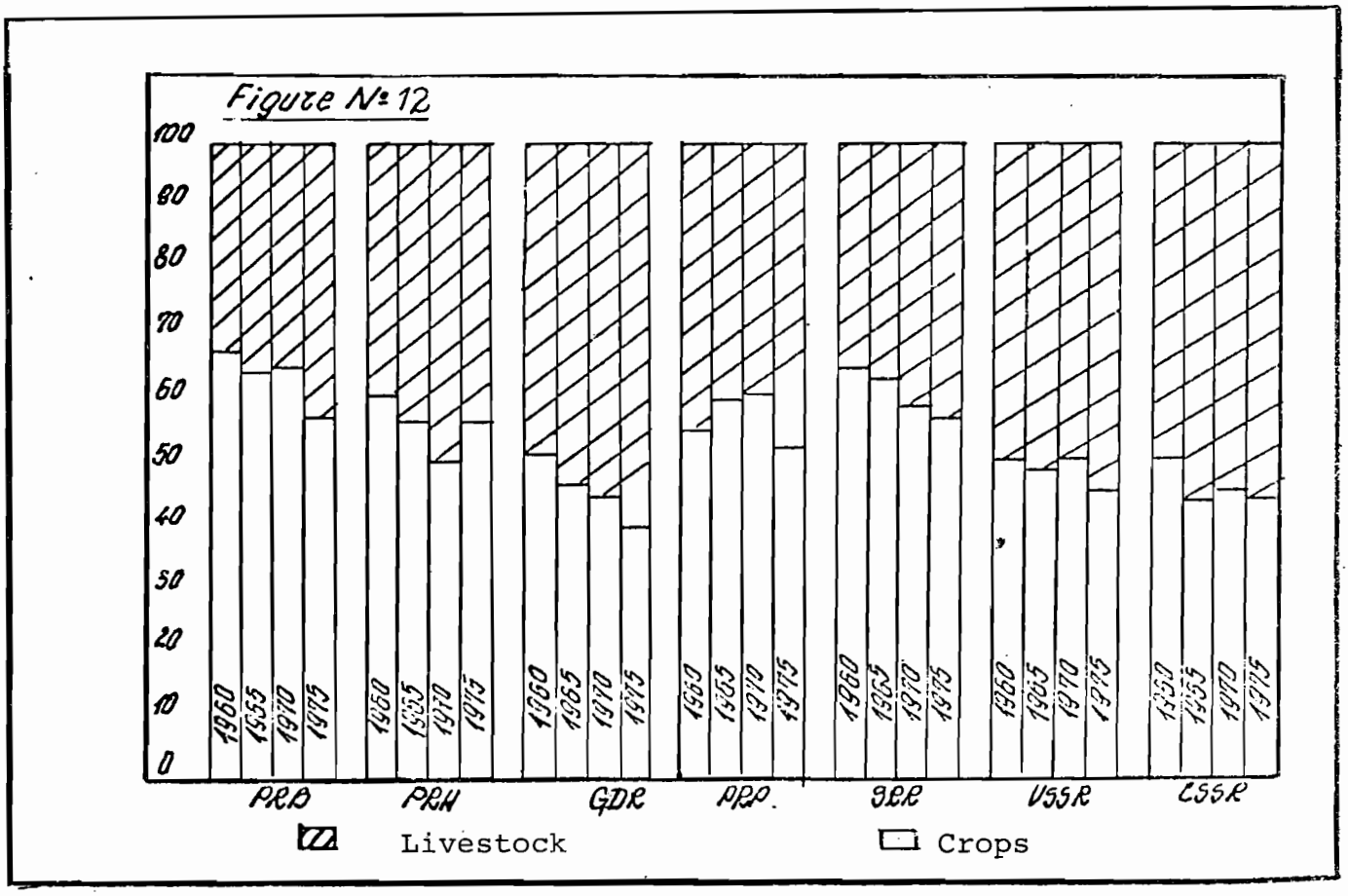
increase was in the USSR, which in the last two years has produced 36.13% more than at the beginning of the period. The main contribution to the production of high-quality vegetables has been from the countries situated in the southern regions: Poland, Bulgaria, Hungary, Romania, and some of the southern Soviet Republics. This has resulted in their more favorable natural conditions and their accumulated experience in cultivation and production. These countries are also the main producers of valuable fruit crops: peaches, apricots, strawberries, grapes, etc. However the increase in the production of other fruit crops, particularly apples and plums, is due to more extensive cultivation in the USSR, the GDR, and Poland. The average annual fruit production within the Community has developed quite rapidly during the first five-year period which increased from 13,545 thousand tons to 21,245 thousand tons in the last five-year period. Once again the USSR was not only the largest fruit producer in the Community, but the country where fruit production increased most rapidly. During the period 1971-1975, the USSR produced 58.28% of the total Community fruit yield, increasing its national production by 91.04% in comparison with the 1961-1965 period. Despite the considerable increase in fruit production, in most of the countries the demand for certain kinds of fruit - strawberries, peaches, apricots, etc.- has not been fulfilled.

Great attention has been paid to plant-growing in all of these countries, but the development of other basic agricultural branches, e.g. animal husbandry, has not been disregarded. On the contrary, over the 15-year period definite progress in the development of these branches has been evident. Total livestock production followed a trend of steady increase, although at different rates in the individual countries. In 1975, this increase in Romania was 98.6% in comparison with 1960; followed by Bulgaria - 91%; Poland - 55.4%; Hungary - 61%; the GDR - 58%; the USSR - 56% and Czechoslovakia - 55.4%. Most of this growth was reached during the last five-year period, when the rates of production were accelerated in almost all countries.

Estimated over a long period the changes in livestock production demonstrate the policy of constant growth in almost all countries. Without exception this production has increased, particularly over the last few years. This development has led to qualitative changes in the structure of agricultural production. As a result, the balance between plant-growing and livestock production has swung in favor of the latter in all countries. (See Figure 12)

These changes were greatest in Bulgaria and Romania. They were also considerable in Hungary, and Czechoslovakia, but were less obvious in the USSR and in Poland, because the percentage share of animal husbandry in both of these countries was well developed in the past. As a result, in 1975 the proportional share of livestock production exceeded

STRUCTURE OF GROSS AGRICULTURAL PRODUCTION



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 59

plant-growing production in the GDR, Czechoslovakia and the USSR. The other countries, Bulgaria, Poland, Hungary, and Romania, where livestock production was still lower than that of plant-growing, also made significant progress.

Several factors have determined these structural changes and emphasized the more important position of animal husbandry, in particular:

- The increased demand for animal meat products, milk and milk products, as a result of the rise in living standards;
- The increased demand for specific kinds of animal products (veal and mutton) and meat products (sausages, etc.);
- The agricultural enterprises' aim to carry out a complete production cycle, by utilising their own forage.

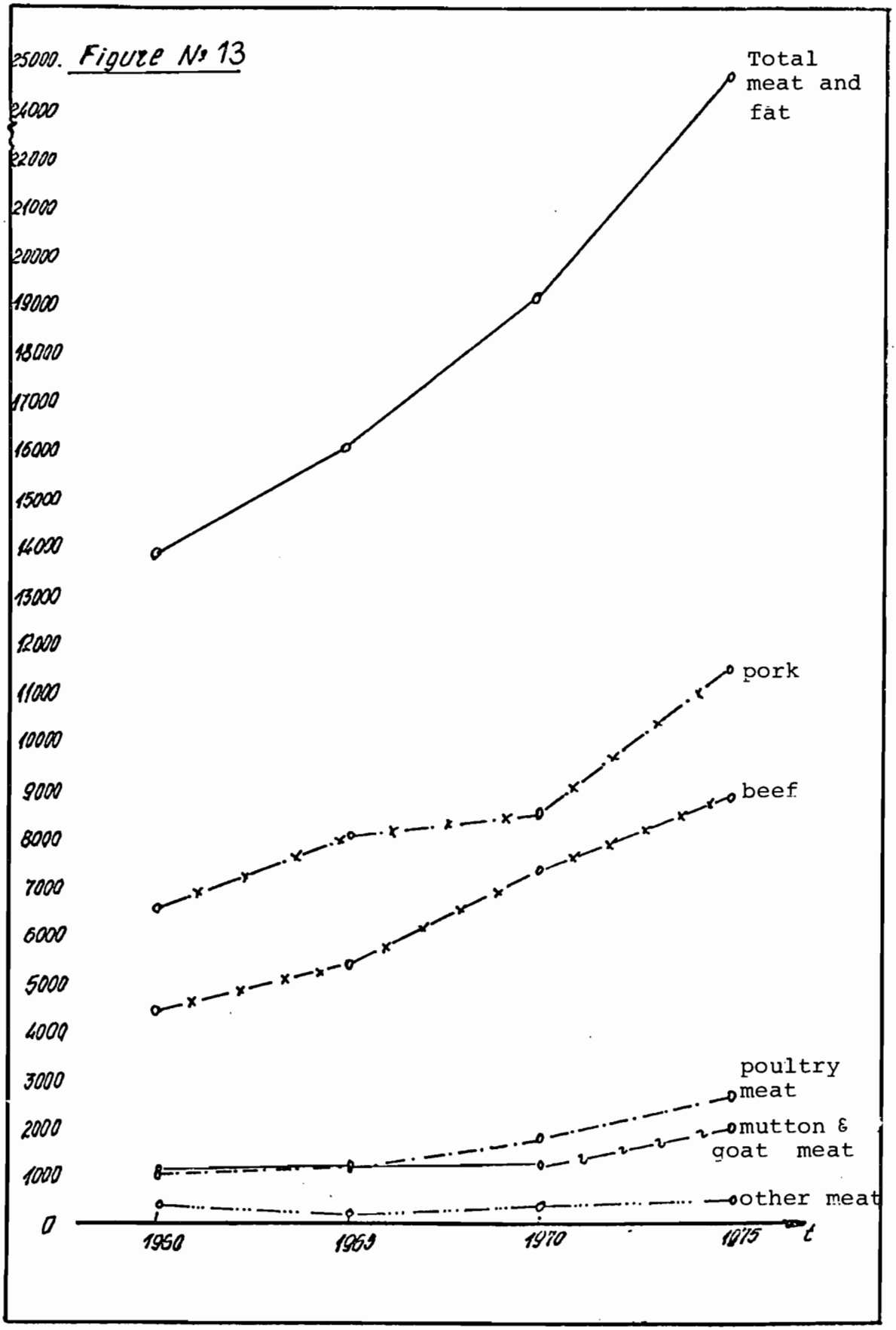
The increased number of livestock and their correspondingly increased productivity has determined the greater volume and faster growth of all kinds of animal products.

The production of meat and fat (slaughtered weight) in all countries increased from 13,939 thousand tons in 1960 to 24,648 thousand tons in 1975 (76.83%). Beef production increased respectively from 4,483.7 thousand tons to 8,806 thousand tons (85.25%). A considerable rise in pork production took place, from 6,598 thousand tons to 11,454 thousand tons (73.6%), that is, 50% of the Community's entire meat and fat production. The production of poultry meat increased approximately 2.2 times, rising to 2,582 thousand tons in 1975. Only the volume of mutton and goat meat has remained constant, since both the main producers, the USSR and Bulgaria, have not increased production.

A comparative analysis of the indicators for animal production during individual years and periods demonstrates the particular attention which has been paid to the production of pork and beef. (See Figure 13)

In spite of comparatively little growth at the end of the second five-year period, the average growth rates during the first and last five-year period (1961-1965,1971-1975) are completely satisfactory. As a result, pork maintained its leading role in the structure of meat production in the Community. Beef production showed rapid growth rates, particularly between 1966 and 1970. In actual volume this production followed closely behind the increase in pork production. If the higher quality and commercial value of beef is taken into account, it could be concluded that the economic importance of beef is equal or even greater than that of pork production.

MEAT PRODUCTION IN SLAUGHTERED WEIGHT (THOUSAND TONS)



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 69

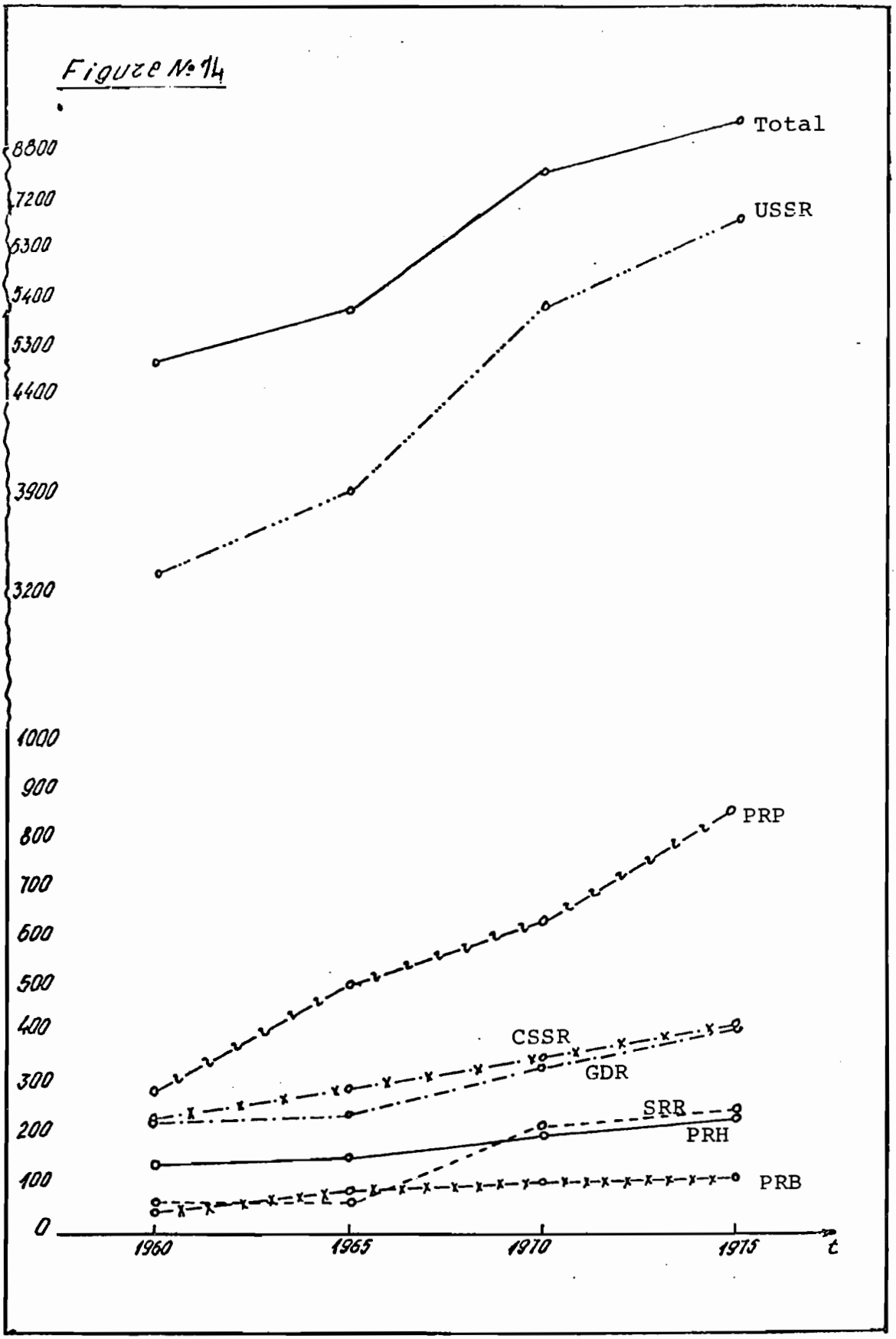
Regardless of the rapid rise in the volume of poultry, it continues to hold a limited position in the total meat and fat production of the Community. The percentage of mutton and goat meat is even smaller. An analysis of the indicators for each country's beef production shows that in all cases national beef production has increased. (See Figure 14) The biggest and most rapid growth was in the USSR, where in 1975 75.49% more beef was produced than in 1970. The second largest beef producer, Poland, also experienced considerable growth rates, increasing production by about 2.2 times. Czechoslovakia is another large beef producer. During the entire period production increased steadily, and during the last ten-year period the production growth rate in the GDR has risen steadily. In 1975 both countries produced almost equal quantities of beef. The remaining countries, Romania, Hungary and Bulgaria, have also increased beef production. The most rapid rate of increase amongst them occurred in Bulgaria, which in 1975 produced 2.6 times more beef than in 1960, but in spite of this the total beef production is more than 2 times less than in Hungary and Romania. The volume of pork production during the five-year periods in most countries showed some fluctuations, although in all cases a positive trend was evident over the period as a whole. The USSR, Poland and the GDR were the principal producers, but if the number of people per square kilometer is taken into account, the production in Hungary, Romania and Czechoslovakia seems considerable. (See Figure 15) In 1975, the USSR produced 76.83% more pork than in 1960, Poland correspondingly, 52.42%, and the GDR, 64.77%. Bulgaria produced the smallest volume, but in relative terms it achieved the greatest growth, increasing production by almost 2 times. If estimated on an annual basis, the changes in pork production show considerable (compared with beef) fluctuations, because pork production in particular strongly depends on the supply of forage grain, especially corn feed, and also on market demand. The production of poultry has also rapidly increased. Various factors have influenced this situation. The most significant have been:

- The extensive possibilities for the application for modern industrial techniques;

- The volume of forage, particularly corn feed.

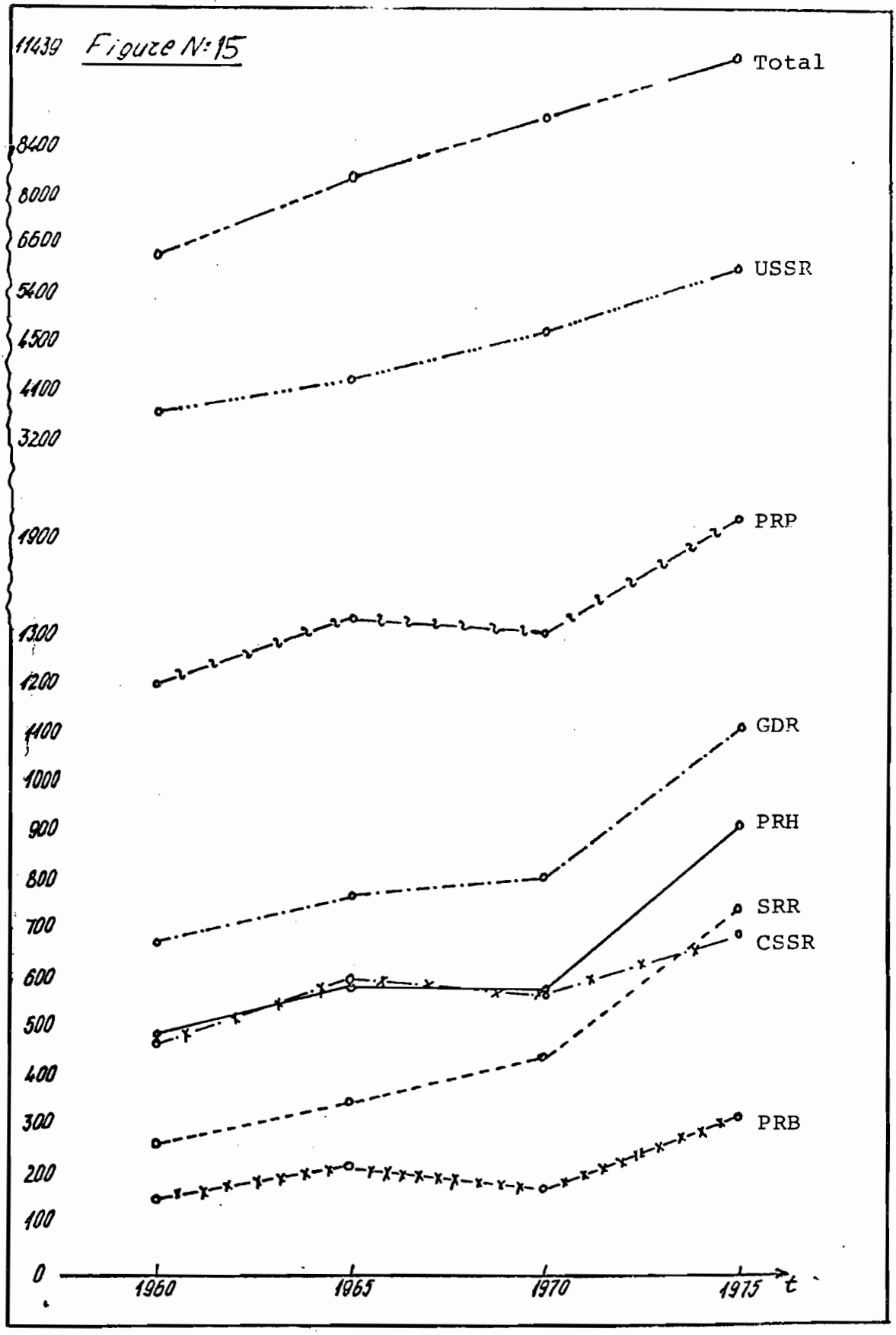
By taking advantage of these positive elements all the countries increased their poultry meat production. The greatest absolute volume was achieved by the USSR, but the highest growth rate occurred in Romania - 4.4 times, Poland and Bulgaria - 3.4 times. (See Figure 16) Contrary to pork and other kinds of meat production, poultry production has grown steadily in almost all countries in each of the five-year periods. In Bulgaria, Hungary and Czechoslovakia, however, growth took place more rapidly in the mid 1960s but in the USSR, Poland and particularly in Romania, this

BEEF PRODUCTION IN SLAUGHTERED WEIGHT (THOUSAND TONS)



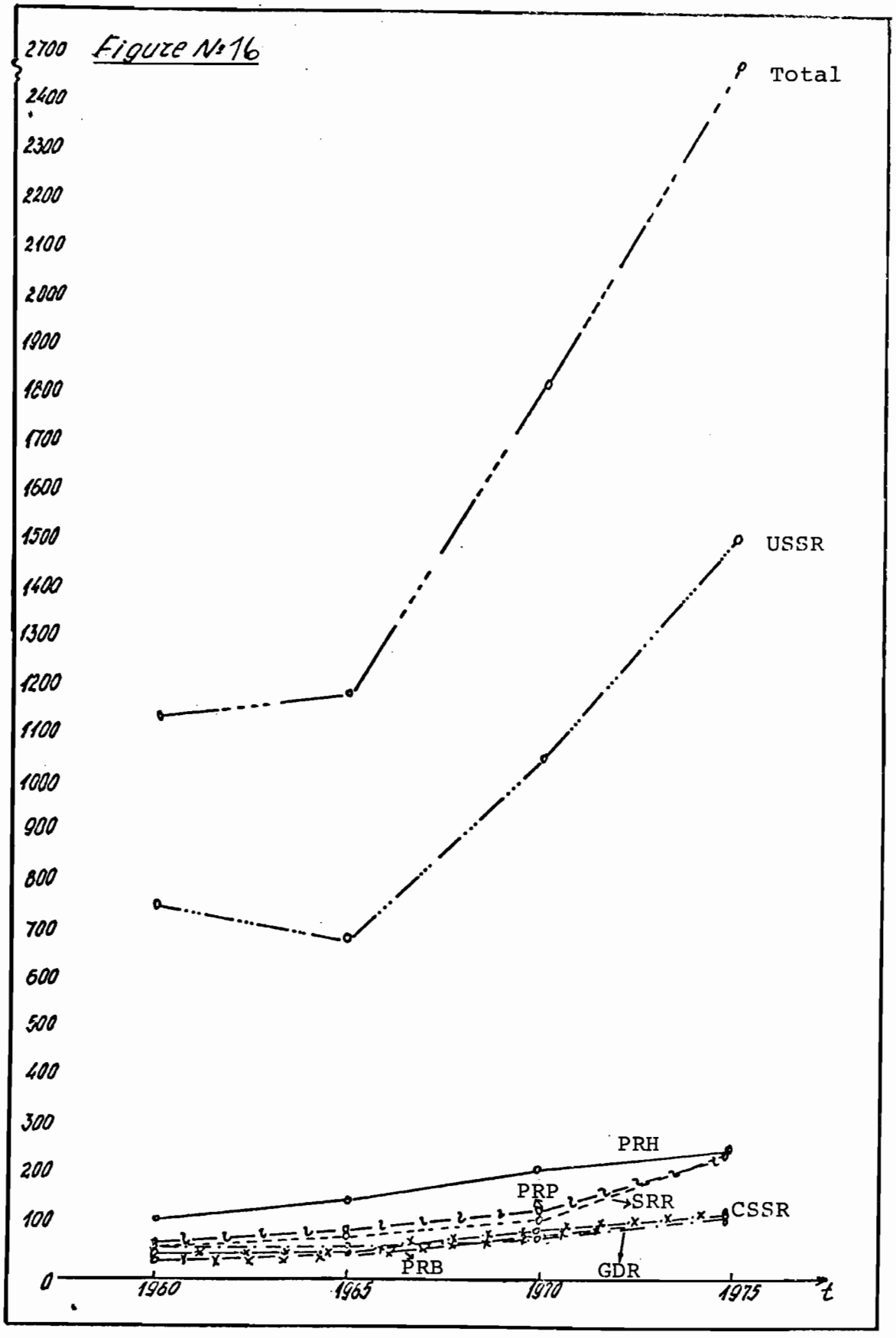
Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 69

PORK PRODUCTION IN SLAUGHTERED WEIGHT (THOUSAND TONS)



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 69

POULTRY MEAT PRODUCTION IN SLAUGHTERED WEIGHT (THOUSAND TONS)



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 69

growth occurred more rapidly over the last five-year period.

Milk production has shown a line of systematic increase. Quantities of milk (including all types, but primarily cows' milk) in the Community increased from 88,872 thousand to 128,341 thousand tons (44%). (See Figure 17) The largest producers of milk were the USSR, Poland and the GDR, Bulgaria achieved the highest rates of production growth - 51%. Milk production over the last ten years in most countries has increased steadily with the exception of Hungary.

The increasing milk production in the Community as a whole and in each individual country is a result of the increasing number of milking cows and the increasing milk yield per cow. During the individual periods, these two factors played a different role in each country.

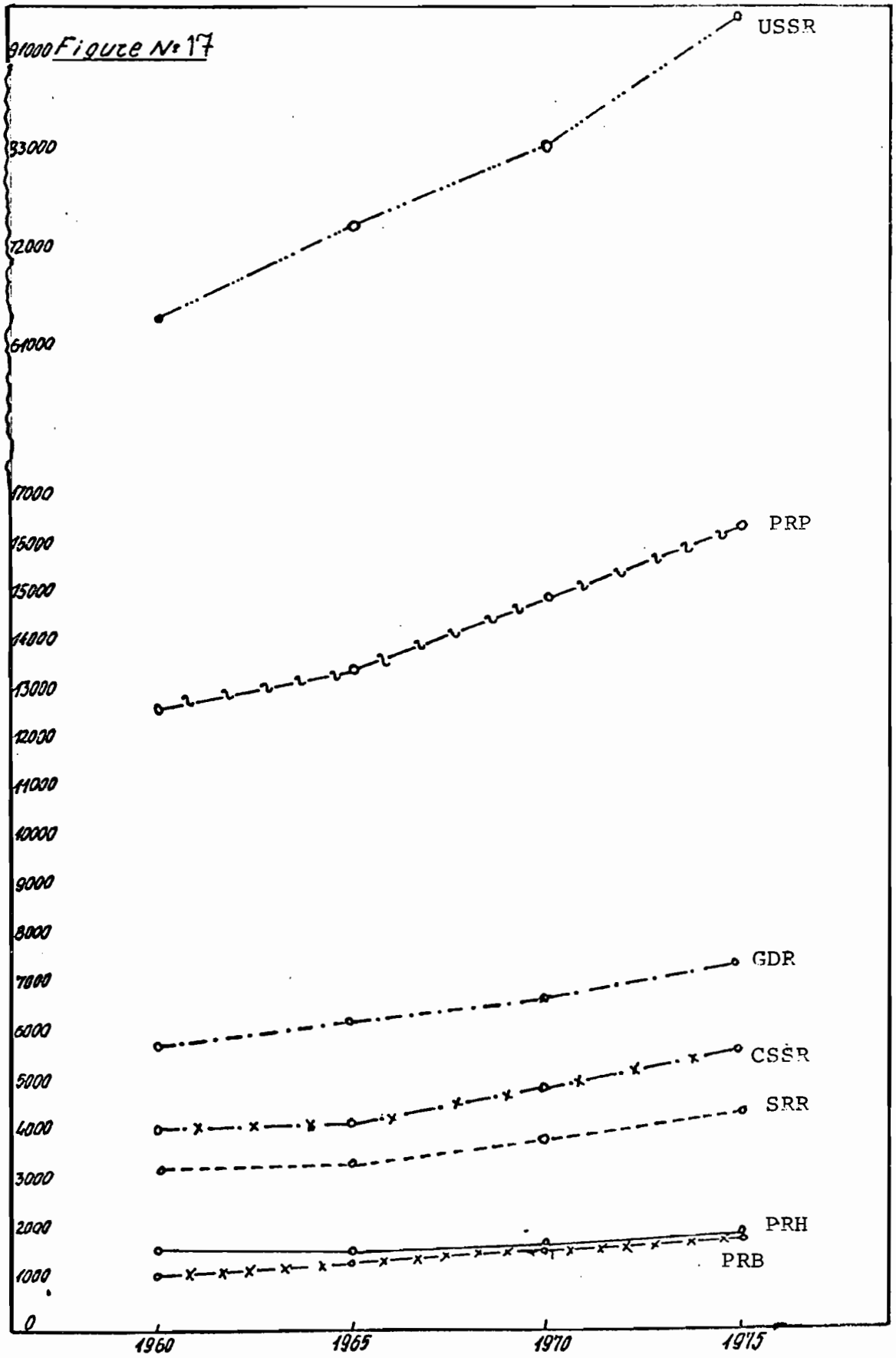
The final results show that both factors have been taken into account in the agrarian policy of the Community countries individually and as a whole. The number of milking cows in the state and cooperative farms decreased only when the productive qualities of new breeds were higher and the milk production continued to rise. In the private sector however this process was not realized in a systematic manner. As a result of this, in some cases, e.g. Hungary in 1971 and 1972, the sharp decrease in cows in the private sector caused a general reduction in milk production.

Concerning the characteristics of cattle reproduction, the state and cooperative leadership in CMEA countries implemented a policy to preserve the number of cows even though during the years of unfavorable natural and economic conditions they wished to decrease the number of cows. However in some countries (e.g.the GDR, Czechoslovakia, and partly the USSR and Hungary) particularly during the last five-year period, the percentage share of cows in the state and cooperative sector has rapidly increased, while those in the private sector have been sharply reduced.

Considerable growth is observed for the production of eggs. During the whole investigated period Community production has followed a constant line of growth, and has increased from 43, 239 million to 85,064 million eggs (96.09%). (See Figure 18) The largest and most rapid increase was achieved by the USSR,which produced in 1975 2.1 times more eggs than in 1960. Poland and the GDR were the next largest producers. Percentage wise both countries had almost the same growth rate - 43.37% and 43.7% respectively. The growth rates in the remaining countries were almost parallel. During the last ten-year period a permanent rise in egg production has been observed in the USSR, the GDR, Romania and Poland. Insignificant fluctuations took place, in individual years, in Bulgaria and Hungary, but this has not affected the general trend towards an increase. In relation to the size and territory of its population, Hungary has been one of the most important producers - almost 4 billion eggs.

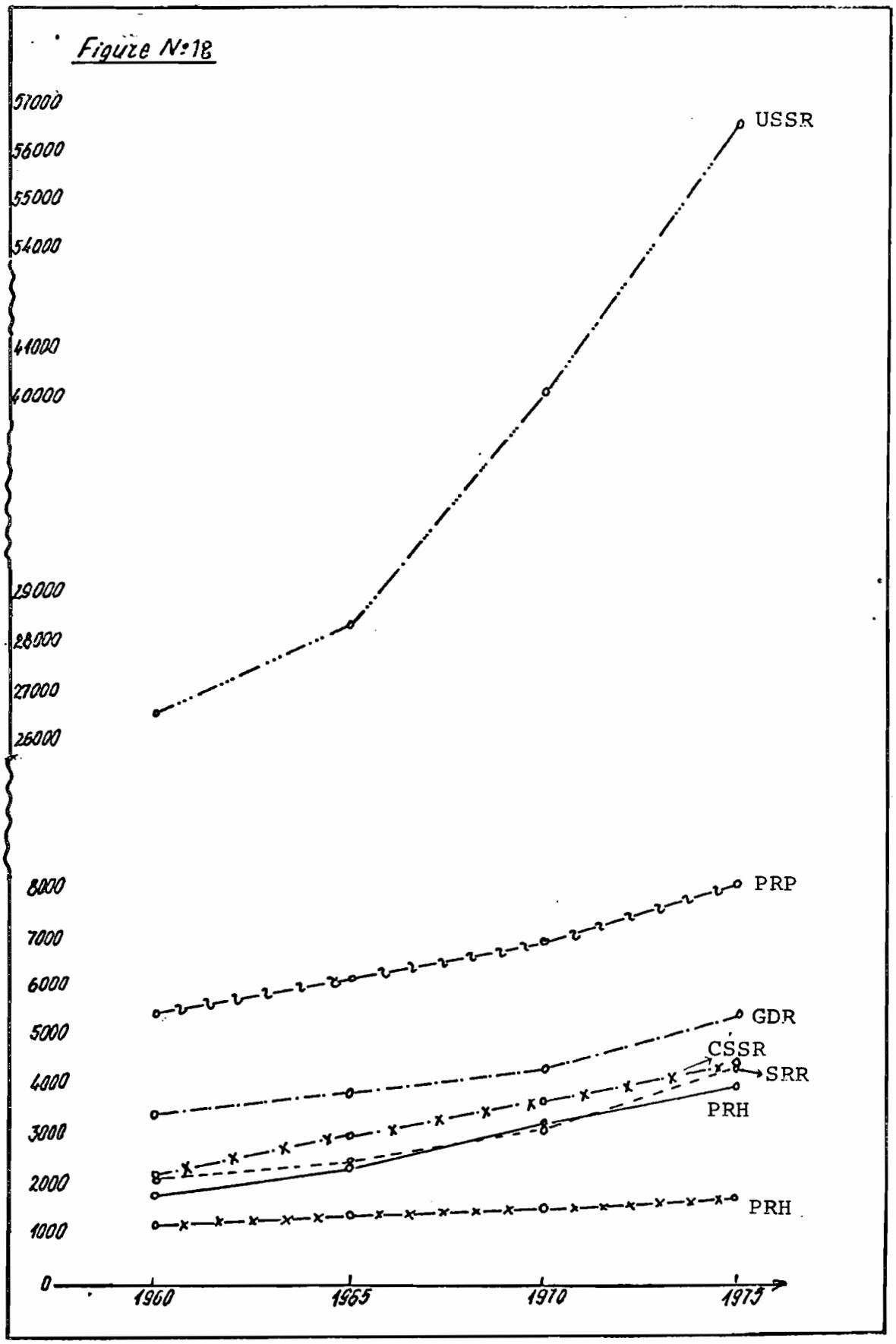
The proportionate share of influence of the state, cooperative and private or personal in the animal husbandry area sector varies from one sub-branch to another. In many of

MILK PRODUCTION (THOUSAND TONS)



Source: Статистичесикй ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 71

PRODUCTION OF HEN EGGS (IN MILLIONS)



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 71

the countries, particularly in the cattle sub-branch, state farms play a leading role in:

- the development and purchase of technical equipment;
- the improvement of the animals' productive qualities;
- the management of the production unit.

Cooperative and inter-cooperative farms play a similar role in the pig and chicken sub-branch. However in pig-and chicken-farming the personal farms, and in Poland private farms, also play a significant role.

The real and objective assessment of the data on the development of livestock in the various public sectors and types of socialist agricultural enterprises is interesting from the point of view of future assessments and forecasts since:

- the development of livestock production in a country becomes more stable as the share of the public (state and cooperative) sector increases in the corresponding subbranch;
- the material and technical base for the breeding of highly productive herds is dependent on the structural, organizational and economic conditions in the individual agricultural enterprises;
- the efficiency of the agrarian policy, carried out in each country is determined by the degree of direct or indirect state management and stimulation of the productive activities.

Livestock production of the European CMEA member countries assessed in these terms shows the rising role of the socialized sector.

In 1960 the state and cooperative sector produced smaller quantities of meat and fat (in slaughtered weight) than the personal sector. The percentage share was 45.95% of total national meat production. This sector also produced 58.64% of national beef production: 39.14% pork; 48.08% mutton and goat meat. In 1975 the percentage share of meat and fat produced in this sector increased to 60.94% of total meat production. The share of beef reached 73.71%; pork - 55.97%; mutton and goat meat - 57.79%. Over this period the percentage share of milk produced in the state and cooperative sector increased from 44.46% to 65.24% of total national milk production. Only in the case of poultry meat production and hen eggs was the percentage share in the state and cooperative sector still below that of the personal sector. Despite large increases this percentage only reached 46.25% and 48.34% of total national poultry meat and egg production.

The volume of eggs increased most considerably in the public sector; in the USSR by almost 7 times, in Romania by approximately 38 times and in Hungary by 21.8 times.

Analysis and assessment of the changes that took place show that livestock production in the agricultural enterprises of the public (state and cooperative) sector during the period increased at considerably higher rates than that of the private farms. This is due mainly to the underlined attention which the agrarian policies of these countries paid to the socialized economy, in improving breeding structures of herds, better living conditions (more hygenic utility buildings), in improved technical equipment, and veterinary-medical services, etc.

The increased sources of raw materials, the larger capital investment and the policy implemented to fully utilize available resources have all determined the rapid development of the food industry. (See Table 10)

In spite of the priority given to the development of heavy industry, and some of the most modern and progressive industrial branches, the attention paid to the food industry has been steadily expanding. The principal reason for this lies in the general policy for the optimal supply of the constantly increasing demands of the Community countries' population. An essential element of this policy is the general aim to achieve optimal nutritional levels in the next few years (not only quantitatively but also qualitatively). Two significant influences in the development of the food industry are evident:

- the new dietary habits of the population who now use more industrially prepared foods;

- the improved methods of preserving this processed food.

As a result of this influence all CMEA countries have enlarged the capacity of existing food processing factories, and have also built new modern ones. Both forms of ownership - state and cooperative - are involved in this activity.

Although priority has been given to state enterprises, some cooperatives have established their own processing plants producing tinned fruit and vegetables, jams, etc. in order to fully utilize their own raw materials (mainly vegetables and fruit). Large scale capital investment and raw material supplies are required for the building and operation of modern up-to-date factories having effective results. Therefore, in some cases it is necessary for several individual cooperatives to join together to form large intercooperative enterprises. [16,18,30,34,50]

Table 10

Indices and Average Rates of the Development of the Food Industry

Country	Indices of Gross State and Cooperative Food Industry Production (1970 = 100)				Growth Rates of Average Annual Gross Food Industry Production		
	1960	1965	1970	1975	1961-1965	1966-1970	1971-1975
Bulgaria	45	75	100	133	10.5	6.1	5.8
Hungary	57	79	100	125	6.8	4.7	4.6
GDR	72	82	100	130	2.9	4.0	5.4
Poland	70	86	100	153	4.4	2.9	8.9
Romania	48	73	100	143	8.7	6.5	7.5
USSR	53	75	100	130	7.3	5.8	5.4
CSSR	71	82	100	126	2.9	4.0	4.7

Source:

Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл.29 и 33.

The influence of the international market on food and other agricultural products has to be mentioned. In this respect a preference for tinned foods instead of fresh agricultural goods is shown. During 1961-1965 the most rapid growth in the food industry occurred in Bulgaria, Romania and the USSR. During 1966-1970, nearly all countries, with the exception of Czechoslovakia and the GDR, decreased their rates of development. However, over the last period, 1971-1975, a levelling in the growth of all countries has been observed. Poland is an exception; obviously in order to compensate for the low rate in 1966-1970. Romania increased its growth, although it did not achieve the level during the first five-year period. It is also evident that the food industry development of the principal three producers in the Community - the USSR, Hungary and Bulgaria - has continuously fallen during the last ten-year period, although not so sharply. The policy of the GDR and Czechoslovakia, throughout the whole period, followed a line of steady increase in an attempt to achieve rates equal to those of the remaining countries.

The production of processed meat increased from 315 thousand tons to 793 thousand tons. Total meat production increased from 6,923 thousand tons to 22,637 thousand tons. The production of processed fish increased 2.8 times. The quantity of processed vegetables increased 3.2 times, and that of tinned and bottled fruit and berries 2.5 times. Animal fats increased 69.33%, and vegetable oils more than 100%. Margarine production increased approximately 90% and sugar (in white sugar equivalent) 45.42%.

An analysis of the policy implemented in this branch shows that each country has pursued a different, but complementary program of food industry development. The USSR, for example, has concentrated heavily on the production of canned goods, and has increased processed vegetable production 3.4 times, tinned fish 3.4 times and preserved berries 2.7 times. Hungary has also increased production of processed meat by 5.2 times, processed vegetables by 3.8 times and preserved berries by 4 times. Poland has increased production of fresh meat (slaughtered weight) 2.3 times, processed fish 3.2 times, processed meat 3.8 times and unrefined vegetable oils 3.8 times.

In addition to the agricultural produce which forms the principal source of food supply of the population, the increased purchase of fish has also contributed considerably to the Community's diet. Fish already occupies an important place in the food structure of the Community, although it has not yet achieved the optimal percentage for the adequate nutrition of the population. The total catch of fish (ocean and fresh water) used in the food industry and for direct consumption during the investigated period has increased in

all countries from 3,889.6 thousand tons to 11,692 thousand tons. The greatest supplier was the USSR, which during 1975 caught 88.6% of the Community fish haul. Supply developed very rapidly in Bulgaria from 7.9 thousand tons in 1960 to 151 thousand tons in 1975 (an increase of 19.1 times), in Romania from 16 thousand tons to 130 thousand tons (8.1 times), and Poland from 187 thousand tons to 683 thousand tons (3.7 times).

3.2 Crop Yields and Productivity of Main Agricultural Crops and Livestock Rates and Tendencies.

The growth in average yields of the main agricultural crops and in the productivity of livestock has made a significant contribution to the increase in gross agricultural production within the Community.

In all the CMEA countries, with the exception of Poland, the period after 1960 was characterized by the completion of the total collectivization of agriculture in the form of large amalgamated agricultural enterprises - state and cooperative.

Intensification of plant-growing and animal husbandry became a basic element in the development of the countries' agricultural production, so that the agrarian policies were directed towards the creation of all necessary material, technical, economic, organizational and other prerequisites for further expansion of production intensification. The material and technical factors (highly productive techniques; modern technology; valuable varieties of crops and livestock breeds; etc.) were created by domestic industry within each country or by the industries of the whole Community based on an international division of labor, but contacts with the developed market economies have also been used through international trade and technical, scientific and other relations. The following organizational and economic factors have also contributed to the rapid increase in yields from the main agricultural crops in all countries:

- The creation of an optimal size in enterprises and their production units
- A more rational production and management structure.
- An improvement in the leadership and the training of skilled workers
- The supply of necessary specialists for agricultural production.

The average annual yield of cereals and pulse crops increased in Bulgaria, for example, to 33.1 cwt/ha in 1971-1975,

i.e. 74.21% more than during 1961-1965. In Hungary, this increase was correspondingly to 35 cwt/ha (72.4%), in the GDR 35.7 cwt/ha (41.1%), in Czechoslovakia to 33.9 cwt/ha (55.5%), in Poland to 25.1 cwt/ha (47.64%), in Romania to 24.1 cwt/ha (51.57%), and in the USSR to 14.7 cwt/ha (44.12%)[3]. (See Figure 19)

Wheat, barley and maize have shown the greatest increase in average yields. The production of these crops is necessary to solve the bread and grain-fodder problem in this region, and therefore the Community countries have given them priority. As a result of this the average yields of wheat increased in Bulgaria to 34 cwt/ha in 1971-1975 (87.84%). During the same period, Hungary, the GDR and Czechoslovakia increased their average yields of wheat to 33.2 cwt/ha (78.49%), 40.7 cwt/ha (29.21%), and 36.4 cwt/ha (51.03%) respectively. (See Figure 20) Record yields of wheat in the individual countries during the last five-year period were recorded in the GDR, Czechoslovakia and Hungary in 1974 - 43.3 cwt/ha, 39.7 cwt/ha, and 37.5 cwt/ha respectively; and in 1972 in Bulgaria - 37.3 cwt/ha.

The average yields of rye increased in Czechoslovakia to 28.6 cwt/ha (36.84%), in the GDR to 27.8 cwt/ha (31.13%), in Poland to 23.1 cwt/ha (40.85%), and in the USSR to 13.5 cwt/ha (46.74%). In 1974 the increased yields in the USSR and Poland, where rye was grown on a large scale, made a significant contribution to the bread balance. Record rye yields were recorded by Czechoslovakia and the GDR - 30.7 cwt/ha and 36.6 cwt/ha respectively.

The highest increases in average barley yields (the principal forage crop in this region) in 1971-1975 occurred in Czechoslovakia, the GDR, Hungary and Bulgaria: to 33.8 cwt/ha (an increase of 49.56%), to 40.4 cwt/ha (36.15%), 28.8 cwt/ha (64.93%), and 30.9 cwt/ha (50.73%). (See Figure 21) Over the last five-year period record yields of barley in the individual countries were reached in 1974. They were: Czechoslovakia - 38.9 cwt/ha, Bulgaria - 34.3 cwt/ha and Hungary - 33.1 cwt/ha.

The average yields of oats increased during the same period in the GDR to 35.6 cwt/ha (33.33%), in Czechoslovakia to 26.2 cwt/ha (38.62%), in Poland to 24.5 cwt/ha (43.27%), and in Hungary to 18.2 cwt/ha (62.5%). This crop does not have great economic importance in the other countries.

A significant increase was achieved in corn-maize production - the second important corn forage crop in this region. Yields were highest in Czechoslovakia, Hungary and Bulgaria. In Czechoslovakia they rose to 44.1 cwt/ha in 1971-1975 (67.68%), in Hungary to 41.7 cwt/ha (59.77%), in Bulgaria to 39.7 cwt/ha (52.11%), in the GDR 31.2 cwt/ha (57.58%). (See Figure 22) The record yields of corn-maize over the last five-year period in individual countries were reached in 1972:

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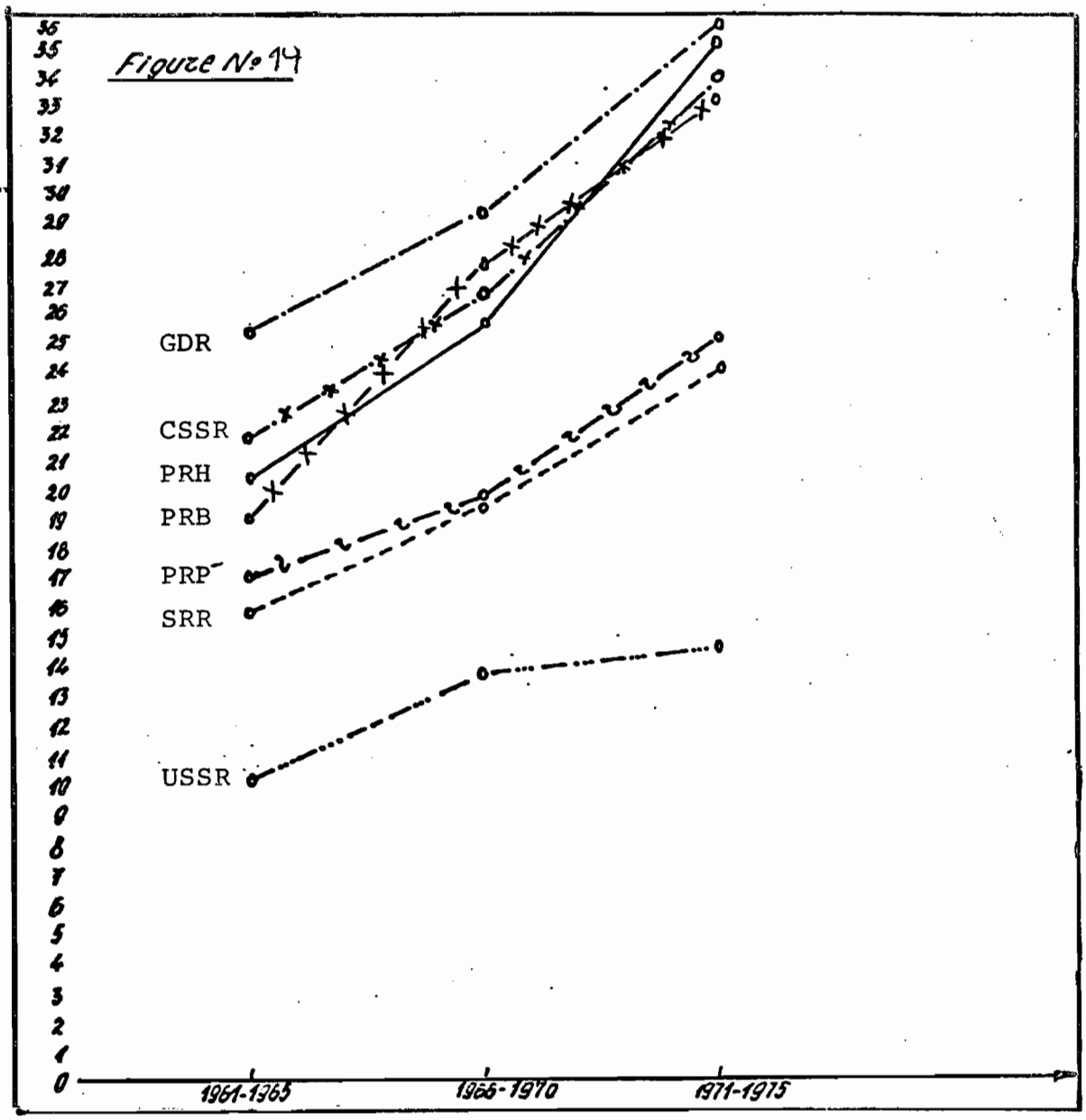
[3] 1 cwt = 100 kg.

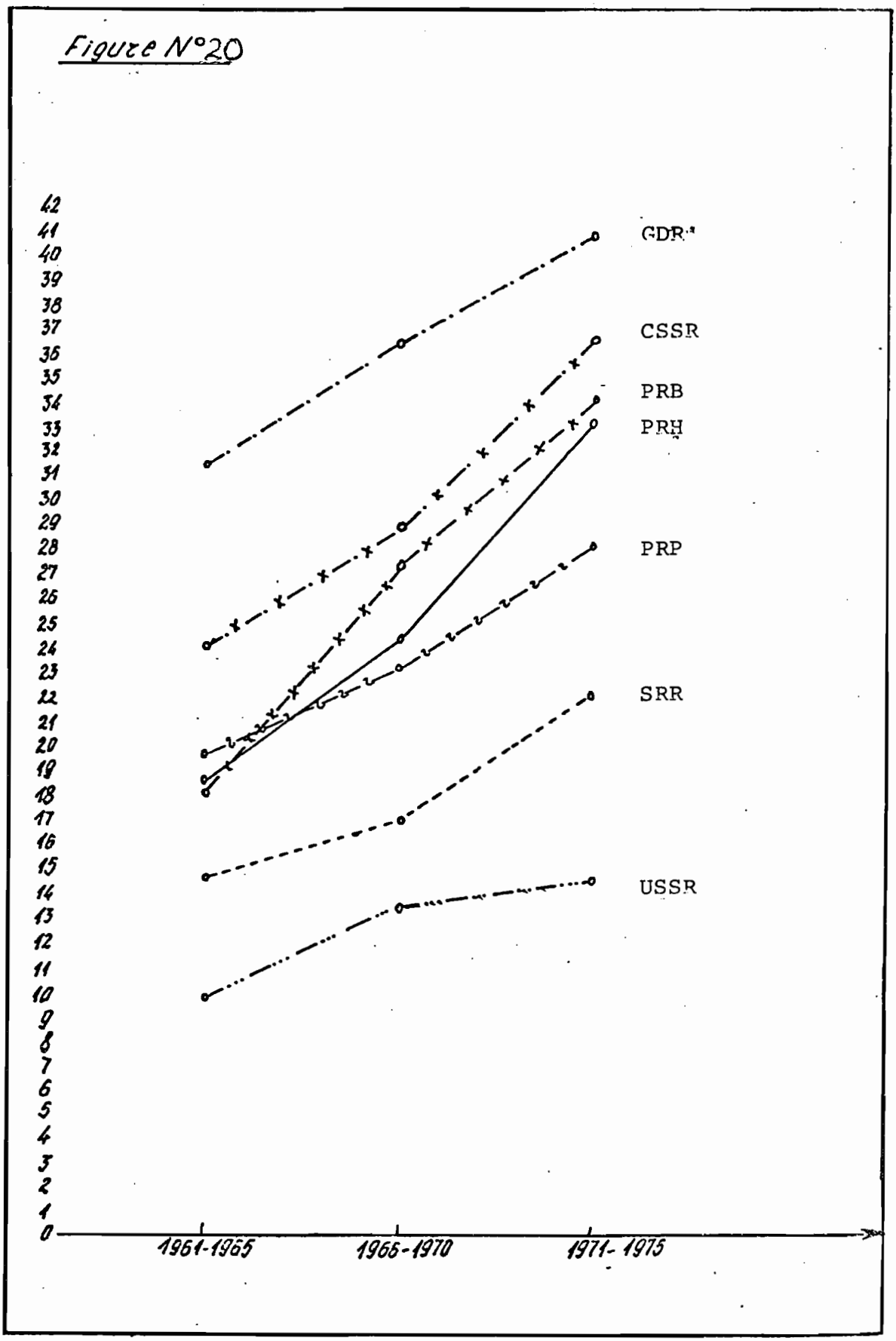
ANNUAL AVERAGE YIELDS OF CEREALS AND PULSE CROPS, CWT/HA



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 66

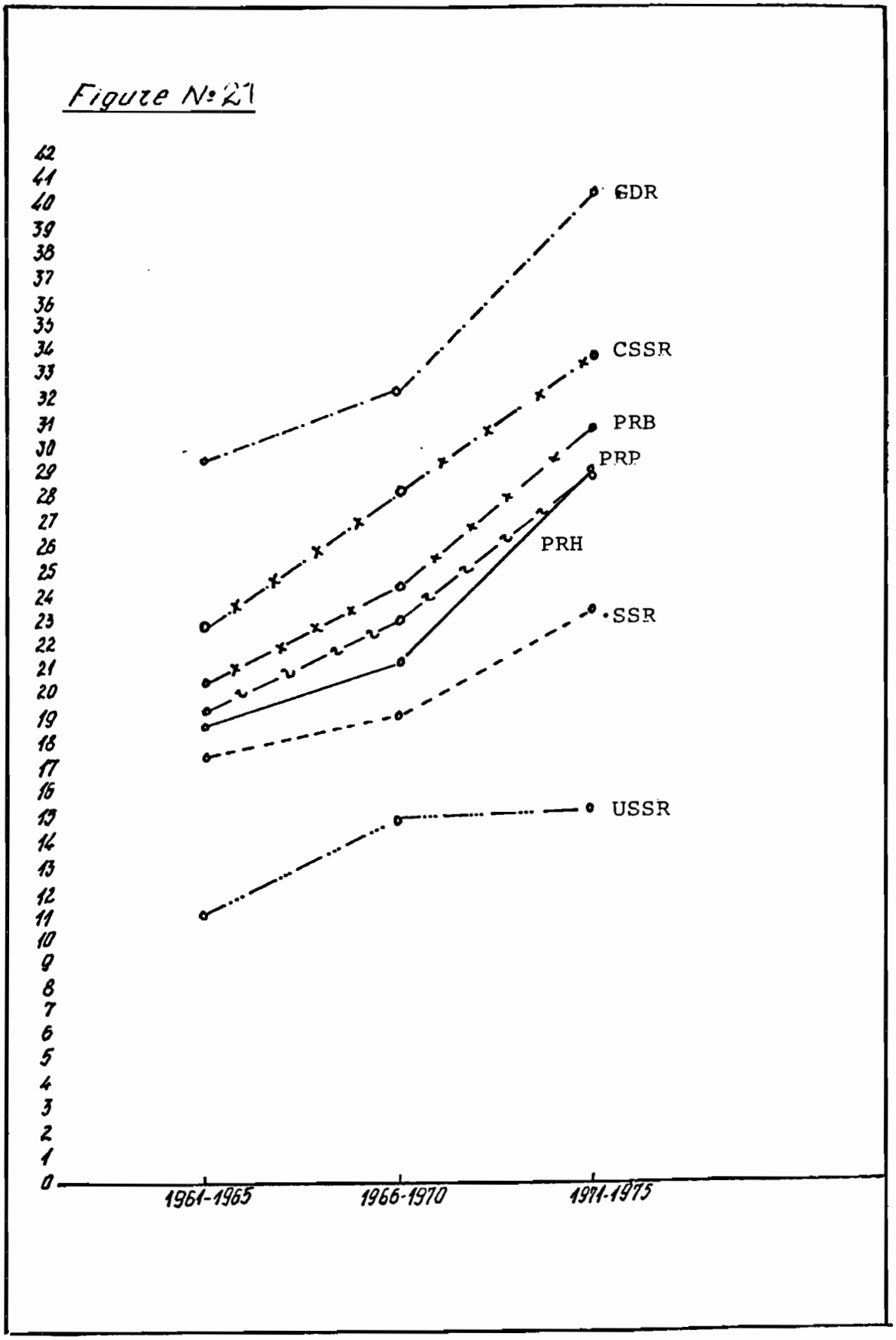
ANNUAL AVERAGE YIELDS OF WHEAT, CWT/HA

Figure N°20



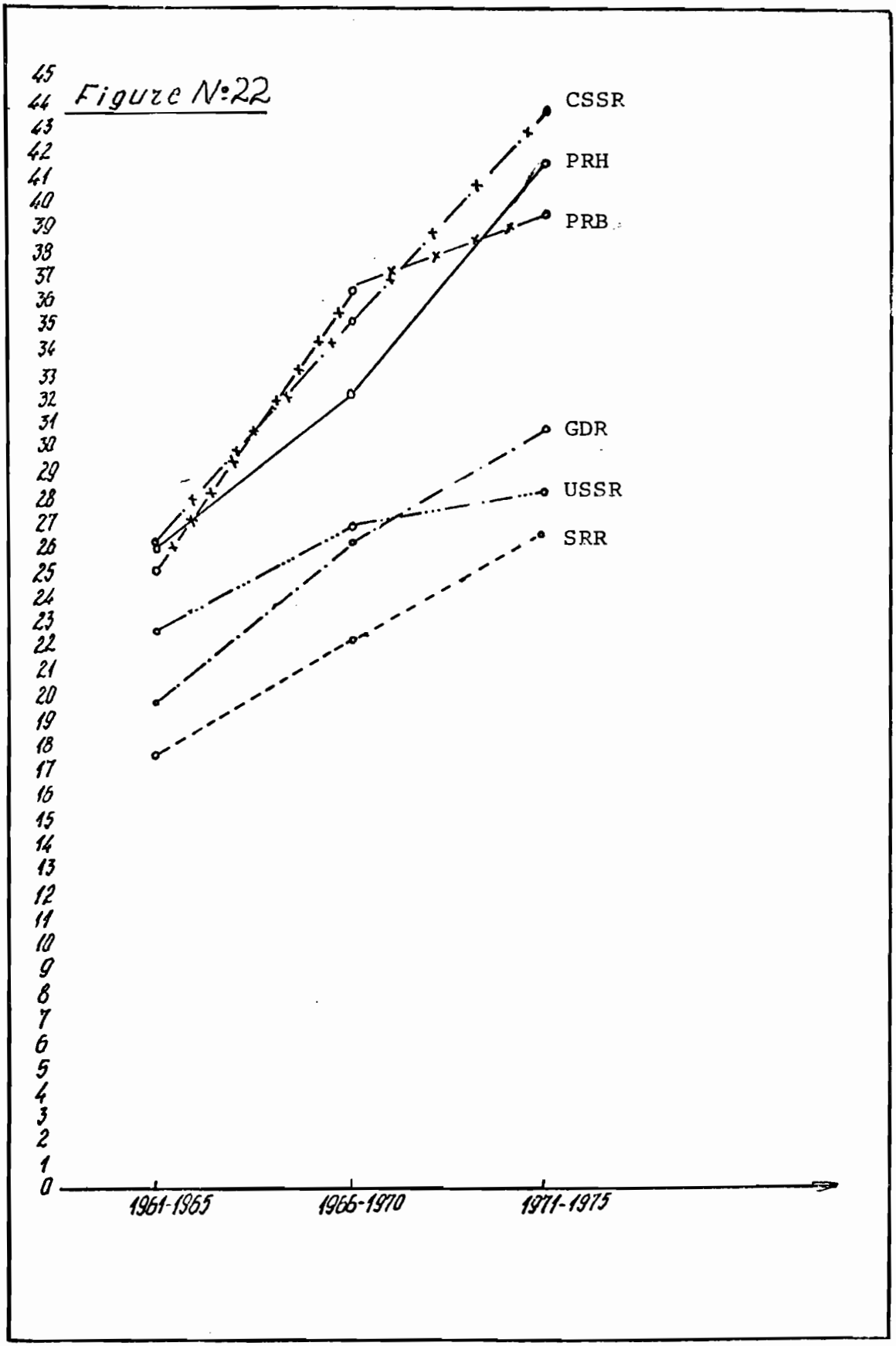
Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 66

ANNUAL AVERAGE YIELDS OF BARLEY, CWT/HA



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 66

ANNUAL AVERAGE YIELDS OF MAIZE (AS CORN), CWT/HA



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 66

in the CSSR - 44.4 cwt/ha and in Bulgaria - 43.1 cwt/ha. In Hungary this record was reached in 1974 - 42.4 cwt/ha.

The average yields of silage maize increased considerably in Poland, Czechoslovakia and the GDR. In Poland they reached 388 cwt/ha in 1971-1975 (38.19%), in the GDR 315 cwt/ha (5.7%), in Czechoslovakia 289 cwt/ha (44.5%). Record yields from this crop over the last five-year period were reached in 1972, in Poland - 446 cwt/ha, and in the GDR - 395 cwt/ha.

The steady increase of cereal and pulse crop yields was not a rare phenomenon, relating to this group of crops only. It was a trend which embraced the entire Community countries' plant-growing activities, but the growth rates of yields varied from one crop to another depending on two important conditions:

- The differences in techniques used;

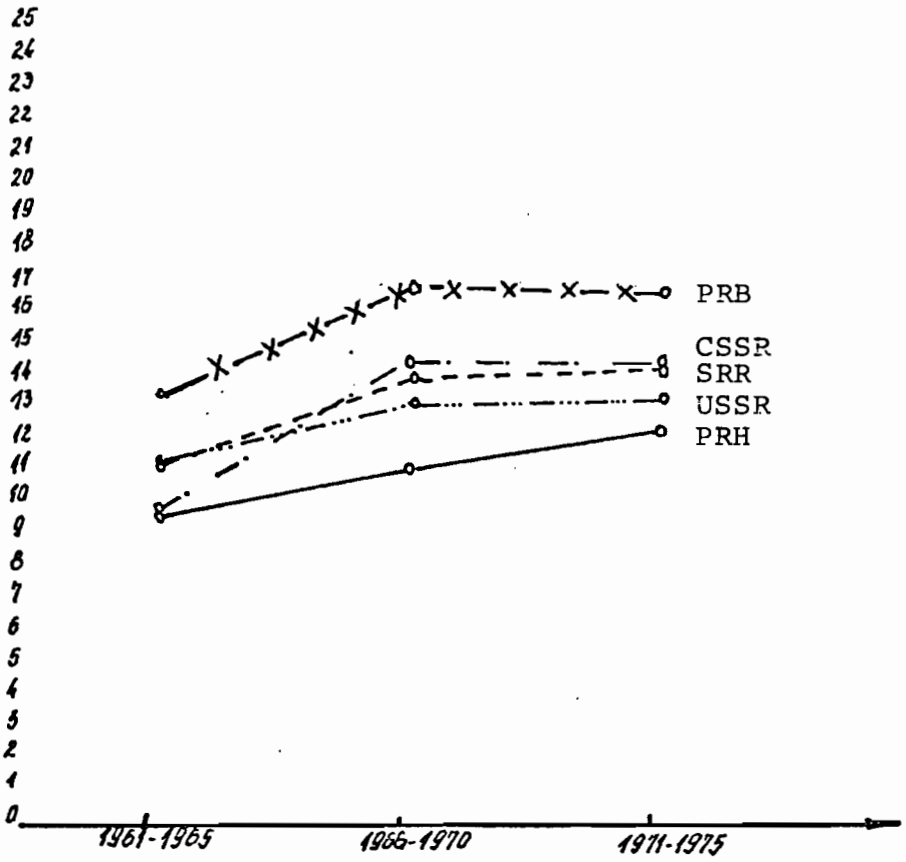
- The unequal possibilities for introducing new varieties.

The average yields of oil-bearing crops, which form a large proportion of the raw materials used by the food industry in almost all countries have shown a trend of steady growth. However, this growth rate was slower than that of the cereal and pulse crops. The highest average yields from these crops during the last five-year period were reached in the GDR, 22 cwt/ha (53.84% higher than in the period 1961-1965), in Czechoslovakia - 17.8 cwt/ha (74.5%),in Poland -17.9 cwt/ha (28.7%) and in Bulgaria - 16.7 cwt/ha (28.46%). Record average annual yields from these crops during the last five-year period in the separate countries were achieved in 1974 in the GDR - 23.6 cwt/ha,and in 1972 in Poland-19.7 cwt/ha, in Czechoslovakia - 18.5 cwt/ha, and in Bulgaria 17.5 cwt/ha. The high average yields in Czechoslovakia, Poland and the GDR can be primarily attributed to the grape seed yields (colza), and in Bulgaria to the sunflower seed. Although it is only grown in five of the European CMEA countries, the sunflower is the main oil-producing crop. It provides four-fifths of the entire oil production of the Community. During 1971-1975 the average yields of this crop were 26.69% higher than in 1961-1965. The average yields in Romania rose by 26.13%, and in the USSR, which is one of the greatest producers, by 17.86%. (See Figure 23) Record sunflower yields during the last five-year period in the individual countries have been achieved in Bulgaria - 18 cwt/ha in 1972, and in 1973 in Czechoslovakia - 16.3 cwt/ha, in the USSR - 15.5 cwt/ha.

Similar trends have also been observed for other industrial crops. There was an increase in sugarbeet yields in all countries. During the last five-year period Czechoslovakia, Hungary and Poland obtained average yields of over 300 cwt/ha. Yields were highest in Bulgaria and Hungary - 350 to 400 cwt/ha in individual years. Yields in Romania and

ANNUAL AVERAGE YIELDS OF SUNFLOWER, CWT/HA

Figure N°23



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 66

the USSR were smaller - 220 and 230 cwt/ha but the absolute rate of increase in yields in separate years was considerable 250-280 cwt/ha. Except in Romania and Hungary the annual average yields of this crop during the last five-year period were smaller than in the period 1966-1970. Record yields of sugarbeet over the last five-year period were achieved in 1977 in Czechoslovakia - 395 cwt/ha and in Hungary - 377 cwt/ha.

Potatoes are an important part of the population's diet in the European region, and in some countries they are also used as forage. The growth rate of yields has developed more slowly and with a certain uneveness from country to country. At the end of the period, Poland, the GDR and Czechoslovakia had the highest yields - 177, 171 and 153 cwt/ha respectively. (See Figure 24) Record yields were achieved in 1973 in Poland - 194 cwt/ha, and in 1972 in the GDR - 188 cwt/ha. These are the countries in which potato production played the most important economic role.

The Community's agrarian policy in the animal husbandry area has paid much attention to accelerating the development of milk production. As a result the yields of cows' milk during the five-year period showed a noticeable growth in all countries, with the exception of Romania. In the GDR this is clearly demonstrated over the whole period, where the yield increase in 1975 rose to 3,485 litres per cow, i.e. an increase of 30.57% above the 1960 level. In Czechoslovakia the milk yield was augmented rapidly at the end of the period - 55.21%. As a result of this Czechoslovakia outstripped Poland's milk production. The growth in Bulgaria was even more rapid. A 56.79% increase occurred in 1975,when yields of 2,264 litres per cow were recorded. Thus, as early as 1970, Bulgaria closely following behind Hungary, achieved a higher milk yield than the USSR. (See Figure 25)

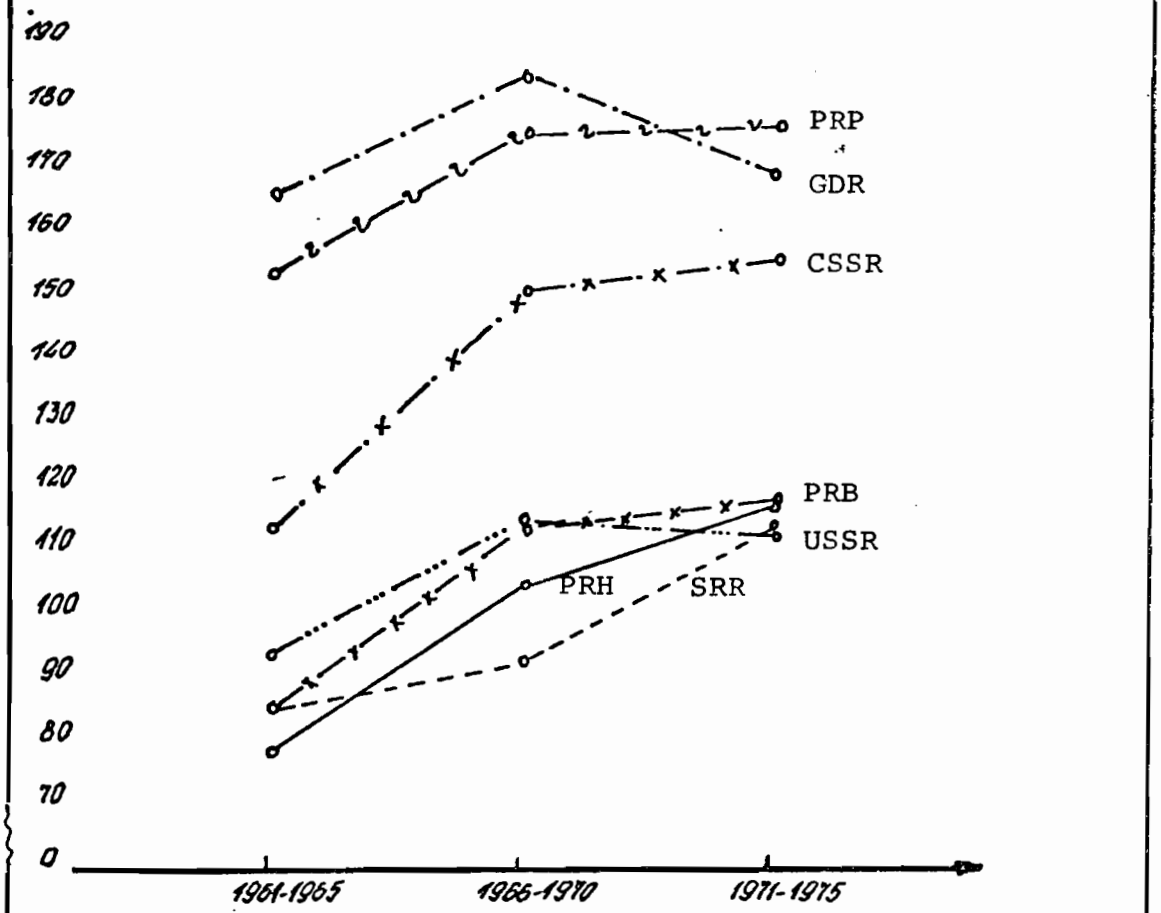
Despite the general progress attained in this branch, in most countries the result could not be considered satisfactory, particularly if the milk yields of the GDR are taken as a standard. The average yields have been influenced by two opposing groups of factors. The following conditions have had a positive influence:

- The improved genetic structure of the cattle herds;
- The more abundant supply of forage, particularly corn and root crops;
- The application of modern techniques in milk production.

The large numbers of cows on private and personal farms had a considerably negative impact on milk production. Milk yields in this sector were considerably lower than on the state and cooperative farms.

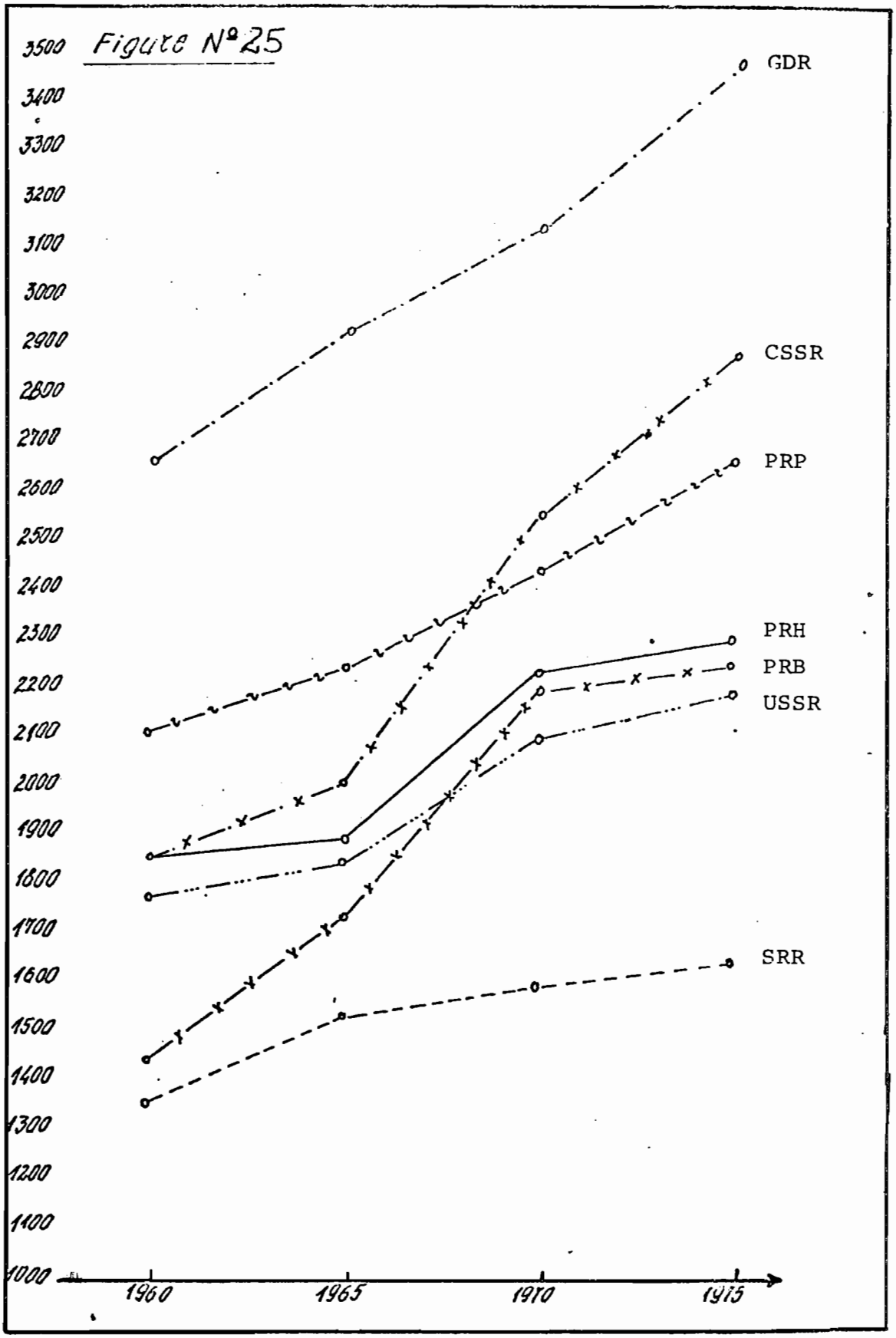
ANNUAL AVERAGE YIELDS OF POTATOES, CWT/HA

Figure No.24



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 66

AVERAGE MILK YIELDS PER COW IN KG. FOR ALL FARM CATEGORIES



Source: Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 73

The data on average yields and productivity of the main agricultural crops and animals in the European CMEA countries confirm that the policy encouraging further intensification in agricultural production was successful, and they prove the expedience of the structural, variety and breed changes realized over the whole period. These data also reveal the effectiveness of the policy concerning an extension and improvement of the material conditions and technical equipment of this vital branch.

This policy has yet another merit - it has enabled the majority of the CMEA countries in the last ten to fifteen years to catch up with those countries which have the highest yield indicators. Despite this success an analysis of average yields from the most important agricultural crops, wheat, barley, maize and others, shows regular, and sometimes considerable, fluctuations owing to climatic factors and inadequate technology and technical equipment in the production process (Lack of sufficient irrigated areas, unstable supply of chemicals, seasonal shortage of machines and other equipment, etc. have caused these fluctuations, which have to be estimated in the future.)

3.3 Level of Supply of Primary Food and Agricultural Products

The solution to the food problem one of the cornerstones of the agrarian policy of the centrally planned economies. It involves the concept upon which the socialist system itself is based.

The increased production capacities of agricultural enterprises in the Community are responsible for the fact that agricultural production growth has been more rapid than population growth. Thus, food and agricultural production per capita have increased considerably.

At this time, all of the countries have designed long-term programs for national economic development including agriculture and the food industry up to 1980 and 1990. The growth of cereals and pulse crops has formed an integral part of these programs. It has been of fundamental significance for feeding the population.

According to the calculations of Academician V.S. Nemchinov, in order to completely satisfy man's nutritional requirements, it is necessary to produce 1 ton of grain per capita annually. Average annual grain production in the European CMEA countries during the last five-year period approximated to the above level.

However this level is the minimum requirement per capita today in spite of the opportunities for using other kinds of natural and artificial substitutes for grain, particularly for livestock fodder. The per capita production of the basic plant

growing products can be seen in Table 11. The data demonstrates that in comparison with 1960 the greatest increase of cereals and pulse crops has been achieved in Hungary, the CSSR, and the GDR. Bulgaria and Romania showed moderate increases. Poland, and particularly the USSR where in 1975 the climatic conditions were unfavorable, have the smallest increases. However the average per capita production from 1971-1975 was considerably higher than in 1960 in all of the Community countries.

The greatest increase of per capita wheat and rye production was attained by Hungary and the CSSR. Moderate increases occurred in the GDR and Romania. Bulgaria showed a very small increase, but in the USSR and Poland reductions were evident.

All the countries, with the exception of Romania, produced an annual average of over 300 kg of wheat and rye during the last few years; this was sufficient to cover their needs. Romania traditionally consumes certain amounts of maize meal, so that the smaller quantities of per capita wheat and rye production did not affect the dietary requirements of the population there. Although the average production of bread - cereal crops during the last five-year period were sufficient to cover the populations' requirements in individual years when unfavorable climatic conditions occurred, the cereal production could not cover these requirements.

During such years the Community relied on potato production to compensate for the deficiency in cereals. Poland and the GDR had the greatest per capita production. Medium production was achieved in the USSR and the CSSR. The remaining countries had a low per capita potato production.

A simple comparison of the production quantities per capita does not however give a complete picture of the level of supply. First of all because a proportion of the potato crop in Poland, the GDR, and the USSR, was cultivated for fodder; the second reason is related to the traditional peculiarities of national diet, hence the role of potatoes varies considerably from country to country.

On the other hand, the per capita potato production has to be estimated together with vegetables. There were considerable differences in per capita vegetable production in each country. Very often these trends were contrary to those of potatoes. The vegetable indices were highest in Bulgaria and Hungary, they were moderate in Poland, Romania and the USSR, and comparatively low in the GDR and the CSSR. In 1975, Bulgaria decreased these per capita quantities, but the average annual yield of vegetables during the last five-year period was nearly as high as the 1960 level.

Table 11

Production of Basic Plant-growing Products per Capita (in kilograms)

Country	Year	Cereal and Pulse Crops	Wheat and Rye only	Potatoes	Vege-tables	Fruit (fruit crops & berries)	Grapes only
People's	1960	638	313	60.8	189.0	152.0	74.9
Republic	1965	654	363	34.7	173.0	271.0	163.0
of	1970	815	360	44.0	177.0	274.0	123.0
Bulgaria	1975	893	320	36.4	158.0	229.0	102.0
People's	1960	713	214	301.0	120.0	123.0	49.2
Republic	1965	754	271	174.0	131.0	128.0	42.1
of	1970	752	279	175.0	135.0	198.0	71.8
Hungary	1975	1173	394	155.0	139.0	206.0	77.1
German	1960	376	208	860.0	45.8	73.8	—
Democratic	1965	404	218	755.0	56.5	31.0	—
Republic	1970	383	212	765.0	72.7	32.0	—
	1975	533	255	455.0	58.4	38.2	—
People's	1960	511	343	1274.0	113.0	40.2	—
Republic	1965	525	366	1355.0	117.0	19.2	—
of	1970	511	309	1546.0	129.0	36.6	—
Poland	1975	583	337	1365.0	121.0	40.6	—
Socialist	1960	548	193	164.0	99.4	93.3	47.5
Republic	1965	673	319	115.0	87.0	109.0	48.4
of	1970	536	168	102.0	98.9	95.0	38.0
Romania	1975	724	231	128.0	119.0	107.0	56.0
USSR	1960	586	376	394.0	77.0	23.1	87.1
	1965	525	328	384.0	76.0	35.1	16.1
	1970	769	464	399.0	87.0	48.2	16.5
	1975	551	296	349.0	92.0	56.0	21.3
CSSR	1960	430	176	373.0	84.3	66.4	4.1
	1965	384	199	260.0	71.7	21.0	2.8
	1970	509	253	334.0	79.6	50.7	9.6
	1975	637	320	241.0	75.2	41.6	14.1

Source:

Статистический ежегодник стран-членов СЭВ,Изд. Статистика, М., 1976, табл. 74

Hungary has increased per capita vegetable production and has almost reached the Bulgarian level during the last five-year period. Poland correspondingly increased production, although with some fluctuations. After the decrease in 1965 and 1970 Romania also followed a pattern of further production growth over the last five-year period. A constant line of increase appeared in the USSR. Only in the CSSR did the per capita vegetable production decrease latterly. The average annual production during the last five-year period showed that this decrease has ceased. The rising importance of vegetable production in the Community has been determined mainly by the increased demand on the national and international markets. In this branch the advantages of the international division of labor are most clearly displayed. Owing to favorable natural conditions and accumulated expertise in vegetable cultivation, some member countries have been able to produce higher quality goods with lower capital expenditure.

The effects of the labor distribution process are clearly seen in the fruit-growing sector (including grapes and berries), where per capita production was very high in Bulgaria, Hungary, Poland and to a lesser extent Romania. In the GDR, the CSSR, and the USSR yields were considerably smaller. Production in Bulgaria was greatly increased at the beginning of the period under investigation, and, although it has decreased over the last few years, it is still high - 246.6 kg during 1971-1975. Hungary has increased production mainly during the mid 1960s and has an average annual yield over the last five-year period of 210 kg. In Romania some variations in yields have been evident, but in 1975 production was greater than in 1960. Amongst the remaining countries, the USSR has followed the most constant policy for per capita fruit production which has increased much faster than in other countries - more than 2 times. At the same time the CSSR and the GDR, which produce smaller quantities of fruit per capita have continued to decrease production and Poland has maintained a constant level of production over the whole period.

Per capita grape production has had a strong influence over the fruit sector as a whole. Bulgaria, which is the most specialized country in this sector, increased grape production rapidly over the 1961-1965 period. In 1975 yields were lower because of the unfavorable climatic conditions which affected the annual average for the last five-year period. Hungary, also highly specialized in grape production, increased the per capita annual average during the last two five-year periods. The development of grape production in Romania shows some fluctuations, but there has been a steady increase from 1971 to 1975.

The individual countries vary in the type of grapes they produce. Some of them concentrate on wine-processing, while others mainly cultivate grapes for direct consumption. Therefore the average data for per capita grape production does not reflect the true level of self-sufficiency in grapes for direct consumption. In Bulgaria grapes for direct consumption form about 50% of the total grape production, while in Romania and Hungary they are utilized mainly for wine. Owing to favorable soil and climatic conditions in some southern republics in the USSR and in some other regions, e.g. the CSSR, the per capita grape production in the last two years has increased. The largest proportion of yields have been used for wine production.

Great emphasis has been placed by the Community agrarian policy on the second largest agricultural branch - animal husbandry. The progress achieved in this sector has had a favorable impact on the per capita production of the principle meat products. Data for per capita meat and fat quantities over the 15 year period show in most cases a trend towards rapid growth. (See Table 12)

Although the various countries commenced meat and fat production at different levels, they have all achieved an increase, but those countries with smaller indicators at the beginning of the period have experienced the most rapid growth rate, so that the differences in quantities produced between the various countries have now decreased from 1:2.68 to 1:2.35. Hungary had the greatest per capita production over the whole period. Meat and fat production in the GDR has also increased very rapidly and at the end of the period it took second position after Hungary.

However, Bulgaria had the highest growth rate which increased almost 2 times over the whole period. At the end of the first five-year period, it had overtaken Romania and the USSR and this advantage was maintained.

During individual years each CMEA country has not maintained a constant position in the meat and fat production structure. None of the countries have decreased their production growth, so that the meat and fat supply has increased despite the population growth in each country.

The largest per capita quantities of meat and fat (in slaughtered weight) were produced during 1971-1975: Hungary 125.2 kg., the GDR 89.1 kg, the CSSR 88.1 kg, and Poland 81 kg. The figures for Bulgaria, the USSR and Romania were comparatively smaller - 66.5 kg, 56.2 kg, and 55.5 kg.

Table 12

Production of Basic Livestock Products per Capita (in kilograms)

Country	Year	Meat and Fat (in slaughtered weight equivalent)	Milk	Hen eggs (number)
Bulgaria	1960	39.0	142	153
	1965	56.6	169	171
	1970	56.0	192	186
	1975	75.3	207	208
Hungary	1960	81.7	166	185
	1965	91.5	155	236
	1970	101.0	167	317
	1975	140.0	174	380
GDR	1960	59.2	335	204
	1965	66.1	369	231
	1970	74.5	396	260
	1975	102.0	440	300
Poland	1960	58.9	426	188
	1965	63.9	428	199
	1970	67.1	461	213
	1975	90.0	482	236
Romania	1960	30.5	182	118
	1965	34.5	176	128
	1970	42.3	193	158
	1975	62.5	216	234
USSR	1960	40.5	288	124
	1965	43.2	315	124
	1970	50.6	342	165
	1975	59.5	357	223
CSSR	1960	58.8	300	166
	1965	69.0	296	212
	1970	76.6	347	260
	1975	91.1	376	304

Source:

Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 74

A similar tendency is evident in per capita production of milk, which increased without exception in all countries.[3] Growth rates have been more rapid in the GDR, Bulgaria and the CSSR. Consequently by the end of the period Bulgaria had overtaken Hungary. The GDR was closely following Poland; and the CSSR had overtaken the USSR. The highest indices of per capita annual averages during the period 1971 - 1975 belonged to Poland with 481.2 kg. and the GDR with 424.6 kg. The indicators of the CSSR and the USSR were 371.8 kg and 350 kg respectively. Romania, Bulgaria and Hungary produced 209.2 kg, 200.2 kg, and 169.4 kg during the same year.

Taking into account national peculiarities in diet, Poland and the GDR were self-sufficient in milk and dairy products, therefore a further increase in milk production in these countries will probably take place more slowly. The CSSR and the USSR will need to achieve moderate rates of increase, but Hungary, Bulgaria and Romania will have to increase production rapidly.

The per capita production of hen eggs has also increased in all CMEA countries. Poultry-farming has been one of the most rapidly developing branches of animal husbandry in the Community. This has influenced the volume of poultry meat, and egg production. The most significant achievement in this branch has taken place in Hungary, the GDR, and the CSSR. The average annual per capita egg production for the last five-year period in Hungary was 337, in the CSSR 293, in the GDR 277, in the USSR 203, in Romania 203 and in Bulgaria 199.

In all countries from the first group (Hungary, the CSSR, and the GDR) egg production exceeded demand. Any further increase in hen egg quantities in these countries will be determined mainly by population growth and by the export possibilities. The second group of countries, however, will have to solve this problem in the future, especially Bulgaria and Romania, which have a large egg export trade. The increased national and per capita production of basic plant-growing and livestock products, and the import opportunities (from socialist and non-socialist countries) have determined the increasing consumption of meat and meat products. (See Table 13[4])

Of the plant-growing branches grain products, vegetables and potatoes are the most important for the population's nutrition in this geographic region. In some countries towards the end of the 1950s (Bulgaria, the USSR, Poland, and to a certain extent Hungary), bread and bread products played a considerable role in national diet, satisfying the necessary caloric intake and maintaining the essential protein balance.

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[3] All data are for milk with at least 3.5% butterfat content.

[4] Data for Romania is not available.

Table 13

Consumption of Main Foodstuffs per Capita (in kilograms)

Country	Year	Grain Products (in flour equivalent)	Vegetables (in fresh equivalent)	Potatoes	Meat, including offal, fat meat products (in meat equivalent)	Fish and fish products	Milk and milk products, includ. butter (in fresh milk equivalent)†	Hen eggs (number)	Vegetable oil	sugar & sugar products (in white sugar equivalent)
Bulgaria	1960	190	122.0	34.8	32.7	2.0	126	84	9.6	17.7
	1965	193	113.0	28.9	43.1	3.2	137	100	11.0	22.3
	1970	174	118.0	25.9	43.7	5.2	161	122	12.5	32.9
	1975	157	127.0	23.1	60.6	5.9	198	146	14.1	32.5
Hungary	1960	133	84.1	97.6	47.6*[2]	1.5	114**[5]	160	0.8	26.6
	1965	136	76.7	84.3	51.6	1.6	97	188	1.2	30.1
	1970	124	83.2	75.1	57.6	2.3	110	247	1.9	33.5
	1975	118	165.0†[1]	65.0	70.5 [3]	...	125	270	4.6[4]	39.5
GDR	1960	102	60.7	174.0	55.0*[2]	...	—	197	2.2	29.3
	1965	100	63.8	157.0	58.7	9.1	—	211	2.7	30.1
	1970	97.3	84.8	154.0	66.1	7.9	—	239	2.2	34.4
	1975	94.2	96.6	142.0	77.8	8.5	—	268	2.2	38.3
Poland	1960	145	...	223.0	49.9	4.5	363	143	1.0	27.9
	1965	141	...	215.0	56.0	5.0	367	162	1.3	32.6
	1970	131	98.0	190.0	61.2	6.3	413	186	1.5	39.2
	1975	120	94.0	173.0	78.0	7.2	432	209	2.1	43.0
Romania	1960	—	—	—	—	—	—	—	—	—
	1965	—	—	—	—	—	—	—	—	—
	1970	—	—	—	—	—	—	—	—	—
	1975	—	—	—	—	—	—	—	—	—
USSR	1960	164	70.0	143.0	40.0	9.9	240	118	5.3	28.0
	1965	156	72.0	142.0	41.0	12.6	251	124	7.1	34.2
	1970	149	82.0	130.0	48.0	15.4	307	159	6.8	38.8
	1975	141	87.0	120.0	57.0	16.8	315	215	7.9	40.8
CSSR	1960	126	63.1	100.0	56.8*[2]	4.7	173**[5]	179	4.1	36.3
	1965	130	76.7	93.0	61.7	4.9	180	228	5.0	37.5
	1970	113	76.3	103.0	71.9	5.2	196	277	5.8	37.7
	1975	107	78.0	98.0	82.0	5.6	212*	285	6.1	38.5

* Excluding fat

** Excluding butter

† Vegetables and fruit

Source:

Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 24

1 The vegetables column for Hungary for 1975 includes fruit

2 The meat column in Hungary, the GDR and the CSSR excludes fat

3 The meat column in Hungary for 1975 includes fish and fish products

4 The vegetable oil column in Hungary for 1975 includes margarine

5 The milk and milk products column in Hungary, the CSSR excludes butter.

At the beginning of the 1960s the consumption of grain products (in flour equivalent) decreased, and this was very evident after 1965. During 1966-1975, the food balance in all of the member countries underwent definite changes. The consumption of animal products, meat and meat products, milk and dairy products, fish products, eggs, vegetable oils, etc. generally increased, which resulted in a decrease in the consumption of bread and bread products.

The consumption of bread and bread products decreased 17.43% in 1975 in Bulgaria; 14.02% in the USSR; and 17.24% in Poland. It was also decreased, although only slightly, in the GDR, the CSSR and Hungary, where the consumption at the beginning of the 1960s was still comparatively low. This low consumption in some countries was counteracted by potato consumption. However, during the investigated period despite some fluctuations a generally decreasing trend was evident. In 1975, potato consumption was quite high in Poland, the GDR and the USSR. It was moderately high in the CSSR, comparatively low in Hungary, and very low in Bulgaria.

The decrease in bread and flour products and also in potato consumption in all these countries was accompanied by an increase in the consumption of animal products. During the period 1960-1975 most of the CMEA countries rapidly raised the living standards of their populations. First of all this caused qualitative changes in national diet; consumption of carbohydrate foods decreased and was substituted by an increase in animal protein consumption.

The most considerable changes in consumption patterns have occurred in the meat, and meat products sector, particularly in those countries which had low levels of meat consumption at the beginning of the period. Despite this growth some countries have still not attained the optimal level of national self-sufficiency. The low consumption of meat and meat products was compensated for by other products such as fish, milk, eggs, and vegetables. The USSR had a high consumption of fish and fish products over the whole period. Poland and Bulgaria achieved a considerable increase. In comparison with 1960 the GDR had a marginal decrease, however, the consumption level remained relatively high. The per capita consumption of milk and milk products was the highest in Poland and the USSR. It was moderate in the CSSR. Despite the increases during the last few years in the other countries, production has not yet reached a level of national self-sufficiency.

The changes in egg consumption patterns have reflected the steady production increase in all CMEA countries. The traditionally large consumers of eggs have been the CSSR, the GDR and Hungary. Consumption in Poland and the USSR has been more moderate. Bulgaria had the lowest consumption rate.

The vast differences in vegetable oils consumption in each country is again mainly due to the peculiarities of national diet and climatic conditions. This consumption has been particularly high in Bulgaria and the southern republics of the USSR. In the CSSR vegetable oil consumption is moderate and in the remaining countries, the GDR, Hungary and Poland, the utilization of vegetable oils is low due to the traditional use of butter for culinary purposes.

Consumption of sugar and sugar products (in white sugar equivalent) have increased constantly in all countries, rising most rapidly in Bulgaria, Hungary and Poland; at the beginning of the period these countries consumed the smallest quantities.

Stabilization of consumption in the CSSR, the USSR, and the GDR at 38-40 kg per capita during the last few years indicates that this level could be considered as more than optimal for this geographic region.

A general assessment of the development of agriculture and food production and consumption in the Community over the whole period shows the policy implemented in the individual countries has achieved many positive results contributing to healthier national diets. However some problems still remain. During the current five-year period there will undoubtedly be a further raising of the living standard in CMEA countries with further changes in national diet patterns. Demand for animal protein will increase, together with fruit, vegetables, vegetable-oils, etc. During this stage such rapid growth in consumption cannot be expected. In the future only part of the increased production in plant-growing and stock-breeding will be used to cover domestic and Community demands. The remainder will be directed towards international markets.

Therefore, the problems of great importance to all CMEA countries are:

- To forecast and model the food requirements of each country most comprehensively and precisely;

- To fully realize the possibilities for self-sufficiency;

- To assess future international demand.

IV. THE MAIN AIMS OF THE CMEA AGRARIAN POLICY. COMMON AND SPECIFIC CHARACTERISTIC FEATURES. THE MOST IMPORTANT RESULTS.

4.1 Main Aims and the Most Important Results of the Agrarian Policy Implemented During the Period 1960-1975.

The CMEA countries' agriculture in the period after the Second World War was developed under conditions of steady expansion and improvement of the socialist sector (state and cooperative) in agricultural production.

The policy of socialist sector consolidation in the USSR, where socialist ownership of production means and socialist forms of organization and management of this production prevailed prior to the Second World War, finds expression in the creation of more effective forms of organization and the introduction of more efficient economic methods of planning and management of the enterprises' production activities. In the rest of the Community countries, completion of the socialist reconstruction of agriculture, and the financial, economic and organizational consolidation of the new socialist (state and cooperative) enterprises was the primary task of their agrarian policy. It was first of all concerned to establish enterprises of an optimal size and production structure, to improve the organizational forms and to create more effective methods for management.

The general course of the agrarian policy in all countries during this period has been towards large-scale agricultural production.

International experience has shown the inability of small-scale agricultural enterprises to solve the important problems (of national, regional, and world dimensions) of food production. At the present time, they do not have the resources to undertake the considerable capital investment essential to their development. They cannot provide the necessary amount of qualified manpower, and they are not able to organize and manage agricultural production applying modern scientific and technical methods. Small-scale enterprises cannot develop at the rate of large-scale industry and other related branches, i.e. construction, transportation, etc. Therefore it contributes on the one hand to an extension of the imbalance between the rapidly developing industry, construction, and transportation branches, and others within the material and non-material sphere, and on the other hand to the slower development of agriculture.

Amalgamation of agricultural production by the creation of the socialist state and cooperative enterprises has been accomplished over a relatively short period. It has been carried out in a systematic manner and relies upon the state for its entire financial support. This is accompanied by

measures for the improvement of production organization, and for a more rational employment of labor. At the same time attention is paid to finding alternative employment for those workers who leave agricultural production as a result of this merger. Reorganization of the agricultural structure in the CMEA countries affects all enterprises and effectively achieves amalgamation on a national scale.

A basic form of agricultural production organization on a centrally planned basis has been carried out through the application of Lenin's cooperative plan and the experience of the USSR.

This involves:

- The amalgamation of smallholdings to form large cooperative farms, after agreement has been reached with the smallholders;

- Economic liquidation of large feudal and capitalist forms of agricultural production, confiscation in the form of obligatory selling, nationalization, etc., and the delivery of farm equipment to the newly created state or cooperative enterprises;

- Total financial, material, technological, organizational, etc. support by the state for the construction and consolidation of the newly created collective agricultural enterprises;

- Training of the necessary number of engineers, mechanics, drivers, agronomists, livestock specialists, land economists, and other personnel capable of managing the complex and expanding activity of these enterprises.

- Based on these fundamental and uniform principles, the Community countries' agrarian policy during the entire period following the Second World War, and especially during the investigated period, show subtle variations in their application, because of their individual economic, political and other conditions. At the same time each country supplements and enriches the practice and the experience of the collective system, thereby contributing to its economic improvement and development.

Thus in spite of a lot of common principles and approaches, each individual policy is distinguished by its own characteristic features. These variations concern:

- The forms, methods and rates of the collectivization process;

- The scale of enterprise and production amalgamation;

- The level of its concentration and specialization;

- The methods of management and policy of incentives.

The number of enterprises (state and cooperative) in each country varies considerably from year to year, but this does not influence the volume of production and productive means in the socialist sector, because it is a result of the planned policy of amalgamation of production by transition of enterprises of one type to enterprises of another. The changes are often dictated by:

- The needs of national or micro-regional production distribution;
- Production concentration and specialization in the individual countries and micro-regions;
- The policy for a more rapid increase in agricultural production efficacy.

In all cases this change does not concern the type of new ownership, and cannot change the proportion between socialist ownership and private ownership.

Towards the end of the investigated period the proportion of cooperative and state enterprises in the individual countries' agricultural economy was very high, with the exception of Poland, where at the end of the 1950s a great number of cooperative farms broke up, but over the past few years state and cooperative enterprises have strengthened their position.

The growing importance of the socialist sector in the Community countries has considerably influenced their national economic structure. The main economic results, tendencies and rates of agricultural development correspond to those of other branches of the national economy. Poland is again an exception due to the disbanding of the above-mentioned cooperative enterprises. (See Table 14).

The USSR socialist sector formed 100% of the national income in 1975. Bulgaria followed with 99.9%, the CSSR with 99.5%, and Hungary with 98.3%. This percentage was also high in the GDR - 95.8% and in Romania - 90.64%. The share of the socialist sector in the gross agricultural production structure in every country was higher than 95%, with the exception of Poland, where it formed only 20% of the national income. The increase in arable land held by socialist enterprises in this country has also contributed to the steadily increasing percentage of national income from the national socialist sector as a whole.

The process of socialization during the entire 15-year period shows an increase in all countries, but it is most rapid in the countries where collectivization of agriculture was at a lower level at the beginning of the period, i.e. in Romania, Hungary, the GDR, and Poland.

The degree of collectivization of the most important means of agricultural production - the cultivated agricultural areas -

Table 14

Share of the Socialist Sector in the National Economy (% of total)

Country	Year	National Income	Gross Agricultural Production	Agricultural Area
Bulgaria	1960	99.5	99.2	98.9
	1965	99.7	99.7	99.5
	1970	99.7	99.8	99.6
	1975	99.9	99.9	99.8
Hungary	1960	91.0	76.8	77.8
	1965	97.0	96.7	97.1
	1970	98.1	96.8	97.1
	1975	98.3	96.8	97.2
GDR	1960	34.9	86.8	92.5
	1965	86.0	89.8	93.9
	1970	85.5	91.7	94.2
	1975	95.8	94.8	94.6
Poland	1960	67.5	11.2	13.1
	1965	73.4	12.9	15.2
	1970	79.2	14.9	16.6
	1975	86.1	20.0	21.0
Romania	1960	83.3	64.3	81.9
	1965	96.3	91.0	91.4
	1970	96.2	90.2	90.8
	1975	...	...	96.0
USSR	1960	99.99	99.9	100.0
	1965	99.99	99.95	100.0
	1970	100.00	100.0	100.0
	1975	100.00	100.0	100.0
CSSR	1960	98.5	90.5	88.0
	1965	99.2	94.6	90.0
	1970	99.2	95.1	90.0
	1975	99.5	96.4	94.2

Source:

Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М.,1976, табл. 13

had a decisive influence on the volume and percentage of national income created in the socialist sector of agriculture. The extent of socialization of agricultural areas rose: this resulted in an increase in gross agricultural production and national income. However, because of rapid industrialization in all countries, the proportion of national income created in the agricultural sector increased more slowly than the total national increase.

The proportion of state and cooperative enterprises in each of the countries' agricultural branches underwent definite changes during the investigated period. In spite of this, the land area included in cooperative enterprises exceeded that of the state agricultural enterprises. This was the case especially at the beginning of the early 1960s in Hungary, the GDR, Romania, the CSSR, and Bulgaria until the creation of agro-industrial complexes. One exception was again Poland, where land consolidated in state farms considerably exceeded that of cooperative farms.

In the USSR a process of state ownership of agricultural production was carried out. This has resulted in proportionate changes in the land included in cooperative and state farms. In 1960 cooperative farms consisted of 87.17% and state farms 12.83% of the total arable land area. In 1975 this proportion had changed to 34.68% and 65.42%. This indicates that during the last few years the state farms have played a crucial role in Soviet agriculture.

The main economic trends characterizing the individual countries' agricultural production during the 15-year period are as follows:

Bulgaria [1, 22, 51, 54]

The collectivization of agriculture and the construction of state agricultural farms in Bulgaria was completed as early as the end of the 1950s. As a result of this, approximately 3,200 cooperative farms were built. In 1958-1959, the first amalgamation of cooperative agricultural farms (CAF) was carried out, resulting in a reduction of these enterprises to about 1000.

CAF has incorporated all the production means - land, livestock, machines and farm equipment - possessed by the private owners who joined together, and it has carried out all production processes jointly, utilizing the cooperative farmers and their families as manpower. The financial maintenance of the whole production activity has been taken over by the cooperative.

The new economic and social policy sanctioned and followed after April 1956 has played a significant role in Bulgaria's agricultural development. This policy has:

- established a new more rational condition for the interaction between state industry and state and cooperative farms;

- extended the principle of cooperative democracy by organizing the agricultural production process on a collective basis;

- accepted financial incentives as one of the most important elements in successful production management;

- and discovered greater possibilities for the further development of the agricultural sector as an essential and integral part of the national economy.

In April 1961, a decision was formulated at government level on the most rational means of using the available natural and economic conditions. This involved:

- A division of main agricultural crops and livestock into districts;

- A gradual amalgamation of livestock farms and of plant-growing branches;

- An improvement in the skills of manpower employed in agriculture.

Production intensification became a main feature of further agricultural development. Because the improved farming methods introduced in the early 1960s rely heavily on an adequate water supply, Bulgaria's agrarian policy has allocated great financial, material and labor resources in order to rapidly extend the irrigated areas. Reservoirs and wide irrigation networks were built especially in regions where there was intensive cultivation of vegetables, fruits and industrial crops.

Considerable attention was paid to the further mechanization of the production processes. Structural changes in land use have been affected by increasing the share of labor-intensive crops.

The training standards of manpower engaged in agriculture were raised at all levels. Particular attention was paid to the technical training of personnel using the agricultural machinery.

The development of new high-yield varieties of basic crops, e.g. wheat, tomatoes, grapes, etc. were introduced into Bulgarian agriculture in the second half of the 1960s. Breed structure improvement also continues.

The utilization of chemicals in agriculture has become much more important in policy and in practice. This is affirmed by the intensified construction of new chemical plants, and an increase in the use of chemical fertilizers and preparations. The agrarian policy gave priority to the question of how to accelerate the introduction of new technology and methods in agriculture. Towards the end of the 1960s this economic policy paid attention to production concentration and specialization in all branches of the national economy and particularly in agriculture.

In agricultural production this task is modified to create the real material, technical and organizational conditions for the transition of the whole production activity to an industrial base.

Further production concentration must:

- seek new opportunities for the intensification of specialization on the individual farms;

- contribute to binding large-scale agriculture with large-scale food industry production;

- accelerate the introduction of modern industrial technology and methods of production and management in the basic agricultural sub-branches.

All these goals were achieved in the early 1970s, when large-scale, economically powerful agricultural enterprises, having a very high degree of concentration and specialization achieved by horizontal integration, were established. This new form of organization is known as the "Agro-industrial complex".

At the same time, a policy of greater vertical integration was also carried out. Through the unification of the existing agricultural and industrial enterprises, the Industrial agrarian complex - IAC - has been created.

In some cases production integration has incorporated organizations dealing in applied research in the specialized fields of the IAC and AIC. Thus the Production Research Trust (PRT) was founded. State and cooperative farms have been unified under these three new forms of agricultural organization.

Their main economic task is to make considerable economies of scale through increased production and the creation of optimal conditions for application of industrial methods in agriculture and the food industry.

On the other hand by amalgamating the employees of the state and cooperative enterprises, the IAC and AIC have influenced the solution of many social questions, such as the equalizing of labour conditions for workers from different sectors of the national economy.

In his report in the April Plenary Session, (1970), of ZK of BKP T. Zivkov explained not only the basic priciples behind these forms but formulated ways to establish them in practice by:

- A voluntary joining of the individual agricultural enterprises to the AIC or IAC;

- A detailed assessment of the content, size, and production specialization of the complexes;

- The retension of the independence and organizational form CAF and SAF at the first stage of construction of AIC, IAC, and PRT;

- Territorial unity of the complex and democracy in its management.

Sanctioning these new forms of enterprise, the Plenary Session stressed that they should not be looked upon as static, but as organizations developing over time. The Session also warned that, while accomplishing a high degree of concentration and specialization, agricultural production should in no way be reduced, e.g. small livestock farms should only be liquidated after the new agro-industrial complexes have been put into operation.

During the last five-year period (1971-1975), Bulgaria's agrarian policy has paid greater attention to:

- The further industrialization of agricultural production;

- The maximum utilization of scientific and technical achievements;

- And an increase in labor productivity throughout the entire agricultural sector.

The problems of mechanization and chemicalization in agriculture and the organizational, ecological, social, and economic questions connected to them, have been given priority. Great attention has been paid to the creation of national highly productive and high-quality agricultural crops; similar foreign crops are also used. Considerable efforts have been made for the solution of one of the basic problems of animal husbandry - the fodder supply.

In the sphere of irrigation most attention has been paid to the modernization of existing systems and the construction of new ones, adapted to the requirements of modern farming and giving the possibility for full utilization of manpower.

The role of personnel in the production process is crucial, especially in the introduction of modern industrial technology and techniques. Therefore, the principle goal has concerned the improvement of labor skill. Machine operators have become major figures in agricultural production.

During the last five-year period, the number of AIC, and IAC, increased from 161 in 1971 to 164 in 1975, but the number state and cooperative enterprises, included in the AIC and IAC, decreased correspondingly from 158 to 91, 662 to 281. This has been caused primarily by the organizational changes that took place in the structure of the newly established AIC, IAC and PRT. (See Table 15)

Table 15

Basic Features Characterizing Agro-Industrial Complexes development*
in Bulgaria

	1971	1972	1973	1975
Number of Agro-Industrial Complexes	161	170	167	164
Number of Holdings - members of Agro-Industrial Complexes:				
- State farms	158	156	144	91
- Agricultural production cooperatives	662	679	535	281
Number of specialized enterprises in Agro-Industrial Complexes:	99	154	265	703
Indices of gross agricultural production (1970 = 100)*	100	108	108	112
Indices of gross crop production (1970 = 100)*	100	111	111	110
Indices of gross livestock production (1971 = 100)*	100	103	104	116
Sown areas including planting in orchards between trees - th. ha.	3156	3179	3166	3204
Number of people employed - thousand	1064	1128	1087	985
Tractor horsepower, at the year's end - thousand	1174	1301	1460	1607
Number of grain combine harvesters (units) at year's end	8309	8686	8729	8884
Livestock (at the year's end),thousand:				
- Horned cattle, including buffaloes	1036	1100	1132	1256
- of which, female buffaloes and cows	411	423	428	456
- Pigs	1660	1705	1556	1932
- Sheep	5635	5690	5714	5800
- Horses	103	93	87.6	73.9
- Poultry (numbers in millions)	12.7	14.5	15.7	20.9

* At comparative prices for 1971.

Source:

Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 78

At the same time the number of specialized enterprises increased in the framework of the AIC, IAC and PRT from 99 in 1971 to 703 in 1975. Towards the end of the last five-year period, the state and cooperative farms have lost their independence and have been completely absorbed by the AIC, IAC and PRT.

The AIC, IAC and PRT gross agricultural production in 1975 increased by 12% in comparison with 1971[1]. The climatic conditions in 1973 and especially in 1974, however, were unfavorable for most plant-growing crops. Hence gross plant growers production in the last few years remained almost unchanged. Only animal husbandry production maintained a steady growth.

The sown areas during this period remained more or less the same, consisting primarily of cereals and pulse crops which covered about 2/3 of them. The second largest group - fodder crops - covered about 1/5, and industrial crops, which covered about 1/6, increased approximately 10% in comparison with 1971.

During the last few years perennial planting areas were cultivated over a considerable area - 300 thousand hectares; of which vineyards over 108 thousand hectares; and fruit over 89 thousand hectares. Generally, however, the areas of perennial plantings remained at the 1971 level.

Most of the factors influencing the agricultural production level during this period have also changed considerably, e.g. the number of people employed in agriculture decreased 7.25%. At the same time technical equipment for production grew immensely. Tractor power in the AIC increased 36.88%, and the number of grain combine harvesters - 6.29%.

Horned cattle including cows show a line of constant growth. Other livestock - pigs, sheep, poultry - have also increased. On the other hand, the number of horses, used mainly as draught animals and gradually replaced by mechanization, have decreased steadily.

Gross production of the main agricultural crops and livestock in Bulgaria has increased almost continuously. During 1975, however, when the climatic conditions for some crops were unfavorable, their gross production decreased particularly for sunflowers, potatoes, vegetables, and grapes.

In general modern technical equipment and plant-growing and animal husbandry technology have resulted in the maintenance of a high production level of cereals, and pulse crops, and several varieties of fruit.

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[1] Data is only available for the period 1971-1975, because these new forms of enterprise were not introduced until 1970.

At the same time, increases in the general production of meat and fat (in slaughtered weight) were evident: from 294 thousand tons to 324 thousand tons; milk production (in 3.5% butterfat equivalent) also showed an increase from 1,497 thousand tons to 1,624 thousand tons, and eggs from 757 million to 956 million, respectively.

Hungary [8, 30, 51, 55, 81]

The collectivization of Hungarian agriculture on a socialist basis was completed between 1959 and 1962. In this comparatively short period of time most of the country's arable land, agricultural technology, draught and productive livestock, as well as manpower were brought together in large-scale socialist state and cooperative enterprises.

Therefore, the beginning of the investigated period in Hungary was characterized by the dominance of socialist agricultural enterprises and by the integration of the production organization and process.

The aim of collectivization,and of the further concentration which followed,was to increase production and make economies of scale. The national agrarian policy wanted to use the opportunities for production specialization within the internal framework of the enterprise, through binding agricultural to food industry development.

The integration of agriculture with food industry development, which aims at completing the whole production cycle and supplying consumers with finished products, is one of the most characteristic features of modern economic development in this country.

The reasons for this approach lie in:

- the system of economic planning which demands proportional development between these two closed inter-related branches;
- and the fact that food processing in Hungary can rely almost entirely on national raw materials.

Two basic and mutually complementary tendencies were displayed in the solution to the problems of Hungarian agriculture towards the end of the 1960s:

- the connecting of agricultural production in various forms to the food industry and to the trade in foodstuffs, thus aiming to create a modern agricultural economy;
- the linking of the agricultural economy to food processing industry production in order to establish the national agro-industrial complex.

The cooperation between agriculture and industry during the 15-year period was aimed at utilizing the production potential of agriculture, industrial and commercial enterprises, eliminating the need for the creation of separate storage and other facilities. This cooperation was also directed at stabilizing the agricultural and related industrial, and commercial enterprises on a long-term basis of permanent and mutual benefit. The process of vertical integration acquired a much greater importance after 1970.

The form of cooperation and vertical integration between agriculture and industry, used in Hungary, did not differ from that used in the other socialist countries. The most elementary form is when the production and manufacture of raw materials are carried out by separate enterprises, which have long-term agreements for production cooperation. A higher form is when the agricultural enterprise makes industrial manufacturing a part of its own activities.

Another form of this integration is when several agricultural enterprises jointly establish food-processing factories, which they supply with their own raw materials.

Because of the considerable differences in production conditions and because of the aim of integration and cooperation, the methods and forms of collaboration between agriculture and industry are diverse and flexible.

Food processing enterprises initiate the process of vertical integration by:

- establishing their own farms to supply their raw materials;
- and making long-term contracts to buy agricultural produce from individual farms.

In this form the food processing industry can supply its partners with certain machinery, sowing materials, forage, etc. The agricultural enterprises can organize some processes, like grading, packaging, storage, etc., which are required by the food processing industry. The commercial enterprises also participate in the common process of vertical integration. They regularly supply the producers (agricultural and manufacturing enterprises) with accurate information about the fluctuations of national and international demand in fresh and processed foodstuffs.

At the same time the agricultural enterprises have the opportunity to market their produce direct to the population.

The highest form of vertical integration is the establishment of common enterprises combining the agricultural, food processing and commercial activities. These enterprises carry out a complete production cycle in the food and agricultural branch, i.e:

- the supply of sowing and breeding materials, machinery, and fertilizers;
- the production of raw materials for the food processing industry;
- the manufacture of these raw materials;
- and the marketing of the finished products, etc.

At the end of the 1960s Hungary incorporated some additional elements into its agrarian policy. The essence of these additions consisted of eliminating some previous mistakes made in agricultural production development. The main aim was to ensure a more adequate increase of agricultural produce for the growing needs of the population and the food processing industry as well as for export.

The basic goals of the new agrarian policy were:

- to create greater agricultural production;
- to improve the efficiency of the agricultural enterprises;
- to raise the living standards of agricultural workers to the level of those of industrial workers.

In order to achieve these goals, several economic measures had to be taken:

- amelioration of material and technical conditions for the development of agriculture;
- the acceleration of the implementation of scientific and technological advances;
- more favorable credit conditions for the agricultural activities;
- the improvement of labor skills by further training;
- and the perfecting of the economic management of the individual enterprises and in the agricultural branch as a whole.

The principle task of Hungarian agriculture in the five-year period 1966-1970 has been to raise production by 13-15%. In crop-growing, the aim has been to achieve more rapid and steady rates of growth, to maintain the high level bread-grain production and to increase the crude fodder production.

Because of the limited possibilities for extending the arable areas and changing the crop structure, the agrarian policy has given priority to the increase in yields per hectare; this applies particularly to corn-growing. However in some sub-branches, such as that of vegetables, production expansion together with

increases in yields have been sought by extending cultivation areas; in others such as fruit and vine growing, more attention has been paid to production amalgamation.

This policy has stressed the development of animal husbandry. As well as tackling the tasks of increasing the numbers and productivity of the stock, serious attempts have been made to improve the structure and increase efficiency in this complex sector. In cattle-farming, the aim has been to improve the genetic breed structure by increasing the proportion of animals bred for meat, or by creating a new breed variety, which may be used effectively both for meat and milk, but especially for high-quality meat production.

Because of the aim to raise the general productivity of livestock, considerable attention has been paid to the modernization of building and farm equipment used for livestock farming. It is well known that in the last few years technical progress has advanced very rapidly, and the present technology will soon be obsolete. This was taken into account when capital investment was made in animal husbandry. A further improvement in production conditions of livestock, however, has taken place in this area, but it has avoided dependence on expensive equipment.

In order to produce sufficient fodder to cover the requirements of livestock, increased quantities of fertilizers have been applied to fodder crop areas. During the last decade (1966-1975) agricultural enterprises in Hungary developed the scale of production concentration and amalgamation. Therefore, the number of state and cooperative farms of all types decreased, but the average indicators for private enterprises rose. (See Table 16)

Agricultural enterprises gross production estimated on the basis of 1960, rose in 1975 by 88% in state farms and 253% in cooperative farms.

The livestock production development in cooperative agricultural enterprises far surpassed plant-growing production development during the entire 15-year period. Towards the end of 1975, this gross livestock production increased 3.8 times (in comparison with 1960), and plant-growing only 2.2 times. Livestock production growth in state farms has also exceeded plant-growing production growth during the last few years.

The sown areas of state farms remained fairly stable with slight symptoms of decrease, while the sown areas of cooperative enterprises increased by 250 thousand hectares.

The number of tractors on state farms has decreased approximately 20% during the 1965-1975 period; on cooperative enterprises it remained at about the same level. The total rate of horsepower of tractor engines rose in both sectors - 42.71% in the cooperative sector and 16.28% in the state sector. Grain combine harvesters increased 71.26% in the cooperative sector, while state farms showed only a slight decrease, especially at the end of the period.

Table 16

Basic Features Characterizing State and Cooperative Farms in Hungary

	State farms			Cooperative farms		
	1965	1970	1975	1965	1970	1975
Number of production farms (at year's end)	214	180	147	3750	2805	1834
Indices of total gross production (1960 = 100)	122	152	188	159	183	253
Indices of gross production of crops (1960 = 100)	116	141	183	141	146	216
Indices of gross livestock production (1960 = 100)	129	167	195	222	315	382
Sown area, including plantings in orchards between fruit trees th. ha.	632	602	606	3257	3209	3511
Number of tractors (units, at year's end)	11667	12050	9300	50065	54124	48500
Total rated horsepower of tractor engines, thousand h.p.	473	586	550	1892	2377	2700
Number of grain combine harvesters (units, at year's end)	1523	1855	1500	7299	9839	12500
Number of lorries, including specialized and utility trucks (pick-ups) at year's end	1686	2496	3600	4334	10958	14500
Livestock (at year's end), thousands:						
- horned cattle, including buffaloes	245	225	251	827	950	1079
- of which, cows and female buffaloes	98	91.3	102	283	322	382
- pigs	788	978	1254	1756	1704	1931
- sheep	683	418	355	1409	1525	1481
- horses	23	13.6	8.4	169	116	67.6
- goats	—	—	—	—	0.2	—

Source:

Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 79 и 80

Definite specialization amongst two basic types of agricultural enterprises - state and cooperative - was observed in the livestock branch. Pig-farming prevailed in state farms utilizing mainly industrial methods of production and cattle - and sheep-farming was dominant in cooperative farms. The increase in cattle head in the cooperative sector was considerably more rapid than that in the state sector. In 1975, the number of cattle in cooperative enterprises was 30.47% higher than in 1965, while the corresponding number in state enterprises remained at almost the same level.

There is an opposite tendency in pig-farming. The data indicate that greater attention was given to the development in the state sector. Although the number of pigs in the cooperative enterprises has increased 9.96%, their numbers on state farms has been expanded by 59.14%.

The policy carried out on state sheep farms is clearly illustrated by the decrease of 48.02% in the last decade. On cooperative farms, in spite of fluctuations in specific years, the numbers increased marginally towards the end of the period.

The volume and rate of growth in gross production of the main plant-growing and livestock products in this country show steady increases. This was especially true for cereals and pulse crops, which increased 87.53% in the cooperative sector and 58.93% in the state sector.

In the cooperative sector the quantity of milk (3.5% butterfat equivalent) increased 57.42% during this period, as did the number of hen eggs - 4.2 times. On state farms there was also a 7.64% increase in milk quantities and egg quantities almost tripled.

In spite of the more rapid development on cooperative farms, the results on state farms as measured by crop yields and main crop and livestock productivity were considerably higher. This can be attributed to better technical equipment and improved economic management.

The German Democratic Republic [3, 20, 46, 65]

A characteristic element in the GDR's agrarian policy during the investigated period and also during the period after the Second World War, was the presence of several forms of cooperation in agriculture. Together with the establishment of state farms, which in character do not differ from SAF (state agricultural farms) in the other European central planning countries, the GDR's agriculture was amalgamated through the creation of 3 types of cooperative farms.

The cooperatives of the first type retained their private ownership of land and other production means, but all processes in plant-growing were carried out by the the united efforts and

resources of the cooperative members. This type of enterprise played a relatively small role in the general agricultural structure.

In the second type of cooperative farm, the arable land, livestock and farm equipment were pooled, on the condition that in a given period (10 years) the cooperative farms would pay their members the proportionate cost of their contribution to the enterprise. The distribution of the gross annual income depended upon the job specification and degree of participation in the production process of each member (cooperative farmers) and on the proportion of land invested. This form played the smallest role.

The third type of cooperative comprised land, and all production means owned by the members before entering the cooperative; but they received no compensation for their contribution. The distribution of income depended on the job specification and participation of the members and families during the whole year.

This third type during the 15-year period was a basic form of socialist agriculture, and together with SAF played a decisive role in solving the problems of agricultural production in this country.

Towards the beginning of the investigated period, (1961-1965) the GDR completed the main part of the organizational reconstruction of its agriculture on a centrally planned basis, and set some important economic goals for the newly created enterprises[2].

The most important task was to achieve a definite degree of self-sufficiency in agricultural and food commodities, and especially in those agricultural products for which the countries' soil and climatic conditions were favorable: bread-grain and fodder-grain, potatoes and animal products. Being one of the most densely populated European countries and disposing of 0.37 ha per capita for the nutrition of its population, the GDR in its agrarian policy gave priority to the most rational and effective utilization of land.

A primary element of national agrarian policy towards the end of the 1960s was the increase in capital investment for land reclamation, agricultural production, chemicalization and mechanization. Considerable state investment was made during the five-year period 1966-1970 for drainage irrigation schemes and irrigation technology. Moreover, considerable concessions for low interest credit were introduced and widely applied in order to stimulate investment in the agricultural enterprises. Credit was allocated proportionate to the amount of capital raised by the enterprise itself, and the period over which the investment was recovered, e.g. the greater the amount raised by the enterprise, and the shorter the recovery period, the greater would be the state credit.

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[2] In the spring of 1960 almost all private farmers took part in one or another form of agricultural cooperative enterprise.

During the last five-year period, the network of agro-chemical centers for servicing agricultural production was completed. The productivity of labor achieved in these activities was 4 times greater than that realized by the individual agricultural enterprises. The agro-chemical centers were directly subordinated to the district authorities and were serviced by district centers for agricultural technology. These centers played a greater role in the maintenance, repair, spare parts supply, etc. of agricultural technology in the socialist enterprises.

A strategic task in the agricultural development during the last three five-year plans was to equalize the conditions in agricultural and industry to a greater extent.

The solution of this problem has been sought through the replacement of manual labor by mechanization - in the cultivation of the main agricultual crops and in animal husbandry. Partial automation has been effected for some of the most labor-consuming processes and operations. The development of agricultural machine-building has been an essential prerequisite for the solution of the above problem.

A primary role has been assigned to the mechanization of potato, sugarbeet and horned cattle production and also to the mechanization of the packaging and food industry. The agricultural transport network is included in the general process of mechanization. This system enables the products related to agricultural production (fertilizers, chemicals, spare parts, fodder, etc.) to be transported by the supplier to the enterprise, sometimes even directly to the fields where they are needed. Also the transportation of plant and animal production for industrial processing or for the domestic or international market is carried out by the commercial organizations. The transportation of other agricultural produce is carried out by the enterprises servicing agriculture. Because of this the state and cooperative farms do not need their own transport technology.

The further increase in grain production occupies an important place in the GDR's agrarian policy, which foresees bread as a primary constituent in man's diet in the future. Besides grain foods, cereals used as animal fodder open up great opportunities for combination with synthetic amino acids. This increases their nutritional value, and consequently animal productivity. At the same time the success in the fields of genetics, selection and agro-technology open up considerable opportunities for increasing the average yield of all wheat crops.

At present cereal crops occupy approximately 36% of the total agricultural area and almost 50% of the GDR's plowland. On average they cover 50-54% of the daily calorific intake of the population. Although more recently consumption of easily digestible proteins in man's diet has increased, consumption of grain products has not decreased significantly, and is now

showing a tendency towards stabilization. But the greatest proportion of grain foods produced in this country is required for livestock farming. Therefore, particular attention has been given to the production and maximum usage of combined fodders in livestock farming, which has resulted in a decrease in the need for concentrated fodder by 10-15%.

Efforts have been made to construct modern storage equipment, in order to create optimal conditions for the preservation of the grain. During the last five-year plan under the existing system of inter-cooperative links and through the specialized servicing enterprise, the task of preparing the final product for the consumer was executed by special grain works.

These grain works have their own silos (the aluminium ones with a capacity of 100-120 tons are considered to be one of the most suitable) as well as their own factories for fodder mixing and milling. Therefore, they have a considerable influence on the development of grain production.

The construction of the grain preservation and milling works is one of the forms in which the policy for the establishment of inter-cooperation units is displayed. It is expected that this form will create more favorable organizational conditions for the further intensification of agricultural production and for a more rational utilization of material, technical, and financial means for each cooperative enterprise.

Together with the material, technical and organizational measures, contemporary agrarian policy makes use of the market and financial mechanism. In this respect there has been an increase in the purchase of some basic agricultural products and an additional stimulation for better quality production carried out at the end of the 1960s. The aim of these improvements has been to stimulate the production of animal products, especially beef, mutton, pork, milk for processing purposes and direct consumption, and skimmed milk for livestock nutrition.

An additional payment was introduced for potatoes supplies from classes 1A and 1B, from the specialized cooperative farms. Higher prices and payments for the specialized enterprises have been introduced for sugarbeet. Higher prices have also been introduced for surplus production in bread crops, oil-bearing seeds, potatoes, livestock for slaughter, wool and some other products.

This policy had a decisive influence on agriculture development, particularly on individual farms. During the last five-year period (1971-1975),the GDR was self-sufficient in the principal food products, excluding sugar, fruit, vegetables and some grain for bread products. The number of state and cooperative enterprises in the GDR has decreased over the last few years, mainly because of enterprise amalgamation and land concentration, especially during 1965-1970. (See Table 17)

Table 17

Basic Features Characterizing State and Cooperative Production Farms*

in the GDR

	1965	1970	1975
Number of agricultural enterprises (at year's end)	16424	10679	7199
Indices of gross production (1960 = 100)	116	125	147
Indices of gross crop production (1960 = 100)	99	102	107
Indices of gross livestock production (1960 = 100)	135	151	192
Sown areas including plantings in orchards between trees, thousand ha	4470	4409	4540
Number of tractors (at year's end) thousands	124	149	140
Total rated horsepower of tractor engines, thousand h.p.	4337	6440	7585
Number of grain combine harvesters,(units, at year's end)	15409	17911	11235
Number of lorries, including specialized and utility trucks (pick-ups), (units, at year's end)	13115	27186	42518
Livestock (at year's end), thousands:**			
- horned cattle, including buffaloes	3114	4279	5484
- of which, cows and female buffaloes	1281	1712	2145
- pigs	5689	7642	11206
- sheep	1388	1307	1740
- horses	111	53.3	52.2
- goats	1.8	0.7	31.2

* All farms - state and cooperative.

** In 1975 including livestock in private holdings of individual members of agricultural productive cooperatives.

Source:

Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 79

In comparison with 1960, gross agricultural production in state and cooperative enterprises increased 47%, the main contribution came from livestock farming which rose by 92%.

Technical equipment in both sectors increased from 1961 to 1975 as a result of the rise in the number of tractors - 12.90% - and also the critical increase in the horsepower of tractor engines - 74.89%. The number of combines decreased considerably during this period - 27.11%. This is due to the fact that during the last few years the GDR developed highly-productive combines - the E 542 - which have a much greater capacity than former models.

During the entire period, state and cooperative enterprises followed a consistent policy towards accelerated development of livestock farming. The number of cattle between 1966 and 1975 increased overall - 76.1% and the number of cows - 57.44%. Pig-farming developed even more rapidly - 96.98%. The number of sheep also showed an absolute increase, although not so rapid. During the last five year period the number of goats decreased considerably, as did horses used as draught animals as a result of the policy of production intensification and technical improvement in equipment.

The growth in livestock production was excellent. The quantity of meat and fat (in slaughtered weight) increased 2.5 times. Milk quantities (in 3.5 butterfat equivalent) increased 2.3 times. The number of hen eggs increased over 3.7 times. Gross production of cereal and pulse crops increased on all socialist farms - 33%.

The higher yields of principal agricultural crops and the greater productivity of livestock have made significant contributions to production increases in agricultural enterprises over the last decade.

Poland [6, 15, 36, 51]

Agricultural development in Poland has been characterized by several differences in comparison with the other European centrally planned economies.

Like the other countries, Poland has integrated its agricultural development with the general development of its economy, and has attempted to meet the rising needs for agricultural products of industry and the population.

First of all the agrarian policy of this country placed an emphasis on the development of state and cooperative forms of agricultural production. Like the other Community countries, Poland aimed at developing intensification in its agriculture by increasing agricultural production and improving its economic efficiency.

But unlike the other European CMEA countries, Poland, since 1957, has retained a considerable number of private farms, only gradually achieving agricultural reconstruction on a state and cooperative basis.

By the early 1960s small private farms were playing a decisive role in agriculture development. State farms had the task of organizing the production of high-quality seeding and planting material and breeding stock for the rest of the co-operative and private producers. In addition, by experimentation the state farms have devised the most appropriate organizational and technological methods of large-scale management under existing conditions.

Cooperative farms in this period numbered about 1100, and their role in the total agricultural economy was limited. The small farms played the largest role in this branch, but their production volume rate fell behind that of the economy as a whole.

This situtation influenced the special program for further state and cooperative agricultural development in Poland. Towards the end of the 1960s the process of land collectivization was hastened by a law for compulsory purchase of land by the state. The object of this law was to create an opportunity for nationalizing private farms, which had fallen behind technologically and were incapable of realizing sufficient production. The role of "agricultural groups"[3], which towards the end of the 1960s accounted for 90% of the villages and about 50% of the farmers, became greater. They joined together to buy machinery for their agricultural activites. State centers for mechanization also became more important. As a result of these measures, the possibilities for a planned regulation of agriculture and its integration into the whole economy were improved.

In the period 1971-1975 the most important task of Polish agriculture was to achieve self-sufficiency in cereals, by securing considerable quantities of concentrated fodder for the development of animal husbandry. The expansion of potato production and some industrial crops was also stressed.

The solution to these questions was found through the further intensification of agricultural production. For this purpose, the supply of tractors (especially heavy-freight ones) with 75 horsepower engines and light ones with 30 horsepower engines had to rise. Production of tractor-driven machines, and especially machines for harvesting the grain and fodder crops, also had to be increased.

During this period, the Polish chemical industry augmented the production and supply of fertilizers and pesticides, by expanding the works in Pulgava and Vrotslav, intensifying the

[3] "Agricultural groups" in Poland are a group of private farmers using some cooperative forms of labor and production organization.

work in Tarkov and Ketzanik (for production of nitrogenous fertilizers) completing and operating the phosphorous fertilizer works in Gdansk and Polici. Agricultural production intensification encouraged a more rational utilization of the available land. An increase in capital investment for mechanization, land improvement, building, and the supply of other agricultural production means formed an integral part of the agrarian policy from 1971 to 1975.

The agrarian policy has attempted to increase the role of state and cooperative farms and agricultural groups.

The state farms have directed their activities mainly towards the production of grain, dry fodder and potatoes, beef and milk. They have continued to produce highly specialized varieties of seeds and animals, and in this way to satisfy the needs of all agricultural enterprises (private and state). At the same time the state farms have had to maintain production concentration, specialization, and links with processing and commercial enterprises.

In order to fully utilize the available agricultural production, the food industry has had to increase capital investment to enlarge its production capacity. Refrigeration, and especially refrigerated transport has improved preservation of agricultural production and fish catches. During this period links between the food processing industry and its raw material suppliers became closer. The food industry integrated and coordinated the process of specialization, concentration and raw material production. At the same time, it improved techniques and conducted experiments for the better utilization of raw materials and for the improvement in the quality of the final product.

The direction of the changes in Polish agriculture has been consistent: towards an increase in the percentage share of the state sector of the economy. As a result of the continuing production concentration the number of state farms and of all types of cooperative enterprise decreased during the period 1966-1975. (See table 18)

The socialized area however was increased. The sown areas in state farms rose from 1,865 thousand hectares in 1965 to 2,244 thousand hectares in 1975, and in the cooperative enterprises from 156 thousand hectares to 237 thousand hectares. 750,000 hectares of private farmland were incorporated into the state and cooperative enterprises. At the same time cooperative and state farms were given about 800 thousand hectares by the state land fund.

Towards the end of the last five-year period, the state and cooperative farms controlled an extra 20% of the country's agricultural areas, and secured 33% of total production of cereals, and 27% of the livestock production.

Table 18

Basic Features Characterizing State and Cooperative Farms in Poland

	State Farms			Cooperative Farms		
	1965	1970	1975	1965	1970	1975
Number of agricultural enterprises (at year's end)	6515	5374	3660	1251	1096	1216
Indices of gross production (1960 = 100)	136	178	272	99.7**	132**	268**
Indices of gross crop production (1960 = 100)	131	169	230	99.9**	123**	183**
Indices of gross livestock production (1960 = 100)	149	198	361	99.3**	142**	399**
Sown areas including plantings in orchards between trees, thousand ha.	1865	2002	2244	156	181	237
Number of tractors (at year's end)	49001*	64863	78863	3801*	5859	10312
Total rated horsepower of tractor engines, thousand h.p.	1681*	2416	4271	119*	213	453
Number of grain combine harvesters (units, at year's end)	4919	10780	8368	145	818	1666
Number of lorries, including specialized and utility trucks (pick-ups), (at year's end)	2912	3477	5584	399	1097	2762
Livestock, (at year's end) thousands:						
- cattle, including buffaloes	1180	1565	2291	62.4	112	236
- of which, cows and female buffaloes	452	529	579	25.7	34.7	47.4
- pigs	669	828	2159	48.0	53.8	321
- sheep	399	460	680	18.5	26.4	78.8
- horses	93.4	62.2	36.4	7.6	6.3	3.1

* Excluding garden tractors
** Including production on private farms
Source:

Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 79 и 80

State and cooperative enterprises' gross production in 1975 was 2.7 times greater than in 1960. In the last three five-year periods livestock development was the most rapid in both sectors - 3.6 times greater than in 1960. This production was 2.3 times greater in plant-growing.

In cooperative enterprises, livestock production has increased four times in the same period (including the growth of the personal livestock of cooperative members). At the same time the cooperatives' plant production has increased 1.8 times.

The characteristic feature in the development of state and cooperative farms' gross production, including the gross production of the two basic sub-branches (plant-growing and livestock farming) is the consistent trend towards growth.

Three factors have contributed to this growth:

- The rising proportion held by the socialist sector by an extension of land and livestock;

- The growth of agricultural technical equipment, and

- The increase in average yields and productivity.

The number of tractors has increased 60.94% in the state sector during the period 1966-1975, and in the cooperative sector, 2.7 times. The total rated horsepower of tractor-engines has increased 2.5 times in state farms, and 3.8 times in cooperative farms. The number of combines also grows rapidly - 1.7 times in the state and 11.5 times in the cooperative sector.

State and cooperative enterprises concentrated heavily on the growth of productive livestock, especially cattle and pigs. State enterprises possessed a large number of cattle which grew steadily during the investigated period. In 1975, their numbers were 94.15% greater than in 1965. Pigs increased 3.2 times during the same period. Although considerably smaller in numbers, livestock on cooperative farms has increased more rapidly. The number of horned cattle has risen 3.8 times and pigs 6.7 times. The number of draught horses has declined in both sectors. As in the other community countries, this was the result of intensified agricultural mechanisation.

In 1975 cereal and pulse crops production on state farms increased 46%, and on cooperative farms 75% in comparison with 1960. Correspondingly, the gross production of meat and fat increased 3.6 times on state farms and 10 times on cooperative farms. Milk production (in 3.5% butterfat equivalent) rose by 56% on state farms and by 101% on cooperative farms.

Increased average yields in productivity of the main crops and livestock played a fundamental role in the overall production increase in both types of enterprise.

Romania [7, 35,61]

The basic tasks of Romanian agrarian policy during the period of 1960 - 1970 were:

- To develop the industrial and technological base in agriculture, and

- To consolidate the economic and organizational structure of the cooperative enterprises.

Just as in other central planning countries, the maximum utilization of land by the use of irrigation, chemicalization, etc. became a priority. The production of grain occupied a central place in this policy. It was increased against a background of general improvement in the methods used in agriculture. The funds for irrigation and mechanization were of considerable importance. In order to achieve an improvement in the fertility of the soil during the period 1966 - 1970, considerable investment was made in irrigation systems. In the regions of abundant rainfall, drainage was carried out over an area of 1.3 million hectares. Towards the end of 1970, the irrigated areas amounted to approximately one million hectares. Over the whole five-year period (1966 - 1970) investment in irrigation amounted to nine milliard leas.

Substantial financial assistance was also given to agricultural production mechanization - mostly for the supply of tractors and chemicalization.

Changes were carried out in the structure of agricultural production. Priority was given to the production of fruit, vegetables, wine, sugarbeet and fodder crops - above all those crops rich in protein. The creation of new strains and varieties with high productive qualities was encouraged.

The experience in agricultural organization accumulated during the preceding period has been utilized to improve the management of production. The construction of agro-industrial complexes has begun, and greater cooperation between producers has taken place, i.e. between suppliers of agricultural raw materials in the food processing industry.

At the beginning of the 1970s a law was enforced which stimulated:

- The further development of raw material processing in the food industry;

- The better utilization of these materials in the agricultural enterprises themselves; and

- An improvement of the various services for agriculture through the enterprises owned by municipal authorities.

As in the other Community countries, the number of state and cooperative farms in Romania decreased as the enterprises were amalgamated in the last decade, especially in the period 1966 - 1975. (See Table 19).

Gross production on state and cooperative farms increased 3.2 times over the whole period. In both, livestock production increased more rapidly, 5.2 times and 4.4 times, respectively.

The volume of technical equipment continued to rise both on state and cooperative farms from 1965 - 1975, although rates of growth were more rapid in the cooperative sector. The number of tractors increased 14% in the state sector, and 60% in the cooperative. The rated horsepower of tractor-engines increased 31% and 88%, respectively. Grain combine units decreased 37% on state farms and increased 26% on cooperative farms.

The more rapid growth rate of tractors and rated horsepower engines on cooperative farms was aimed at reaching the technical equipment standards found in state enterprises, but in 1975 the state farms' number of tractors and rated horsepower engines was still higher than that of the cooperatives.

During the last ten years both sectors of Romania have continued to increase the number of productive animals. In 1975 the number of horned cattle in the state sector increased 50.15%, and 28.06% in the cooperative sector in comparison with 1965. In both types of enterprises great attention was paid to increasing the number of cows and female buffaloes. The number of pigs increased especially rapidly in state farms - 3.2 times, in comparison with 2.4 times in cooperative farms. Although not as rapid, the number of sheep continued to rise in both sectors, while the number of goats and draught horses decreased as in all socialist countries. The production quantities of grain and legumes marginally increased over the ten-year period, in the state farms - 11%, and in the cooperatives - 16%.

Compared with the rapid increase in livestock production, crop production rose relatively slowly, despite the rise in cereal production. Obviously these circumstances have affected the productivity of some kinds of livestock, and especially the average milk yield, which decreased 21% in the state farms, and 13% in the cooperative enterprises.

The USSR [4,5,24,33,44,60,62,63]

The investigation of agricultural development in the USSR is particularly interesting when assessing the situation of agricultural production and agrarian policy in the whole Community. The volume of agricultural products in the USSR far exceeds the production in all other CMEA countries together. The accumulated experience which this country has in applying the central planning method of production has been used in other CMEA countries in the development of agricultural enterprises. Soviet scientific and technical achievements in agricultural production have also had an impact on the agricultural development of the other socialist, and some non-socialist, countries.

Table 19

Basic Features Characterizing State and Cooperative Production Farms in Romania

	State Farms			Cooperative Farms		
	1965	1970	1975	1965	1970	1975
Number of agricultural enterprises (at year's end)	721	370	391	4680	4626	4419
Indices of gross production (1960 = 100)	181	233	320	239	238	320
Indices of gross crop production (1960 = 100)	172	193	232	238	227	297
Indices of gross livestock production (1960 = 100)	203	323	519	248	298	443
Sown areas including plantings in orchards between trees, thousand ha.	1581	1545	1647	6796	6318	6596
Number of tractors (at year's end)	24716	29704	28381	55439	75710	88461
Total rated horsepower of tractor engines, thousand h.p.	1324	1764	1746	2915	4369	5502
Number of grain combine harvesters (units, at year's end)	13345	10869	8339	23089	33904	29264
Number of lorries, including specialized and utility trucks (pick-ups), (at year's end)	2331	4559	...	9045	13800	...
Livestock, (at year's end) thousands:						
- horned cattle, including buffaloes	515	631	807	1956	2148	5282
- of which, cows and female buffaloes	181	217	269	596	829	999
- pigs	1098	2231	3380	1228	1613	2795
- sheep	1482	1616	1732	4952	5301	5570
- horses	35.8	35.2	20.2	436	359	261
- goats	0.3	1.0	0.1	2.5	1.6	1.0

Source:

Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл.79 и 80

The USSR is one of the most developed industrial and agricultural countries in the world, and its import-export trade has a considerable influence over international trade. The dimensional rates of development of agriculture and food industry production determine to a considerable degree the quantities of its imported and exported agricultural food products.

However, the USSR possesses considerably more unfavorable conditions for agricultural development. Production is carried out on a large scale, and it includes cultivation of virgin soils in regions with lower average annual temperatures and more extreme climatic conditions. Crop areas are extended in conditions rather different from those in the other CMEA countries.

The basic framework and principles of contemporary USSR agrarian policy were formulated in L. I. Breznev's report about "The Urgent Measures for Agriculture's Further Development in the USSR" at the March Plenary Session of the USSR Communist Party, 1965. The main goal of the USSR's agrarian policy was to secure a steady upsurge in agriculture, to equalize agricultural labor conditions with those in industry, and to change the character of the Soviet village.

This policy first of all envisaged an elimination of some previous faults in agricultural management such as:

- ignoring the effects of the economic laws of the central planning system in the sphere of agriculture;

- violating the principle of financial incentives, which connects each agricultural worker's personal interests with the interests of the enterprise and society;

- and failing to utilize favorable natural and economic conditions for agricultural production development, etc.

The agricultural branch is viewed as an inseparable part of the general economic system. The solution of agricultural problems is sought through the mutual solution of the main technical and socio-economic problems and tasks of the entire economy and society.

The March Plenary Session (1965) confirmed the main lines of contemporary policy and an all-embracing program for the further rapid raising of production potential and economic efficiency.[62]

After 1965 the Soviet state, economic and political authorities systematically solved the main problems for the new agrarian policy in stages by:

- creating the economic conditions necessary for stimulating agricultural production;

- elaborating and applying long-term programs for the mechanization of production processes and for the draining and irrigation of agricultural areas and for the chemicalization of agriculture;

- further developing agricultural science and rapidly introducing its own and other scientific achievements;

- further improving the forms and system of agricultural production organization and economic management on all levels.

Soviet agriculture in the near future will have to further rationalize the use of the basic factors for agricultural production: land, animals, water resources, techniques and technology, chemicals, manpower, in order to increase the yields of each unit of arable land and the productivity of animals, and to optimize the economic results of these activities.

A priority is the construction and operation of a modern system of economic relations in agriculture - by improving the workers' living standards through the further consolidation of large-scale agricultural enterprises.

Because of the construction of better agro-technical equipment and the transition to an industrial base, modifications to the organizational structure of agricultural production are necessary. These are sought through:

- a further intensification, optimal concentration, and specialization of production, without underestimating the importance of self-sufficiency in providing products indispensible for domestic consumption and local markets;

- the expansion of specialization and cooperation between enterprises for the realization of production activities, which are beyond the capability of the individual state and cooperative agricultural enterprises, e.g. constructing joint stock-breeding and production plants, and ensuring the availability of agro-chemical and building services for agricultural production.

The new agrarian policy emphasizes the important role played by the agricultural sciences in large-scale production. "Agriculture needs new ideas to improve production. These can be provided by a constant influx of basic knowledge of plants and animals through the disciplines of biochemistry, genetic research, molecular biology, etc. Agriculture expects scientists to create new, more prolific, and more stable varieties of plants."

Over the past two five-year periods the USSR has paid great attention to the development of animal husbandry. The solutions to livestock problems, its expansion, consolidation, and increase in economic effectiveness are sought along the following lines:

- the expansion and consolidation of production equipment, and especially technical equipment, through the construction of large, specialized joint enterprise units, which provide possibilities for a maximum introduction of industrial production methods;

- a fodder supply consolidation by ensuring the increase in fodder (especially grain), quality improvement of fodder and the introduction of modern technology in fodder production;

- and a further improvement in the breeding structure of productive animals with a view to the needs of specialization and production concentration and the requirements of the industrial production technology.

Through this policy, the USSR has secured the necessary quantities of cereal fodder for the livestock sector. It has not permitted a decrease in productive cattle, during the drought years of 1972 & 1975 so that considerable quantities of fodder had to be imported.

The solution to the fodder problem is being sought by compensating for the fodder deficiency through:

- an increase in the quality of fodder crops;

- a production increase in cereals, pulse crops, grass, and soya flour;

- the greater usage of oil-cake groats and other refuse of the edible-oil industry;

- and the increased production and addition of bonemeal and fishmeal nutrients, highly valuable vitamins, anti-biotics and nutritional phosphates to animal forage.

The USSR has increased capital investment considerably, in order to achieve the goals of the new agrarian policy. It has been increased from 82 milliard roubles in the five-year period 1966 - 1970 to 129 milliard roubles in the following period. From 1971 - 1975 34 milliard roubles were invested in livestock building - horned cattle sheds, pigsties, poultry-yards, sheep pens, and animal husbandry factories, as well as for the mechanization of production processes in these branches.

Capital investment in agriculture represented 20% of the total investment in the Soviet economy for the period 1961 - 1965, 23% for the period 1966 - 1970, and 26% for the period 1971 - 1975. This has enabled the agricultural sector to benefit from much larger quantities of technical equipment for soil-testing, crop harvesting, transportation, fertilizers and pesticides, to exploit new agricultural areas and to raise the production capacities of the existing ones.

Nevertheless it was thought that this influx of capital investment did not completely solve the agricultural problems. Therefore more effort is currently being given to the quality of the technical equipment and modern technology. Former mistakes in the use of capital investment in agriculture are to be eliminated. These can

be achieved through:

- more regular fulfilment of the plans for investing capital in important projects in the construction enterprise sector;

- the more rational utilization of irrigation systems and equipment in the state and cooperative enterprises;

- and adequate maintenance of these systems and equipment, etc.

Steady intensification has been the principle method of agricultural development in the USSR during the last 10 years. This has compensated for unfavorable agricultural conditions in individual years to a considerable degree. Even in 1972, when drought affected 50% of the total planted area, the average yields and total production of grain crops during that year were higher than the average annual yields and total production during the period 1966-1970.

The integration process amongst individual agricultural enterprises already includes almost all branches of production activity in agriculture, and it has developed widely. This cooperation extends to include shared large-scale buildings, draining and irrigation systems; and joint chemical use in agricultural production continues to develop.

The process of inter-economic cooperation affects not only the production part of agriculture but also its socio-economic base. Production cooperation between agriculture and industry leads to the construction of agro-industrial enterprises, which become amalgamated in agro-industrial units in the individual republics.

In the last few years priority has been given to integration processes such as intensification in fruit-growing, vine-growing, vegetable production and in all branches of livestock and fodder production.

Specialization, intensification, and inter-economic and inter-branch production cooperation have also contributed to the rapid increase in production and trade possibilities.

It is possible to define the direction of specialization and solve the problems of intensification and vertical integration in the USSR as a whole only after assessing the natural and economic conditions for agricultural development in each individual Soviet Republic.

The results achieved over the investigated period have proved how successful this agricultural policy has been. The number of state farms in the USSR in the period 1961-1975 increased and cooperative farms decreased. The total number of

state and cooperative enterprises however, decreased as a result of further amalgamation of enterprises and production. (See Table 20)

Sown areas in the state agricultural enterprises were extended 20% during the decade 1966-1975, but they were reduced by 6% in the cooperative enterprises. In 1975 the gross production of state and cooperative enterprises increased 2.5 times and 1.2 times respectively, in comparison with 1960.[4]

The gross plant-growing production of state farms in 1975 was 1.9 times higher than in 1960, and in the cooperative sector 1.1 times higher. The gross livestock production of state and cooperative farms increased 3.2 times and 1.5 times respectively during the same period. A characteristic feature of agricultural enterprises in the USSR in the last few years, especially after 1965, has been the increase in technical equipment. The number of tractors in the period after 1965 increased 52.42% in the state farms and 40.74% in the cooperative farms.

The growth of rated horsepower tractor-engines increased by 2.1 times in the state farms and 90.13% in the cooperative farms. This more rapid growth of rated horsepower tractor-engines is determined by:

- the rapid implementation of mechanization in a number of branches of agricultural production;
- the introduction of machine systems for this mechanization;
- and the presence of modern technology which was applied to a wider range of activities in agriculture, including irrigation.

The aims to fully utilize these techniques to raise labor productivity have resulted in the increase in machines and attachments powered by one tractor. In response to these requirements, the tractor industry has focused on increasing the power of a single tractor, which again has contributed to nominal power growth of the tractors used in agriculture.

Between 1960 and 1975 the number of grain combine harvesters increased 37.11% in state farms and 33.04% in cooperatives. The actual supply of agricultural production from combines,however, was higher in 1975, due to the introduction of more effective combines in the series "CK-3", "CK-4", "Kolos", etc.

Priority has been given to development of the livestock sector,which after 1974 became the leading branch in Soviet agriculture. The number of horned cattle in state and cooperative

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[4] Due to unfavorable weather conditions in 1975, the gross production of cereal and pulse crops in both state and cooperative farms was smaller than that of preceding years, especially when compared to 1973, which had excellent conditions especially for plant-growing production.

Table 20

Basic Features Characterizing State and Cooperative Farms in the USSR

	State Farms			Cooperative Farms		
	1965	1970	1975	1965	1970	1975
Number of agricultural enterprises (at year's end)	11681	14994	18063	36917	33561	28957
Indices of gross production (1960 = 100)	146	210	248	104	125	122
Indices of gross crop production (1960 = 100)	129	196	194	103	120	107
Indices of gross livestock production (1960 = 100)	172	232	322	108	132	148
Sown areas including plantings in orchards between trees (thousand hectares)	89062	91749	107240	105072	99053	98231
Number of tractors (at year's end)	681	803	1038	756	942	1064
Total rated horsepower of tractor engines, thousand h.p.	33704	47395	70924	34759	50252	66088
Number of grain combine harvesters (at year's end)	265	294	351	224	292	298
Number of lorries, including specialized and utility trucks, (pick-ups), (at year's end)	336	381	489	427	479	532
Livestock (at year's end) thousands:						
- horned cattle, including buffaloes and yaks	24501	29073	35588	38341	41733	48167
- of which, cows and female buffaloes	8918	10005	12096	13182	13546	15323
- pigs	12535	16603	16151	24629	29555	25729
- sheep	46207	53106	62396	53926	53488	51576
- horses	2405	2597	2571	4364	3608	2815
- goats	224	379	660	663	615	575
- camels	76.5	79.7	87.3	79	59	47

Source:

Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 79 и 80

farms increased 47.97% and 25.63%, respectively in the period 1966 to 1975. Although horned cattle numbers in cooperative farms still exceed those in state farms, the intention to solve livestock problems by relying more and more on the state sector is obvious. The rate of increase of cows and buffalo-cows in the state farms during this period was 35.64%, and in the cooperative farms, 16.24%.

Pig numbers increased more rapidly than any other variety of livestock up to 1974. In 1975, they declined considerably due to decreased grain fodder production. In spite of this the number of pigs in the state sector was 28.85% and in the cooperative sector 4.47% more than in 1965.

The curve of rapid increase of livestock development in state farms is evident especially in the increased number of sheep and goats. Compared with figures for the beginning of the period, in state enterprises sheep increased 35.04% and goats 2.9 times. At the same time the number of sheep and goats in the cooperative farms in 1975 decreased 4.36% and 13.27%, respectively,in comparison with 1965.

As in the other CMEA countries, in the last few years a decrease in the number of horses and camels (typical for some regions of the USSR) used as draught animals has taken place. The total number of horses in 1975 was 20.43% less than in 1965, and of camels 13.63% less. The trend towards a greater concentration in the state sector and a rapid decrease in the cooperative sector is evident for these animals.

The changes in the numbers of productive animals and in the structure of this branch have naturally affected the volume and structure of livestock production. The volume of meat and fat (in slaughtered weight) has increased steadily both in state and cooperative enterprises. As a result in 1975 it was respectively 2.1 times and 1.7 times greater than in 1960. Milk production (in 3.5% butterfat equivalent) increased correspondingly 1.5 times and 1.4 times. Production of hen eggs grew rapidly and in 1975 exceeded the 1965 production in state enterprises - 5.2 times - and 1.7 times in the cooperative enterprises. Moreover, in the same year, the number of eggs produced in the state sector exceeded the corresponding quantities in the cooperative sector by 4.3 times, which indicates that the USSR relies mainly on the state sector for its supply.

The national agrarian policy has also paid attention to the arable sector, viewing it as an important means of improving the food supply situation. The last two five-year periods have led to a considerable production of cereals in the USSR. Even during 1975, the cereals and pulse crops produced in the state farms increased 41.98%, and in the cooperative farms 3.4% in comparison with 1965. In 1973, this increase was 2.4 times and 1.6 times respectively.

The main reason for production growth of plant-growing and animal husbandry in the USSR (as in the other Community countries) can be attributed to increased average yields and productivity of primary agricultural crops and livestock.

Czechoslovakia [9,28,58,69,70,72,82]

The problems of food and agricultural development in the CSSR became much more acute by the end of the 1960s. During the second half of 1968, a special plan for food production development was effected in the CSSR for the period 1968-1970. The country's agrarian policy gave priority to the material and technical factors of production growth and agricultural food complex development. 20 billion crowns were directed towards the mechanization of agricultural production, including the purchase of 58,000 tractors, 8,000 grain combines, 3,000 potato combines, 800 sorting lines for potatoes, a considerable number of machines for the complete mechanization of basic plant-growing processes, for fodder crops and sugarbeet harvesting, and for a number of labor-consuming processes in animal husbandry.

The investment in construction facilities for milk and dairy products, and processed meat was increased in order to modernize the food industry. Total food industry volume increased 18% in comparison with the previous five-year plan.

Great attention is being paid to soil fertility improvement, and the increase of chemical and biological factors for plant production. Special measures have been elaborated for the development of fodder storage.

The accelerated construction of grain elevators was also started and the fodder industry was developed. The chemical protection of plants and an improvement in the methods of preservation has been carried out. The greatest emphasis in the food industry sector has been on the industrial development of dairying, including the production of dried milk.

Capital investment has been concentrated in the most productive agricultural activities and strongly regulated planning for constructing new buildings has been supported.

The country's foreign trade activity has been directed so that agricultural exports should contribute to an improvement in the balance of payments and to stengthening the role of foreign trade turnover with the CMEA countries.

The function of economic stimulation is being intensified and closely incorporated into a new system of national economic management.

Activities for raising the average earnings of the agricultural labor force to equal those of industrial workers are being

promoted, and agricultural workers' pensions are to be raised.

The program aims to overcome some negative phenomena apparent in the CSSR's agricultural development in the preceding period, e.g:

- the disproportion between plant-growing and livestock development;
- the lack of an adequate and stable supply of fodder for animal husbandry;
- insufficient cereal production;
- the reduction of potato production areas;
- the unsatisfactory quality of potatoes for consumption;
- and the restriction of sugarbeet production, etc.

Complex mechanization,expanded in the agricultural process, and the higher labor productivity had to compensate for the decreasing manpower, engaged in agricultural production and the disproportion of men and women working in agriculture.

An important place in this system has been given to prices and price policy. The increase in some purchase prices has contributed to a gradual equalizing of economic labor conditions in state and cooperative enterprises with those in industry.

The agrarian policy in the country has extended this program considerably and has assigned new tasks to agriculture during the last five-year period (1971-1975). The basic task was the achievement of the most effective crop-growing production. The essential requirements of this development are maximum production of foodstuffs from plant-growing and an adequate supply of fodder for livestock. Grain production growth and the creation of the necessary national equilibrium are considered to be fundamental conditions. The basic task of the last five-year plan was to satisfy the increased consumption of agricultural and food products by greater national production.

By limiting some food imports in the period 1971-1975, the CSSR realized some structural changes in sown areas. A considerable growth in average yields of potatoes, sugarbeet, hops, etc. was reached by intensified mechanization, by application of fertilizers and pesticides, and by the improved farming methods.

Great attention has been paid to some economic organizational problems, e.g. agricultural specialization, concentration, division into regions, etc.

A task was set to equalize the considerable differences in the level of economic activity of separate state and cooperative

agricultural enterprises, working in equal or almost equal natural economic production conditions.

An increase in the purchase price of horned cattle and pigs for butchering has been made. Subsidies for investment with a definite purpose were given, etc. New economic activities, introduced to stimulate production and food industry growth, were adapted to the whole system of management of the national economy.

The greater national production of chemicals has contributed to the more extensive use of chemicals in agricultural processes, for protecting the crops and stimulating their yields. As in the other centrally planned countries, the program for agricultural development has brought some very substantial improvements in the production activities and the economic results in this branch.

The number of state and cooperative farms in the CSSR decreased between 1966-1975. (See Table 21). Sown areas in both sectors were extended, which testifies to the fact that this country developed within the framework of agricultural production amalgamation. As in the other CMEA countries this process was carried out steadily, but it has been accelerated in cooperative enterprises over the last five-year period.

The increase in technical equipment in agriculture in both sectors has been one of the most important targets. The number of tractors on state farms in 1975 was 4.7% more than in 1965, and on the cooperative farms 13.61%. Because of the comparatively greater supply of tractors at the beginning of the 10-year period, the percentage growth rate is lower than in other Community countries. Total rated tractor horsepower increased in state and cooperative farms - 49.41% and 66.22% respectively.

The number of grain combine harvesters in 1975 was 52.43% greater than in 1965 on state farms and 93.36% greater on cooperative farms. Since the CSSR has introduced more advanced combines over the last few years, the actual increase in technical equipment is higher than the nominally increased number of combines in both the state and cooperative sectors.

The number of all varieties of productive animals in the state enterprises in the CSSR has increased during the last few years. However, growth rates were comparatively slow. In 1975 the number of horned cattle increased 10.20% and cows 8.09%; the number of sheep rose by 9.71% and the number of all pigs by 2.75%. The growth rates of livestock in the cooperative sector are almost equal to those in the state sector in cattle-farming, but are more rapid in pig-farming - 25.98% and sheep-farming - 33.7%. Gross agricultural output in state farms increased 1.6 times in the period after 1960, plant-growing - 1.5 times and animal husbandry - 1.8 times. The gross agricultural output in cooperative farms increased more slowly but also steadily - 1.5 times, plant-growing - 1.3 times and animal husbandry - 1.7 times.

Table 21

Basic Features Characterizing State and Cooperative Farms in Czechoslovakia

	State Farms			Cooperative Farms		
	1965	1970	1975	1965	1970	1975
Number of agricultural enterprises (at year's end)	329	336	250	6704	6270	2736
Indices of gross production (1960 = 100)	109	142	162	96	121	147
Indices of gross crop production (1960 = 100)	102	128	146	84	107	131
Indices of gross livestock production (1960 = 100)	115	155	176	112	139	168
Sown areas including plantings in orchards between fruit trees thousand ha.	985	1016	1009	3022	3002	3171
Number of tractors (at year's end)	26345	27940	27583	82290	89589	93487
Total rated horsepower of tractor engines, thousand h.p.	1022	1230	1527	3040	3733	5053
Number of grain combine harvesters (at year's end)	2384	3479	3634	6537	9138	12640
Number of lorries including specialized and utility trucks, (pick-ups), (at year's end)	3299	3689	5820	6913	12086	20773
Livestock (at year's end) thousands:						
- horned cattle, including buffaloes	833	861	918	2586	2512	2942
- of which, cows and female buffaloes	346	364	374	1066	1035	1191
- pigs	837	784	860	3052	3039	3845
- sheep	103	154	113	276	434	369
- horses	25.6	16.8	7.5	88.8	51.4	21.3
- goats	...	...	...	4.5	2.0	0.4

Source:

Статистический ежегодник стран-членов СЭВ, Изд. Статистика, М., 1976, табл. 79 и 80

In the last two five-year periods, the gross output of cereals and pulse crops in state farms has increased 1.7 times, and in cooperatives 88.01%. Meat and fat production (in slaughtered weight) during the same period has increased 42.95% in state farms and 44.89% in cooperatives. The increase in milk production (in 3.5% butterfat equivalent) in state farms was 49.65%, and in cooperatives 59.75%. The volume of hen eggs in state farms has increased 2.1 times, and in cooperatives 43.25%. As was the case for the increase of gross production volume in state farms, the decisive contribution in the cooperative sector was from the increased average yields in plant-growing and higher average productivity in animal husbandry.

4.2. GOALS AND AIMS OF THE AGRARIAN POLICY IN THE PERIOD 1976 TO 1980.

The current five-year agrarian policy of the CMEA countries is closely linked to the whole Community economy, where strategic targets have aimed at achieving the material, technical and socio-economic conditions necessary for establishing society on a highly developed socialist basis. In order to fulfill this target agriculture in the individual countries (and in the Community as a whole) has to:

- produce considerably more plant and livestock goods for direct consumption;
- meet the increasing need for raw materials in manufacturing industry (particularly food) more satisfactorily;
- improve the nutritional value of the foodstuffs and the raw materials for food-processing.

As in the last five-year period, the intensification of agricultural production processes continues to be the basis for the further development of this branch in all Community countries.

This will be applied in practice by:

- increasing the supply of machinery and other equipment in order to make conditions in the agricultural sector more equal to those in industry;
- creating and introducing new more productive high-quality varieties of crops and animals;
- optimizing the use of chemicals for improving crop yields and animal productivity, and for pesticides to protect crops and livestock;
- further extending irrigation systems in regions with insufficient water supply or surplus humidity;

- accelerating the application of modern scientific and technological achievements, and the empirical knowledge of international agriculture.

- training adequate manpower for the implementation of this policy in agriculture, and optimizing the age, sex, and qualification structure of the the laborforce engaged in this sector.

The basic criteria for the fulfillment of this program are:

- an increase in gross and net social product per unit of agricultural land area;

- an increase in gross and net social product per unit of capital investment;

- an increase in gross and net social product per unit of manpower expenditure.

One synthesized indicator for the results from the entire production activity of the agricultural enterprises is the further increase in productivity and the realized net income per unit of agricultural land area, capital investment and labour used in this sector.

The main goals of the food industry during the current five-year period in the individual countries and in the Community as a whole are:

- maximum utilization of raw materials supplied by national agriculture or imports;

- an improvement in the nutritional value and trade volume of food commodities;

- diversification in the range of food commodities produced, in order to satisfy the gradually changing requirements of consumers;

- the application of modern methods of foodstuff preservation to reduce loss from damage.

The contemporary agrarian policy envisages the maximum utilization of national resources together with the existing form of international economic, scientific and technical collaboration for the solution of food and agricultural problems.

During the current five-year period the most important tasks in agriculture are:

- to extend the division of labor within the Community framework and the trade with the other countries, by increasing the export and import of fresh and processed agricultural products, and the range of goods offered on the domestic

market, and by making use of the optimal natural and economic conditions to specialize in certain agricultural goods and foodstuff production for the international market;

- to develop economic and technical collaboration on a bilateral or multilateral basis between the individual European CMEA countries with other developed or developing countries, and with specialized UN and other international organizations;

- to participate more actively in the activities of UN specialized organizations for the fulfillment of a number of global and regional programs in the sphere of food and agriculture (e.g. the struggle against hunger, the struggle against drought, the programs for environmental preservation and for the utilization of the oceans' food resources, etc.) and to contribute to the solution of the most important global and regional problems in this field.

Each country relies upon permanent long-term collaboration with the rest of the Community members for the solution of all food and agricultural problems. They are all attempting to make their national economies more independent of random fluctuations on the international market, but at the same time retaining open international economic trade relations. The most important factor in these relations is that of equal trading rights and mutual benefits.

As well as following a common general principle, the contemporary agrarian policy in each country contains certain characteristic national elements.

In the period 1976-1980 agricultural development in Bulgaria must contribute to the fulfillment of the basic social and economic targets of the five-year plan, which are:

- to satisfy the material and intellectual needs of the population by developing each sector of the national economy on a proportional basis;

- to accelerate the increase in labor productivity, efficiency, and quality, through modernization, reconstruction, concentration and the more rapid introduction of scientific and technical achievements. [1, 2]

Agriculture and the food industry must also aid the achievement of high, stable rates of national economic growth, so that a progressive raising of agricultural workers' living standards is ensured, and the requirements of the non-agricultural population are satisfied.

Production volume must be increased, and above all its nutritional and commercial quality levels raised through:

- more rapid scientific and technical progress in the agricultural production process;
- the modernization and reconstruction of basic productive funds;
- territorial distribution, agricultural specialization and concentration;
- and the more rational utilization of manpower.

The total volume of agricultural production is expected to increase by about 1/5 in comparison with the corresponding volume in the preceding five-year period, and the correlation between animal and plant production (in monetary value) will have to be 49.51%.

Animal husbandry production growth is the main task for agricultural development during this period. Its solution will be sought in several directions:

- through an increase in the number of productive livestock (above all the number of cows and sheep);
- through a further improvement in the type and breed of livestock with a view to higher productivity in this complex agricultural branch;
- through a greater use of hybrids especially in pig-breeding and broiler-chicken breeding;
- through the improvement of preventive veterinary medicine and care for productive livestock.

The number of productive stock will increase as follows: cows - up to 1020 thousand, pigs - up to 5800 thousand, sheep - up to 12 million and poultry - up to 42 million.

Average annual meat production (in slaughtered weight) during this period should rise to 640 - 670 thousand tons in comparison with 574.2 thousand during the last five-year period; average annual milk production (in 3.5% butterfat equivalent) will reach 2500-2600 million litres in comparison with 1727.6 million litres; and hen eggs production 2100-2200 million in comparison with 1721.2 million.

In the plant-growing sub-branch, priority will be given to cereal development, particularly grain fodder[5]

[5] The problem of satisfying the population's need for bread and grain was solved in this country as early as the mid 1960s and therefore is no longer a matter for concern in Bulgaria's agrarian policy.

In order to completely solve the forage problem and to meet the need for fodder for productive animals (especially protein fodder), increased grain production will be one of the most important aims during the 1976-1980 period. This will be achieved by extending basic fodder crop cultivation to irrigated areas. The share of soyabean and lucerne in the livestock forage structure will be raised, and the maximum utilization of crude fodders and natural pasture will take place.

The next most important goal is the further development of fruit and vegetable production and the greater use of these products in fresh and preserved states.

In order to maximize the favorable opportunities for vegetable-growing in the country, over the next five-year period a considerable growth in vegetable production is planned. Construction of large-scale vegetable-growing complexes, which could produce large quantities of high-quality raw materials has been organized. The establishment of modern processing factories with large capacities has been projected.

The task of qualitatively improving the existing vineyards and orchards is planned without any considerable extension of their cultivation areas. New varieties of perennial plants will be created for cultivation in regions with the most favorable conditions. The process of production specialization and concentration will be intensified in these branches, and the process of its vertical integration through the construction of processing factories (e.g. canning factories, wine presses and others) next to fruit and grape cultivation enterprises or as the property of the agro-industrial complexes or industrial-agrarian complexes will also take place.

The average annual production of the most important crops is expected to reach the following levels:

- cereals and pulse crops - 9300 -9600 thousand tons, in comparison with 7465.2 thousand tons; during the previous five-year period;
- fruit (including melons and water melons) - 1400 - 1500 thousand tons, in comparison with 1072.6 thousand tons, during the previous five-year period;
- grapes - 1200 - 1400 thousand tons, in comparison with 1045.2 thousand tons during the previous five-year period
- vegetables - 2050 - 2250 thousand tons, in comparison with 1576.8 thousand tons during the previous five-year plan period;
- sugarbeet - 2700 - 2900 thousand tons in comparison with 1711 thousand tons during the previous five-year period, etc.

During the current five-year period the stabilization and expansion of the material and technological base and the improvement of the technical level in all agricultural branches will take place.

By raising the capital investment in agriculture and especially the productive funds, Bulgaria aims towards 1980 to increase the irrigation areas by 200 thousand hectares. Another 200 thousand hectares of existing irrigation areas will be reconstructed and modernized. The number of tractors will rise up to 150 thousand (15 h.p.) and combine harvesters up to 24 thousand. The volume of national machinery production for agriculture will be doubled.

The production of nitrogenous fertilizers should increase to 716 thousand tons, and phosphate fertilizers up to 500 thousand tons. The quantity of mineral fertilizers (in nutrient equivalent) per hectare of arable land must increase to about 250 kg.

In order to achieve a rational utilization of the existing forage supplies and to find a satisfactory solution to the protein requirements for livestock, the country's microbiological industry will have to extend production of amino acids, enzymes and other chemicals.

Gross food industry production during the current five-year-plan will increase around 40%, meat and meat products - 50%, milk and milk products, vegetable oils, and canned fruit - 40%, and canned vegetables and sugar - 37%.

It is anticipated that in 1980 the per capita consumption of the basic products will increase as follows: meat and meat products - to 70 kg; fish and fish products - 8 kg; milk and milk products - to 220 kg; eggs - to 200; vegetables - to 150 kg; fruit - to 190 kg; vegetable oils - 14 kg; and sugar and sugar products - to 34 kg. The consumption of meal is limit to 150 kg.

With the increased use of technical equipment and the improved forms of production organization and management, labor productivity in agriculture is expected to rise by 40% in comparison with the preceding five-year period.

The main targets for food and agriculture development in Hungary during the period 1976-1980 have been determined by the XI Congress of the Hungarian Socialist Labour Party. [8]

According to the new economic management methods used in this country after 1968, the central planning targets have been implemented indirectly by the individual enterprises through the systems of prices, credit, investment, subsidies, etc.

These goals are:

- to continue the improvement of socialist enterprises;
- to develop and modernize its material and technical base;
- to increase the use of modern chemicals;
- to increase crop yields and livestock productivity;
- and to improve the preservation and processing of agricultural products, etc.

During the current five-year plan agricultural production in Hungary is expected to increase 3.4% annually, including 3.7% in plant-growing and 2.9% in animal husbandry. The percentage share of agriculture in the structure of the gross social product will decline by 14%, as a result of the faster development of industry and other non-agricultural branches.

In 1980 plant-growing production will reach 56.9%, and livestock production 43.1% of gross agricultural production.

Although bread-grain and fodder-grain crop production in the preceding five-year period was almost sufficient to satisfy domestic demand, the agricultural development program foresees a further growth in grain production, fruit, vegetables and sugarbeet until national needs are completely satisfied and exports are increased.

During the last five-year period Hungary achieved 100% self-sufficiency in meat and meat products, but still greater meat production has to be realized. There should be a 13% increase in horned cattle numbers (27% - cows) over the five-year period, and a 15% increase in pig numbers (10% - sows). A considerable increase in milk production is also planned. Great investment will be made in agriculture, so that proportional development between the agriculture and non-agricultural sectors can take place, thus ensuring an adequate supply of agricultural and food products for the population.

For the whole period investment will amount to 107 milliard forint. Out of this total, 75 milliard will be allocated to the cooperative enterprises, for reconstruction and modernization purposes, for the purchasing of modern machinery, and also for the more extensive utilization of chemicals in plant-growing and animal husbandry.

Recently, much emphasis has been placed on improving and increasing freezing and canning processes to take maximum advantage of the increased fruit and vegetable supply.

It is planned that the general level of mechanization of combine harvesters will reach 96-98%,of stalk and cob combine harvesters - 76-80%, of sugarbeet harvesters - 97-98%, and of potato harvesters - 58-60%, etc. Modern production methods in main crop cultivation, especially in maize cultivation, will be widely applied. A wider application of industrial methods and a much greater degree of hybridization is recommended in the livestock farming branch.

The basic and most popular form of agricultural production organization for the future will be in the cooperative agricultural enterprises. At the same time the role of the state agricultural farms will become considerably greater. These enterprises have to take the initiative in developing and spreading progressive methods in agricultural organization and management. State farms and advanced cooperative farms are responsible for the working out, experimenting, reproducing and

distributing of highly-productive varieties of crops and breeds of livestock, most suitable for the conditions in Hungary.

An important function of these enterprises is to aid those farms still lagging behind production by passing on the expertise of the best workers in the field, and through the creation of inter-cooperative production enterprises for agricultural services, preservation and processing.

A considerable growth in labor productivity in agriculture, and equalization of labor conditions for agricultural workers with those of industrial workers is planned.

The decision worked out at the last congress of the cooperative agricultural enterprises (in November 1976) are very important for the realization of the agrarian policy in the next five-year period.

Up to now, the production on state farms per unit area has been 1.5 times higher than that on the cooperative farms. The state farms have overtaken the cooperatives in the sphere of specialization, production cooperation, land reclamation and other technical innovations. Because of this the congress has set many important targets for Hungarian cooperatives.

They are:

- the achievement of complete harmony between cooperative enterprises and state authorities;
- further gradual production amalgamation, and creation of joint production between cooperative farms on the one hand and commercial enterprises on the other;
- the consolidation of the socialist character of the enterprises, and the development of cooperative democracy;
- the serious observation of state economic and financial regulations;
- the encouragement of material incentives on cooperative agricultural enterprises through their exemption from income tax on vegetable production and on production from reclaimed land (for 5 years after reclamation), etc.

In order to increase the cooperative members' activity in their leisure time, the state has carried out projects to stimulate an increased interest in personal farm development - especially in livestock farming, fruit and vegetable production. By 1980 it is anticipated that personal farming will produce about 1/3 of the country's gross agricultural output.

Municipal taxes on these personal farms will be determined for a term of several years. Development of service enterprises connected to agricultural production are planned next to the cooperative farms and also next to food processing enterprises.

A strategic task of the German Democratic Republic's agrarian policy during the period 1976-1980 is agricultural production intensification and a gradual transition to an industrial large-scale production base for plant-growing and animal husbandry in highly specialized cooperative farms, state or joint state farms and cooperative enterprises.[3]

Two principal criteria for the fulfillment of this policy are:

- a systematic increase in agricultural and food production capacity;

- and also a simultaneous increase in the efficiency of national economic activities.

The main political task of this five-year plan is the creation of conditions for gradually overcoming the differences between the urban and rural areas, and for a further rapprochment between cooperative farmers and industrial workers.

Food and agriculture development during this period is directed towards:

- increasing the production of basic fodders and building up fodder reserves;

- improving the quality and increasing the supply of potatoes for fodder and for food production;

- increasing sugar production by improving the sugarbeet yield and its sugar content;

- developing vegetable production and fruit growing, particularly near the large urban and industrial centers as well as in the regions which possess essential natural and economic conditions for producing these crops.

Unlike some other CMEA countries, the GDR gives priority to plant-growing development as a basis for further intensification of the process of concentration and specialization in animal husbandry. It plans by 1980 to increase by 20% average yields in plant-growing in comparison with those achieved during the last five-year period. Average annual yields in plant growing must reach 4600-4800 kg grain units per ha[6] of arable land in the period 1976-1980, in comparison with 3970 kg grain produced in the 1971-75 period. At the same time meat production must reach 11.4 million tons (in real weight), milk - 39.8 million tons, and eggs - 21.36 milliards.

The state deliveries of livestock for slaughter are expected to average from 1982 thousand tons in the period 1971-75 to 2300 thousand tons towards 1980, and eggs from 3918 million to 4300 million in order to satisfy domestic demand. The food industry must produce and process annually 2.3 million tons of meat (in real weight), 8.2 million tons of milk and 4.3 milliard eggs.

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[6] The GDR's plant-growing yields are calculated in grain units.

In the years 1976-1980, 30.7 milliard marks will be invested in agricultural and food production in order to encourage integration and to raise the level of intensification.

Forty-five thousand tractors and 7.5 thousand combines, some with greater horsepower are also expected to be produced during the current five-year period. By 1980 agriculture in the GDR will receive annually 650 thousand tons of potassium, 940-970 thousand tons of nitrogenous fertilizers and 530 thousand tons of phosphorous fertilizers. The quantities of pesticides will reach 428 thousand tons. A further improvement in labor distribution, agricultural production concentration, horizontal and vertical integration is envisaged. Regarding vertical integration, collaboration of the agricultural and market-gardening production groups with processing and trade organizations and cooperative shops will be encouraged. Further amalgamation of the production unit is expected, through the establishment of new joint food and agricultural trusts. Better production cooperation is expected between cooperatives, state farms, agro-chemical and regional enterprises for agricultural techniques, land reclamation and food processing. At present the state and cooperative enterprises collaborate in undertaking vegetable production, land reclamation, construction, and in the establishment of new, highly-specialized farms.

The agrarian policy of the GDR supports the development of both state and cooperative ownership and views them both as contributing to the goal of agricultural production development on an industrial basis. This viewpoint however, does not preclude the possibility that both types of enterprise will merge into one state organization.

The development of agriculture and the food industry in Poland in the period 1976-1980 is directed above all towards:

- growth in the production of milk, vegetables and fruit;
- intensive development of cereals and fodder production;
- and the rational utilization of fodder reserves. [6, 79]

Poland's agrarian policy will encourage social reforms in agriculture and support the socialist sector - state agricultural farms and cooperatives - as a form of further intensive development of agricultural production. The state farms should extend their land by 1.6 million hectares and strengthen their role as the main supplier of high-quality planting materials, seeds and breeding stock for the entire agriculture sector.

At the same time agricultural groups will increase their support to the private farms to encourage more rational production organization and more efficient land utilization for further production specialization and concentration.

During the current five-year period, 55% more capital will be invested in agriculture than during the preceding period. Of this, 2/3 will be allocated to state farms.

A further 142 milliard zloty will be invested to increase mechanization in agricultural production. The tractor supply should rise by 63%. New greenhouses will be constructed over an area of 600 hectares. 180 milliard zloty will be invested in other types of agricultural construction, which will amount to 50% increase above the 1971-1975 level. Capital investment in land reclamation alone will increase 40%.

Poland's agrarian policy will give further support to private farms. At the same time it will encourage further co-operation and collaboration between the different forms of agricultural production - state farms, cooperatives, agricultural groups, and private farms.

During the current five-year period, the development of agriculture will be closely linked to that of the other basic branches of material production - industry, construction, transport, etc. The detailed program for the development of these branches expects a more adequate supply of the necessary techniques and chemicals for the agricultural enterprises on the one hand, and capacity expansion of processing (especially in the food industry), with a view to utilizing greater quantities of raw materials produced by agriculture on the other hand. It is anticipated that gross agricultural production during this period will increase by 15-16%; livestock production - 16-18%. Grain production will rise about 1/3 in comparison with 1975. Average yields of cereal crops are expected to increase up to 31-32 cwt/ha, average potato yields up to 210 cwt/ha, and those of sugarbeet up to 360 - 380 cwt/ha. By 1980, head of cattle should reach 15 million, pigs - 23 million, and sheep - 4 million. The volume of meat production (all kinds of meat in slaughtered weight) will increase 20% in comparison with 1975. Up to 1980, the agricultural products delivered to Poland's home market must increase 35-37%.

The state will provide greater supplies of chemical fertilizers. By 1980, 1 hectare of arable land will be supplied with 25 kg of nitrogenous, phosphorous and potash fertilizers (in nutrient equivalent). The services to the agricultural enterprises will be improved. Scientific and technical advances will be popularized amongst producers. Further modernization and development of the storage and refrigeration will take place. Greater advantage of economic stimuli in production will be made, etc.

The basic task for agricultural development in Romania in the current five-year period (1976-1980) is to provide for the production of sufficient quantities of agricultural and food products to satisfy the higher level of nutrition of the population, who are consuming more animal products, fruit and vegetables in place of cereals. [7]

In this period agriculture should develop very rapidly. Average annual growth of agricultural production should reach 5.1% to 7.6%, of which fruit production (including grapes) - 14.9%, livestock production - 9.1%, sugar - 5.4%, etc.

The volume of gross agricultural production should reach 114 - 128 milliard lei in 1980. Towards the end of the five-year plan, the country expects to produce 20 - 22.4 million tons of grain, 1 - 1.1 million tons of sunflower seed, 8.6 - 9.4 million tons of sugarbeet, 4.5 - 4.7 million tons of potatoes, 4.2 - 4.3 million tons of vegetables, 3.8 - 4.0 million tons of fruit (including grapes). The average yield of grain crops should be 35 cwt/ha.

The number of cattle should reach 7.5 million head, pigs - 12 - 13 million, sheep - 19 - 19.5 million, poultry - 45 - 50 million. Meat production (in real weight) should reach an annual average of 2.5 - 2.7 million tons, milk - 58 - 62.2 million litres, eggs - 6.5 millards.

In order to achieve these aims the Romanian agarian policy will apply different financial and organizational measures. A considerable expansion and improvement of the material and technical factors is also envisaged. In order to achieve the above-mentioned indicators about 11 - 11.5 million tons of chemical fertilizer - 280 kg/ha - are to be used. The number of tractors used in agriculture must increase from 120 thousand (in 15 h.p.) to 130 thousand - an average of 1 tractor per 76 ha of arable land. The irrigated areas of the country must be increased by 1.25 million ha, reaching a total of 3 million ha towards 1980. A considerable extension is envisaged for the areas of greenhouse vegetable production. An improvement in regional production distribution, and further specialization concentration in the plant-growing and livestock branches will play an important role in agriculture development.

Agricultural enterprises specializing in certain types of produce according to the regional conditions will be established. There will be micro-zone types of farms for the production of:

- meat, milk, maize, and industrial crops (mainly sugarbeet and sunflowers);
- meat, main industrial crops (mainly sugarbeet and sunflowers);
- meat and milk production;
- meat and maize;
- vine-growing and meat production;
- fruit cultivation and meat and wheat production;
- milk, potatoes and wheat;
- milk and wheat production, etc.

The last micro-zone type affects mainly the private sector, where specialization and concentration cannot be determined in a planned way.

The national program for animal husbandry development envisages a considerable increase in all kinds of productive animals - cattle, pigs, sheep, and poultry, and also structural changes in the animal herds. The plan foresees:

- a gradual liquidation of the old and unproductive animal stock;
- an improvement in the forage balance through stabilization of corn production;
- an increase in the share of lucerne and clover;
- more effective use of pasture;
- the application of more progressive methods of gathering, preservation and processing of the yields;
- more effective use of "secondary forage", etc.

For the construction of new livestock farms and complexes, 10 milliard lei will be invested. Farms for 1 million laying hens, broiler factories for 7.5 million fowls, cow complexes for 4 thousand head, farms for the fattening of 150 thousand calves and correspondingly for 120 thousand lambs, pig complexes for 1.5 million fattened pigs, annually,etc. will be constructed.

About 7.7 milliard lei will be spent on the purchase of new productive livestock and on production mechanization in animal husbandry.

The program for vegetable production development expects:

- an extension of the areas, occupied by these crops;
- further production specialization and concentration in the regions with optimal conditions;
- a considerable extension of the greenhouse areas, including sun hothouses;
- an increase in the supply of mineral fertilizers used in vegetable production and a greater degree of mechanization.

The number of crops cultivated in the vegetable sections will be limited: the sections producing vegetables for the urban population should cultivate from 3 to 5 main crops; those producing vegetables for export, correspondingly from 2 to 3 crops; and those producing vegetables for processing or seeds from 2-3 crops. Marked attention will be given to more serious observation of financial and labor regulations in all the food

and agriculture sub-branches, aiming to save material resources and labor and to improve the production quality.

The tasks to be solved during the period 1976-1980 in the USSR are all embracing in dimension, and important for agricultural development in the whole Community.

The USSR's five-year agricultural plan contains two basic and interrelated goals:

- reliable supply of food and agricultural raw materials must be guaranteed;

- material and cultural conditions, and living standards between urban and rural areas must be equalized. [4]

The new program for agricultural development in the USSR is based above all on the experience and technical advances of the last two five-year periods, but it also takes into account the difficult natural conditions and their risks to development of agriculture in this vast country. The problem of the gathering, preservation and entire utilization of agricultural production, and of preventing or reducing its losses are of great importance. Towards 1980, agriculture has to use more rationally the existing material, technical, organizational, economic, financial and labor factors and to increase production far above the level of the preceding five-year periods. Total annual agricultural production is projected to increase 14-17%. Average annual production of cereals should rise correspondingly - 18-21% to reach 215 - 220 million tons; sunflowers - 27%, reaching 7.6 million tons. Sugarbeet production will have to increase 25-29%, and must reach 95 - 98 million tons. Potato, vegetable and fruit production must also grow considerably, etc. [5]

One of the most important tasks of plant-growing will be the creation of a stable supply of sufficient fodder, based especially on crops with a higher percentage of proteins - peas, clover, lucerne, etc. Production of crude and succulent fodder should completely satisfy domestic animal husbandry.

The country's fodder balance is to be supplemented with by-products from the food, meat and milk industry, which may be utilized by productive livestock.

In order to satisfy domestic demand for fresh and processed animal products to a higher degree, average annual production of meat (in slaughtered weight) should increase 7 - 11%, reaching 15 - 15.6 million tons by 1980. Average milk production during the same period should increase 7 - 10%, reaching 95 - 96 million tons, eggs - 13 - 18%, reaching 58 - 61 milliards, numbers, etc.

This production must be secured mainly by state and cooperative enterprises. Therefore, the growth in the absolute number of productive livestock, the application of further production

specialization by intensive methods, and an improvement in veterinary services is envisaged.

Taking as an ultimate goal the complete satisfaction of the rising demands for fresh and processed agricultural products, the agrarian policy of the USSR stresses the need to increase marketable agricultural production in the years of the new five-year plan. The average annual volume of the production purchased from agricultural enterprises is projected to reach 90 million tons of cereals, almost 90 million tons of sugarbeet, 17 million tons of vegetables, almost the same quantity of potatoes, 5.6 million tons of fruit and berries, 5.4 million tons of grapes, 6 million tons of sunflowers, etc. During this period the purchase of basic livestock products should reach: 17.4 million tons of meat (in real weight), 60.5 million tons of milk, 34.3 milliard eggs.

During the last few years the Soviet commercial organizations have accumulated very useful expertise in purchasing agricultural production. Therefore the principle of permanent plans for agricultural production purchasing is maintained. Higher purchasing prices are set for the amount produced over and above the plan requirement to encourage extra production. The contracts for 5-year periods for production purchasing between producers and the commercial enterprises will be widely applied.

A further improvement of the system of production distribution into districts and regions, the further development of specialization and concentration, and the introduction of new sorts of agricultural crops are anticipated. In order to increase the effect of the investment in land reclamation and chemicals, crop varieties with a higher genetic potential must be used.

The agricultural production organization must be carried out so that a further preservation of soil fertility is ensured for future agricultural production growth. In the period of the new five-year plan, capital investment in this branch will be extended in order to limit the influence of unfavorable conditions. Real material and technical prerequisites for the stabilization of yields of basic crops will be developed. For the whole period 1976-1980, 172 milliard roubles will be invested in agriculture, which is 31.3% more than the investment made in the last five-year period.

Marked attention is to be given to land reclamation. Irrigation areas are to be extended and the irrigation of 4 million ha will be financed by the state. Another 4.7 million hectares must be drained. A further 34.6 million ha of pasture, desert, semi-desert and mountainous land have to be supplied with water.

As in the last 10-year period, land reclamation projects in this country are directed to regions, where the lack of irrigation is most acute, and where the capital investment would give the best return. These are the south eastern regions of the European territory of the Russian Soviet Federal Socialist Republic,

North Caucasus, Southern Ukraine, Moldavia, the Cazach Soviet Socialist Republic, the Middle Asiatic Republics and beyond the Caucasus.

An accelerated introduction of modern scientific and technical achievements in the sphere of land reclamation is expected. A considerable part of the present capital investment is directed towards the modernization and reconstruction of the existing land reclamation systems, with a view to improving their efficiency.

More land will be turned to pasture, so that an adequate and stable fodder supply can be maintained for productive animals. It is expected that in 1980 there will be 4.3 - 4.5 million ha of rich irrigated pasture, assuring forage for 14 - 16 million cows.

There is an all embracing program for the production of mineral fertilizers and chemicals for plant and livestock protection. Towards 1980 the quantity of mineral fertilizers for agriculture should increase up to 115 million tons and chemical feeds up to an additional 5 million tons. Preference will be given to phosphorous fertilizer production, and to concentrated and complex fertilizers. The chemical quantities for plant protection must be increased up to 628 thousand tons in nutrient equivalent, (herbicides only - 245 thousand tons).

An improvement in agro-chemical service system, acid soil neutralization by $CaCO_3$ plastering and reclamation of alkaline soils, and the wider use of peat in the preparation of organic fertilizers are planned.

In order to further improve technical equipment and to expand industrial production methods, agriculture must be supplied with 1900 thousand new tractors, 1580 thousand tractor trailers, 106.5 thousand bulldozers, 538 thousand grain combines, 1350 thousand lorries, etc. The total value of these new agricultural techniques and the equipment is expected to amount to 23 milliard roubles, 10.3 milliard of which will be allocated for the supply of fodder production techniques or those directly serving animal husbandry.

Science has to play a more important role in the program for agricultural development in the USSR. Its task up until 1980 is to provide farms with new and highly productive varieties of agricultural crops and breeds of animals, paying greater attention to hybrids and cross-breeding, in order to work out more progressive techniques corresponding to the natural regional conditions.

Scientific research must also develop and suggest more effective methods for the economic management of agriculture at the different organizational levels.

During the current five-year plan, the food industry will increase its production by 23 - 25%. The volume of some food commodities - fish and fish products - should rise by 30 - 32%.

Definite encouragement will be given to the development of dietary foods, processed and semi-processed foods for children, and food concentrates.

Marked attention will be paid to the construction of cold storage facilities and refrigeration plants. Refrigeration capacity in the meat and milk processing industries will increase 1.3 times.

As a result of the improvement in the material and technical base in the production organization and in economic management, the per capita labor productivity in the food industry will have to increase 24 - 26%.

The main targets of Czechoslovakia's agrarian policy during the period 1976-1980 will be to increase production above the level achieved in the last few five-year periods. Agricultural production in this country will continue to further intensify and more effectively utilize the land, so that national self-sufficiency will be reached. Production of food, typical for conditions in the temperate zone must also reach the level of self-sufficiency.[9]

In comparison with the period 1971-1975, the gross agricultural production must increase 14 -15% in the period 1976-1980, and priority must be given to the development of cereals, which must increase by 16 - 17%.

The most important tasks in the field of plant-growing during the current five-year-plan are:

- the complex solution of the food problem, mainly with a view to fodder base requirements;
- fruit and vegetable production concentration in selected specialized enterprises;
- land regulation improvement and enlargement of agricultural units, etc.

In the field of animal husbandry, there are a number of important problems concerning specialization and concentration:

- production of milk and beef must follow a more optimal degree of specialization and concentration;
- there must be an improvement in the division into districts of breeds of horned cattle;
- the size of the production unit must be optimized and the use of industrial methods in production must be intensified.

A further expansion and concentration growth of production in pig-breeding and fattening will be carried out by connecting the latter to the meat processing industry. A wide program of

hybridization and the construction of new pig-fattening complexes will be carried out in accordance with the principle of the complete production cycle.

In the poultry-farming sub-branch, attention will be paid to the more effective use of the newly created breeds and the more effective direction of production process development towards the preparation of the finished product for the needs of the market. Stress will be placed on the question of reconstruction and modernization of the existing production capacities. Vertical production integration must be intensified. The application of new industrial methods will be expanded on the basis of new technological, organizational and economic achievements. A more efficient use of the available pasture and possibly the introduction of industrial methods and technology for sheep farming are anticipated.

Grain production development will be subordinated primarily to the needs of animal husbandry, which means that a more effective structure of sown areas must be created in the separate regions; and a maximum fodder crop yield must be secured. Towards the end of 1980 total grain production in the country, particularly fodder crop should be enlarged considerably. For this reason the average yields of grain must be increased by 4.1 - 4.2 tons/ha.

As well as increasing the quantities of grain fodder produced, this must be more rationally utilized. More successful solutions are being sought to the problems of finding the optimal proportion distribution between grain and other fodder crops, and of how to raise the nutritional value of the livestock fodder.

A further stabilization of fruit and vegetable production is envisaged, although the CSSR will continue to import fruit and vegetables in the future.

The basic target of animal husbandry in the years of the current five-year-plan is to increase production by about 13%, thereby satisfying domestic demand for animal products. With this aim in mind, the average milk yield per cow should be increased to 3000 - 3100 litres. In cattle-farming one kg of meat (in real weight) should be obtained from about 2 kg of grain; 1 litre of milk from 0.23 kg of nourishing grain; and 1 kg of pork (in real weight) from 3.5 kg of complex fodder compounds.

During the current five-year plan, the CSSR's agriculture will continue to develop and improve its material-technical base. Agriculture will be supplied with new more productive technology (machines and equipment) costing 27 milliard crowns. 49 thousand new tractors, over 10 thousand combine harvesters, a great number of machines for fodder gathering, and complex mechanization of production processes in the animal husbandry sector will be provided. 22 thousand lorries will be supplied for the needs of the agricultural food complex. The quantity of chemical fertilizers used per hectare is expected to reach 268 kg (in nutrient equivalent) towards 1980.

Great attention is to be paid to the agro-chemical centers as an important means of serving agricultural enterprises in plant-growing. Since 1976, the integrated system of laboratory services for studying fertilizers and plant protection is under joint management to provide the agricultural enterprises, research institutes and the state authorities with common information.

As a result of the growing mechanization in production processes and the decreasing manpower engaged in agriculture (100 thousand people are expected to leave agriculture over the current five-year period), towards 1980 there will be 8 hectares of land per agricultural worker, and their age and qualification structure will be improved.

Corresponding to the increasing requirements of the population and based on the growing demands for raw materials, further developments in the food industry are to be expected. Approximately 20 milliard crowns will be spent on the modernization of existing plants and the construction of new factories.

A characteristic element in the CSSR's agrarian policy in the current five-year-plan is the extension of integration between agriculture and the food industry. This will affect the scale of the production activities as well as the relations between production processing and trade, mainly in the most important agricultural branches, such as fruit, vegetable, and poultry-farming. The cooperation between different enterprises (including the relations between cooperative and state farms) for the purpose of carrying out joint projects (e.g. the establishment of joint processing enterprises, greenhouses, drying houses, etc.), is to be more widely applied. Agricultural services and some elements of the food industry and trade are included in this sphere of cooperation between different types of enterprises.

4.3. FORECASTS FOR FOOD AND AGRICULTURE DEVELOPMENT UP TO 1985-1990 AND 2000.

The main trends, growth rates and structural changes in the development of the national economy in all Community countries after 1980, and the factors influencing this development, have been revealed in the forecasts made during the last few years. These forecasts are a basis for elaborating future five-year plans in the individual countries and for planning economic integration within the Community framework.

Because of this, the 25th Session of the Council for Mutual Economic Assistance assigned a task to its executive offices to coordinate the elaboration of different forecasts; amongst these are included forecasts for the requirements, production and trade of the most important agricultural commodities, as well as for the decisive factors in future food and agriculture development.

In pursuing these goals, the Permanent Commission for Agriculture and the Food Industry organized the carrying-out of forecasts up to 1980 and 1990 for the requirements and production of and trade in the most important crops and products:

- wheat, corn-maize, rice and pulse crops;
- sunflower, sugarbeet, cotton and tobacco;
- potatoes and vegetables, including cucumbers and tomatoes;
- greenhouse-grown vegetables, including cucumbers and tomatoes;
- fruit, including apples and peaches;
- and grapes, etc.

From the animal product group, the forecasting has been carried out for:

- meat, including beef, pork, mutton and poultry;
- milk and dairy products;
- and eggs, etc.

For the same commodities, special programs for future specialization within the Community framework have been made. All these forecasts were carried out at the beginning of the 1970s. Some of them included the period up to 1985 or 1990, and in individual cases up to 2000. Almost all of these contain data for the predicted development up to 1980. However, at present these data are of no practical interest, because this period is included in the current five-year-plan of each country.

According to the forecasts, the percentage share of agricultural production in the gross national product of the Community countries will continue to decrease - from 14.2% (an average for the period 1967-1969) to 10.2% in 1980 and 7.8% in 1990. The most considerable changes are predicted in the countries where agriculture still holds a relatively high percentage share - Romania and Bulgaria. It is anticipated that in Romania this share will decrease - from 22.7% (an average for 1967-1969) to 14.3% in 1980, to 10.0% in 1990. In Bulgaria the percentage share of agriculture in the gross national product should decline - from 20.4% (average for 1967-1969) to 11.6% in 1980, and 7.5% in 1990.

The share of agricultural production in the gross national product in the USSR during these periods is expected to decrease correspondingly from 14.2% to 10.5%, and to 8.1%; in Poland - from 16.0% to 10.9%, and to 7.6%; and in Hungary - from 13.0% to 9.8%, and to 7.5%. This means that in the forecasted period up to 1990 the above-mentioned CMEA countries will try to reduce their

production share of agriculture, achieving higher development in the non-agricultural branches. This percentage share will continue to decrease even in the GDR and the CSSR, where it is low at present. In the GDR, this decrease is expected to be from 7.7% (an average for 1967-1969) to 5.2% in 1980, and to 3.6% in 1990. In the CSSR - correspondingly from 9.1% to 5.4%, and to 3.3%.

Regarding average annual rates of increase in agricultural production within the Community, according to the forecasts they are expected to be 2.7% in the decade 1971-1980, and 2.3% in the decade 1981-1990. The agriculture of the USSR is expected to develop the most rapidly - at an average of 3.4% for the first decade and 3.1% for the second decade. Romanian agriculture is also expected to develop rapidly - 3.0% in the first decade, and 2.8% in the second decade. The predicted average annual rates of growth in the remaining countries are correspondingly: 2.3% and 2.0% in Hungary; 2.0% and and 2.0% in the CSSR; 1.9% and 1.6% in Poland; 1.8% and 1.4% in Bulgaria; and 1.0% and 0.9% in the GDR.

Despite the present differences in the consumption of main agricultural and food products between the CMEA countries, it is anticipated that some common tendencies will become evident during the period up to 1990. [13,17,23,25,39,41,48,52,64,71,75,76,78]

The forecast envisages:

- a per capita consumption decrease in cereal crops and potatoes;
- a retention of the present level and in some countries a holding back in the consumption of sugar;
- a holding back (or insignificant positive or negative changes) in the consumption of fat, encouraging the consumption of vegetable oil;
- and an increase in the consumption and an improvement in the structure of meat and meat products, milk and milk products, and eggs, fruit and vegetables.

A very large increase is envisaged for some kinds of livestock production. Thus, for example, in comparison with 1970 (for all CMEA countries) the quantity of eggs is expected to increase by 111.8%, milk by 77.5%, and meat by 55.5%.

The forecast envisages a considerable growth in the production of basic fruit and vegetables, and dessert grapes,in order to completely satisfy domestic demand.

Aiming to create more realistic forecasts for the development of food and agriculture and in particular to explain the role played by the basic factors determining this development, horizontal forecasting was carried out. In 1973-1975 with the

joint efforts of the research institutes and the state authorities of the Community countries, a general forecast for the development of production processes, mechanization, electrification and automatization in plant-growing and animal husbandry up to the years 1990 and 2000 was worked out.

This forecast envisaged a further reduction in active labor engaged in agricultural production, a considerable increase in machinery and equipment used in agriculture, complex mechanization of production processes in plant-growing and the maximum mechanization possible in the individual animal husbandry sub-branches.

It is considered that future agricultural production mechanization in all countries, based on the new production conditions in the constantly consolidating enterprises and branches, will be developing through raising the average horsepower of tractor engines. Up to 1990 speeds will have to reach 9 - 15 km/hr, with even higher speeds after the year 2000. It is anticipated that the gathering capacities of grain combines will reach 10 - 15 and up to 20 kg of grain per second. Productivity of the potato gathering automative machines should increase by 30 - 60 tons per hour.

Structural changes in the type of power used in agriculture are envisaged by increasing the share of electric power. Development of agricultural technology during the next two decades should ensure a considerably wider application of mechanization and the use of more complex attachments for the more powerful tractors. The production and use of specialized transport technology will be expanded. Great attention will be paid to construction and machine and equipment for complex mechanization of all production processes and particularly for fodder-crop gathering. Engine-powered gathering machines will become the standard type used in agriculture.

As well as considering the purely technical questions, forecasts deal with important problems such as the future development of production techniques and the utilization of agricultural technology, the perspectives for research and development in the sphere of agricultural machine-building, the trends of future mechanization of agricultural production, etc.

At the beginning of the 1960s the CMEA countries worked out a standard system of machines for the mechanization of agriculture. After several years this system was extended, and at the beginning of the 1970s improved. The latest model in this system for the complete mechanization of agriculture and forestry includes over 1750 types of machines: tractors, and attachments for the complete mechanization of production processes, freight-unloading equipment, transport and machines for other processes and operations in plant-growing, animal husbandry and forestry. The construction and production of such technology is guaranteed, because of the implementation of Community specialization and cooperation.

Up to 1980 the number of tractors and other agricultural machines produced by common specialization and concentration should reach 162 types. Attention has been paid to the development of machinery and equipment for complex mechanization of production processes and operations in grain production, fodder production, vegetable and fruit production, and for land reclamation.

The future prospects for mechanization, electrification and automation in the animal husbandry sub-branches are based on the principle of further consolidation of production units and the application of industrial methods throughout the entire livestock sector.

Dairy farms milking up to 2000 cows have to be constructed to optimize production. Horned cattle farms for beef production should hold from 30-40,000 and up to 80 thousand head. The use of production lines with a considerable degree of automation and program control of production operations and processes for some types of farms and especially for horned cattle farming is anticipated.

Production lines with separate elements of automation in horned cattle farming and fattening are expected to be created and introduced widely in practice as early as 1980. In the period between 1980 and 1990, production lines with program control for execution of separate operations are expected to be introduced. At the end of the period (towards 2000), production lines with program control of a group of production operations and complete production processes will also be introduced.

Production process mechanization and automation in pig-farming, and particularly in pig-fattening, will be developed within the framework of concentration already achieved, 40 up to 100 thousand head in pig complex. The expansion of construction and the application of complex mechanization and automation through the use of production experience is anticipated in this sector.

Industrial poultry-farming for eggs and broiler chickens will be developed in a similar way. Considering the advances already achieved internationally in the concentration of this production and the application of industrial methods, the European CMEA countries stress:

- the construction of modern consolidated poultry farms with an optimal structure;

- an improvement in their location;

- the construction of new highly-productive technology;

- the development of more effective fodder compounds, raising not only the economic results but also the nutritional value of the poultry products, etc.

New factories will be built in isolated areas away from contact with other industry in order to create the necessary hygenic conditions for the animals. When such natural conditions are not available, they will be created through the planting of forest massifs and shelter belts, the construction of new water basins, and other natural improvement schemes.

The predictions for the future development of industrial livestock farming foresees the construction of new agricultural community settlements, including housing, shops, etc. Production questions in these enterprises will be solved together with other related problems - technical, technological, economic, social, etc.

The problem of future mechanization of agricultural production are considered alongside the development of other branches of production and above all with the development of machine-building, instrument-building, and the building of new means of automation. At the same time their solution is bound to the development of the chemical industry, microbiology, genetics, selection and development and the science of land economy.

The agricultural research and development activities must solve the existing problems of mechanization, electrification, and automation of production processes in plant-growing and animal husbandry for the complete transition of production in these branches to an industrial base during the period up to 1990 and to 2000.

To ensure the necessary material and technical future for further agricultural production development till 1985, the forecast anticipates a doubling and in some cases a trebling of capital investment in this branch. Energy needs in USSR agriculture in 1985 are expected to become 3 times greater than in 1970; in Bulgaria, Hungary and Poland - demand is expected to approximately double during the same period; and in the GDR to increase over 1.5 times. The quantity of mineral fertilizers and pesticides for plant protection is anticipated to increase about 3.5 times for all countries, although this increase at present varies noticeably for each country, because of the different degrees of chemical application. The volume of nitrogenous fertilizers (in N_2equivalent) in the whole Community is expected to increase 147% in 1980, and 193% in 1985, in comparison with 1970. The volume of potash fertilizers (in K_2O equivalent) will increase respectively 125.7% and 201.5%.

Considerable effort has been made during the last few years to extend the areas of land reclamation and to solve its related research and development problems. For this reason, by 1985 the irrigated areas of all CMEA countries (Mongolia and Cuba included) should be extended 1.5 times in comparison with 1975, and the drained areas approximately two times.

The extension of these land reclamation areas will be accompanied by an accelerated implementation of technical progress in new projects

for stationary and semi-stationary sprinking systems, and automated irrigation plants, etc.

A special forecast has been approved for the development of agricultural science. This indicates the leading trends up to 2000, with the use of scientific and technical progress to achieve future increases in agricultural and food products and for the improvement of economic results. These achievements will be affected by raising the production efficiency in agriculture and the food industry.

As well as the forecasts for food and agricultural development in the Community as a whole, individual national forecasts have been carried out. On the one hand these forecasts show this development in a more detailed form as an integral part of the national economy. On the other hand they stress the priority given to some very important problems of this development in the individual countries.[7]

The forecast carried out for the development of Romanian agriculture towards 1990 envisages annual consumption of meat reaching 65 kg per capita, that of grain (in flour equivalent) 130 kg, milk - 300 litres, butter and fat from animal origin - 7 kg, vegetable oils - 12 kg, eggs - 250, vegetables - 200 kg, and fruit 200 kg.

A high quality supply of raw materials for the food industry and for light industry is also planned. An increase in Romania's food and agricultural exports to the international market is envisaged.

Total production of cereals is expected to reach 29 million tons, including 5.5 million tons of wheat and 21 million tons of maize. In the same year production should reach 1.4 million tons of soyabeans, 1.4 million tons of sunflowers, over 11 million tons of sugarbeet, about 4.6 thousand tons of early and summer potatoes, and 5.2 thousand tons of vegetables, etc.

The number of horned cattle towards the end of the projected period is expected to reach 9.5 million, including 4.8 million cows and young cows (heifers). The number of sheep and pigs will reach 19 mill each. As a result, towards the end of the period production is expected to reach: 1.2 million tons of beef, 360 thousand tons of mutton, 1.96 million tons of pork, 460 thousand tons of poultry meat, 16 billion litres of milk, etc.

The forecast for future agricultural mechanization in this country is based on the assumption that up to 1990 the population actively engaged in agriculture will decrease to 10 - 15% of the total working population, in comparison with 46% in 1970. An increase of gross agricultural production up to 2 - 3 times is also expected during this period.

The agricultural machine-building industry (particularly tractor construction) will play a decisive role in the removal of active labor from the agricultural sector.

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[7] Forecasts for all CMEA countries have not been mentioned due to lack of published material.

It is anticipated that during the next 10 - 15 years agricultural mechanization in Romania will be developed in the following directions:

- a diversification and further specialization in tractor production by increasing the average horsepower of tractor engines;

- an increase in the capacity of agricultural machinery, by the use of larger attachments, by increasing the machine speed, and supplying more complex attachments which are able to carry out a greater variety of tasks;

- and the extensive use of self-propelled chassis, of aircraft for agricultural purposes, etc.

In 1990 it is estimated that 200,000 tractors will be in use in Romanian agriculture. The volume of mineral fertilizers employed will reach 3.1 million tons and irrigation areas will extend over 3.5 to 3.7 million hectares. The forecast for 1990 envisages the rise to 138 Kw of power per 100 hectares of land (1 Kw = 1.36 h.p.) The average horsepower of one tractor will increase to 93.5 Kw. For plowing, tilling and levelling the land, the average speed will reach 9 - 12 km per hour. It will increase up to 12 -15 km per hour for distributing pesticides and fertilizers, and 25 -30 km per hour for internal agricultural transport operations. Greater mechanization is expected in the harvesting process, particularly for straw gathering, maize stalk gathering, sugarbeet collecting, etc.

Electric power should be applied more extensively for irrigation and for some animal husbandry processes.

A forecast for agricultural development in Poland up to 1985 has been worked out. It assumes (in these calculations) that the annual per capita consumption of meat will reach 70 kg, milk - 560 litres, eggs - 14 kg, and fish - about 7 kg. Meat consumption must be regulated in such a way that pork will constitute 45% of the total, beef - 22%, veal - 13%, mutton - 9%, and the other kinds of meat, i.e. poultry, game, etc. - 11%.

The forecast anticipates a rapid growth in the number of horned cattle (157% in 1985 against 100% in 1965) and a more moderate growth rate for the number of pigs (127% against 100%), so that the above-mentioned consumption levels would be guaranteed without decreasing the export of meat.

The annual number of pigs in the country should reach 17.5 million towards 1985, horned cattle - 15.5 million, calves - 8 million; sheep - 5.4 million. Production of pork in butchery weight must reach 1860 thousand tons (including 300 thousand tons of pork fat); beef - 955 thousand tons, veal - 75 thousand tons, and mutton - 55 thousand tons.

As a result of projected changes, towards 1985 the number of pigs per 100 hectares must increase to 88.4 against 61.8 in 1960 and 69.1 in 1965. The number of horned cattle has to increase correspondingly to 78.6 against 49.9, and the number of sheep - 27.4 against 15.3 in 1965.

Production of beef and veal per capita of livestock is expected to increase from 43.6 kg in 1965 to 66.5 kg in 1985, and of pork (without fat) correspondingly from 78.7 kg to 89.1 kg.

During the last couple of years (1976-1977) in Poland the forecast for agricultural development up to 2000 has been made. This forecast estimates that the country's population will reach 37 - 40 million people. Further agricultural concentration is expected, which will result in a decrease in the number of agricultural enterprises to less than 1 million. Greater mechanization, a higher level of chemicalization, the introduction of high-yield varieties of crops, and more productive animal breeds are expected. Average crop yields should increase 50% and animal productivity 60% above the 1970 level.

Considerable changes are expected in the population's dietary habits. The percentage share of processed foods will increase, and that of fresh food will decrease.

The great land area of the USSR, the regional differences in the natural and economic conditions for the development of agriculture, as well as for the great variations in the average data of the individual republics, all these are serious obstacles for the carrying-out of useful long-term forecasts or programs for the development of agriculture in the whole country. This is why this country usually establishes long-term programs for the development of basic trends and solutions to the most important problems of agriculture, and the industrial sub-branches connected with it. The same is true for the complex program for agricultural development in separate republics or zones which are of great importance to their economies.

It is worth mentioning here the "Program for further development of the non-black-soil zone of the RSFSR", which is of importance not only for the RSFSR, but for the whole of the USSR, (for this region contains 1/4 of the total population of the state). It is expected that the production of the most important agricultural products will be enlarged 2 - 2.5 times up until 1990. Meat production will reach 2.9 million tons, milk - 23 million tons, eggs - 15 - 16 billion.

It is forecast that up until 1990 about 9 to 10 billion ha in this Soviet Republic will be drained and 2.5 million hectares will be irrigated. Another area of several million hectares will be the object for soil cultivation. The planned land reclamation schemes in the USSR will function on a modern technical level, using local and imported science and technology. In this respect, the research and development institutes in the state are creating new techniques for the construction and operation of irrigation systems. There is a large import of techniques, expertise and technology from the western states. A number of improvements

will be carried out along the rivers Dnepre, South Bug and the Danube. In Moldavia, the Kazakchstan,and the Kirghiz, SSR. The construction of the Great Stavropolski Channel, the Pravo-Egorlikovsk, the Kraznodarsk and other irrigation systems will be continued.

The purpose is to ensure irrigated land for cereal crops and in particular cereal forage cultivation. The crop output of these lands is to be about 75-80 million tons by 1990. Working on the assumption that demand for crops will not increase, the program aims to assure the provision of 75-80% of the necessary irrigated land, i.e. excluding the effect of droughts.

Programs like these are also being approved for the other Soviet republics, which have to specialize their agricultural production to correspond to their natural economic conditions, and to the problems which have to be solved by the country as a whole.

At the beginning of the 1970s in Czechoslovakia forecasts for food and agriculture development up to 1990 and later (1974-1975) up to 2000 have been made. This country is one of the Community members which has had the greatest experience in economic forecasting. Owing to this, their forecasts are characterized not only by very clearly defined targets, but also by very precisely formulated criteria for this development.

The forecasts for food and agriculture development up to 1990 and 2000 contain two basic groups of criteria - material and economic. The principle material criteria are:

- to ensure the optimal level of nutrition for the population;
- to ensure the production growth keeps pace with the increasing food requirements of the population;
- to attain a higher level of national self-sufficiency in food and agricultural commodities.

The principal economic criteria are:

- to decrease production expenditure and retail prices of food and agricultural commodities;
- to accelerate labor productivity in the agricultural sub-branches in order to release manpower for use in other non-agricultural sectors;
- to adapt the national agricultural production more sucessfully to the international market situation, in order to improve the efficiency of national exports and imports in agricultural and food commodities, etc.

According to these criteria it is expected that in 1990:

- annual per capita cereal consumption will decrease by 30% in comparison with 1970 level;
- the country will achieve self-sufficiency in basic animal products, with the exception of beef;
- mainly as a result of increased yields, cereal production will rise and the forage base will be improved.

Irrigation areas need to be extended to 200,000 hectares, which constitutes 7% of the total plowed area. The amount of mineral fertilizers (in nutrient equivalent) used will reach 347 kg per hectare. Approximately 900,000 hectares of marshland have to be drained.

Average yields of cereals in irrigated areas have to increase 54.6% reaching: wheat - 5.7 - 6.2 cwt, barley - 4.8 - 5.4 cwt, corn-maize 8.0 - 8.8 cwt per hectare.

Average milk yields per cow should increase from 2470 litres in 1970 to 3415 litres in 1990. The slaughtered weight of horned cattle - from 493 - 520 kg; number of eggs per hen - from 178 to 258, etc.

By the year 2000 the percentage share of agricultural production in the national economy should decrease sharply. It will be about 3% of the national income in comparison with 9.5% in the mid 1970s. The percentage share of labor actively engaged in agriculture will decrease to 5% in comparison with 16% of the total active population.

The main trends in plant-growing will indicate considerable changes in arable land use. It is expected that:

- land used for cereal crops cultivation will be increased to constitute up to 60% of total sown areas;
- oil-seed crop areas will be doubled;
- the further increase in sugarbeet areas is expected;
- vegetable cultivation areas should be almost doubled;
- and potato cultivation areas should be decreased up to 50%.

Considerable changes are anticipated in the number of productive animals. In the year 2000 the CSSR should increase the number of animals per unit of arable land by 25% above the present number. The number of broiler chickens should rise 33%. The increase in head of horned cattle (mainly cows) will grow more slowly. Pig numbers should increase, but laying hen numbers should decline.

CONCLUSIONS

The most important conclusions of the food and agriculture development in the European CMEA countries during the 1961-1975 period and the general trends up to 1980 are:

1. Contemporary agriculture development in most of the Community countries (except Poland) has been realized through large cooperative and state farms possessing considerable production funds - fixed capital, land, technology, productive and working animals. During this 15 year period the policy of further production concentration has been carried through, and the equalization between agricultural and industrial labor conditions has taken place. The process of amalgamation still continues. In the individual countries, however, these processes appear in different forms - from the simple cooperation of individual farms in Poland, to the cooperation and creation of joint enterprises in the GDR, the CSSR, and the USSR, to the organic horizontal and vertical integration in the agro-industrial and industrial-agrarian complexes in Bulgaria.

2. As a result of more rapid industrial development, the percentage share of agriculture in the whole national economy has decreased, but the absolute volume of food and agricultural production has increased. Therefore, the volume of agricultural and food commodities sold on the national and international market has also increased.

   The quantities of food and agricultural goods consumed by the population in the different countries in many cases have increased and have reached the optimal nutritional level.

3. Agricultural management has been more closely interwoven with industry, construction, transport, public health services, etc., and its problems have therefore to be solved on a regional basis. The successful solution of these problems will require more intense efforts to find and experiment with new management forms by using contemporary computer techniques, programs and models.

4. Production intensification is and will be the main line of development in agriculture. The further optimization of mechanization, chemicalization and land reclamation, and the introduction of new varieties of plants and breeds of animals, and increased production and improved quality are the most important factors in contributing to development in agriculture.

   All the organizational/economic factors and the improved age and professional structure of labor engaged in agriculture play an important role in this development.

Concerning the specific national conditions during the current five-year plan, 1976-1980, the individual countries give different priority to these factors:

- the USSR and Bulgaria place primary importance on chemicalization and land reclamation;
- the GDR - on chemicalization and mechanization;
- Poland and the CSSR - on mechanization and chemicalization;
- and Romania - on organizational and economic factors, etc.

5. The agrarian policy in all countries in the field of economic organization is characterized by some common features:

- the further amalgamation of production units and enterprises;
- intensive production specialization;
- maximum use of the contemporary scientific and technical achievements and national and international expertise;
- the extension and implementation of material incentives, honorary awards, and the new economic system of management and planning.

However, the agrarian policies in the individual countries show some variations, depending on the achieved levels and tasks which they have to solve at present:

- the USSR and Bulgaria have very high levels of concentration highly-developed production specialization;
- the GDR and Hungary have developed intensive specialization on the basis of inter-enterprise cooperation;
- the CSSR has strongly developed horizontal distribution of the main agricultural crops and animals.

6. By also applying the principle of international labor distribution to the field of food and agriculture, the Community countries have solved the food supply problem mainly by the achievement of greater self-sufficiency in food production. They also use the channels of international trade between socialist and non-socialist countries. These channels have been used for supplying agriculture with the necessary machinery, equipment, chemicals, seed and planting materials and highly-productive animals. In the last few years, the aim for self-sufficiency in such goods, which in the individual countries had not been achieved in the past, but for which favourable natural and economic conditions exist, has been given greater priority:

- Romania, Bulgaria and Hungary have tried to reach a higher level of machinery and chemical production;

- the GDR, the CSSR and Poland have adopted programs for self-sufficiency with respect to some important agricultural products - mainly corn and vegetables;

- the USSR with its vast industrial and agricultural resources follows the line of almost complete self-sufficiency in all main food and agricultural goods, and industrial commodities connected with agriculture and the food industry.

7. The European CMEA countries have used a common approach for the social reconstruction of agriculture - the Lenin cooperative plan - creating large cooperative and state farms. The forms and level of socialization and the proportion between the cooperative and state sectors, however, have been varied in the individual countries, because of their different social and economic conditions:

- in the USSR, the country with the greatest expertise and the longest traditions in the management of the socialist economy, the socialist forms of ownership are dominant - at present mainly the state form;

- in Bulgaria, the socialist production forms are entirely dominant, and in the last few years the state and cooperative farms have been closely interwoven in the agro-industrial and industrial-agrarian complexes;

- in the GDR and the CSSR the prevalent socialist form of ownership is the cooperative farm;

- in Hungary the cooperative farms hold the greatest areas of land, the largest number of animals and volume of production. However the state farms play a leading role in creating modern organizational and management forms, producing high-quality seeds and highly-productive breeds of animals, and also by the application of scientific and technical achievements.

8. During the current five-year-plan (1976-1980) the agrarian policy in all these countries has been characterized by the following trends:

- an increased interest in all countries in the application of contemporary scientific-technical achievements and the most progressive national and international expertise;

- increased capital investment in the agriculture and food industry, particularly in the USSR, the GDR, and the CSSR;

- increased attention to perfecting the forms of production management at the individual enterprise level, the regional and the national level, most significantly in Bulgaria and the USSR;

- the extension of the role of financial incentives and an improvement in the price system clearly expressed in Hungary and the CSSR;

- an extension of the function of domestic and international trade, in order to improve the supply of agriculture with industrial commodities on the one hand, and to market the food and agricultural commodities on the other, has taken place in all of the countries.

9. The realization of food and agricultural development aims in the CMEA countries during this period and the achievement of the planned volume of food and agricultural goods, especially the main food and agricultural commodities, will shortly be of considerable influence, and they will reflect Community participation in the international agrarian market and in the solution of global food problems. The available data in this field and the assessment of the results of the implemented agrarian policy indicate that these countries in the near future will be able to:

- decrease their dependency on the international market by reducing imports of corn-cereals;

- increase the volume of exported agricultural commodities - mainly corn, fresh and processed vegetables and fruit;

- raise exports of milk products, poultry, pork, mutton, lamb and beef;

- change the export structure of agricultural commodities considerably by increasing the share of processed foods - frozen, dried and tinned vegetables, fruit, and juice, tinned meat-vegetable products, tinned meat, etc;

- continue exporting high-quality planting materials, breeds of animals, technology, techniques, fertilizers and pesticides;

- import modern technology and techniques, planting materials and breeds of animals, etc.

The international food and agricultural trade policy of CMEA countries and the other related transport, construction, technology, etc. policies will obviously remain open to all socialist and non-socialist countries, giving priority to industrial cooperation.

10. The forecasts play an important role in planning targets for the centrally planned economies. Because of this the

individual countries and the Community Council use them to define the most significant trends for future food and agricultural development. The existing forecasts indicate:

- the further improvement and enlargement of the socialist (state and cooperative) production forms in food and agriculture;

- the extension of production specialization and horizontal and vertical integration, through the amalgamation of the individual enterprises and production units, through the establishment of joint enterprises, and through the creation of agro-industrial complexes or industrial-agrarian complexes;

- the gradual intensification of the agricultural production processes and modernization of the food industry;

- the extension of international labor distribution in the field of food and agriculture in the Community framework, and a more active participation in international trade.

The strategic targets for food and agriculture development in the CMEA countries up to 1985, 1990 and 2000 are:

- the gradual move towards equalization between agricultural labor conditions and those in industry;

- the improvement of rural living conditions to match those of urban areas;

- the achievement of Community and national self-sufficiency in basic food and agricultural products in order to cover recommended dietary requirements.

- and the guarantee of agricultural and food reserves for more active participation in international trade, contributing to the solution of the world food problem.

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