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East Europe Report

ECONOMIC AND INDUSTRIAL AFFAIRS

(FOUO 1/81)

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CZECHOSLOVAKIA

SSR TRENDS IN CATTLE PRODUCTION

Bratislava EKONOMIKA POLNOHOSPODARSTVA in Slovak Nov 80 pp 516-519

[Article by Engr. Jozef Judtova of the Ministry of Agriculture and Food of the SSR: "Beef Cattle Production in Slovakia"]

[Text] During the Fifth Five-Year Plan, gross production of livestock products rose by about 2.5 percent per year, and during the Sixth Five-Year Plan, we expect it to increase 2.4 percent per year. In spite of this over-all favorable development, nevertheless, we did not achieve the planned goals for the development of beef cattle. Cattle raising is one of the most important branches of livestock production, and is rightfully considered to be the focal point of agricultural production. Beef and veal, along with milk, are an important source of nutrition for the populace. Their production requires the use of a certain share of domestic sources of fodder that other domestic animals can use to a limited extent only. Cattle raising is linked to the soil, in which case, there is a reciprocal connection--the dependence of the fertility of the soil on the intensity of cattle raising.

In order to provide for the alimentation of the populace, it is necessary to increase the production of beef cattle at a faster rate, with the existing sources of the feed and fodder base, and in this way, to solve the requirement for raising the production of meat with a lower consumption of grain feeds. These goals were spelled out by the Sixth Five-Year Plan, which asks for an increase of beef cattle production in Slovakia during the Sixth Five-Year Plan of 8.9 percent as against the average Fifth Five-Year Plan level.

The tasks of the Sixth Five-Year Plan for the production of beef cattle are not being fulfilled. According to the anticipated fulfillment, the average annual output of beef cattle including an increase in cattle herds will be only 2.9 percent higher as compared with the Fifth Five-Year Plan average, and the average annual procurement of cattle for state stocks is expected to be on the Fifth Five-Year Plan level. Relatively good results have been achieved in increasing the production of milk for state stocks.

The situation in beef cattle production also influences the work for the preparation of the Seventh Five-Year Plan, and requires workers at all stages of management to analyze the causes for the non-fulfillment of the plan targets in beef cattle production during the Sixth Five-Year Plan, and to work out and implement

measures for a substantial increase in the production of beef cattle during the Seventh Five-Year Plan.

We are citing the development of certain indicators dependent upon the cattle production in Slovakia during the 5th and 6th five-year plan periods in tables 1 and 2.

A more comprehensive survey of the results for the Fifth Five-Year Plan and the expected results of the Sixth Five-Year Plan are given in Table 3.

Table 1

Indicators	Years 1971	1972	1973	1974	1975
Total cattle herds as of 1 Jan. (1,000 head)	1330.1	1343.9	1372.3	1390.4	1378.4
of this, cows	578.4	579.5	582.3	591	589,7
free grazing heifers	87,5	95.4	112.3	123	124,3
percent of herd					
cows	15,1	16.5	19.3	20.8	21,1
fattening cattle	210.9	216.1	221,5	209.9	200.5
Procurement for state stocks					
Total beef cattle (1,000 tons)	163.6	167.4	179.4	184.3	187,6
of this number, cows	44,2	48.7	52,6	63,1	65.8
other cattle	119.4	118.7	126.8	121.2	121.8
Beef cattle (1,000 tons)	356.5	354.9	377.1	386.7	398
of this number, cows	91.1	98.1	104.8	122.1	127.8
other cattle	265.4	256.8	272.3	264.6	270.2
Slaughter value of cattle (kg)	459	472	476	477	471
of this number, cows	485	496	502	517	515
other cattle	450	462	466	458	451
Milk (million liters)					
Output	1479.6	1527.3	1581.2	1587.5	1564.1
Procurement for state stocks	964,1	1040.4	1118,9	1154.8	1177,3

Table 2

Indicators	Years 1976	1977	1978	1979	1980
Total cattle herds as of 1 January (1,000 head)	1349,6	1386,4	1421,7	1450,7	1485,8
of this number, cows	580	577,8	577,8	582	584,4
free grazing heifers	128	129,2	145,1	148,2	155,1
percent of herd					
cows	22,1	22,4	25,1	25,5	26,5
fattening cattle	184,2	194,8	201,9	201,1	207
Procurement of beef cattle for state stocks					
Total beef cattle (1,000 tons)	169,1	170,6	177,6	180,5	
of this number, cows	63,2	65,1	68,5	68,6	
other cattle	105,9	105,5	109.1	111,9	
Beef cattle, total (1,000 tons)	361,7	364,6	377,3	386,5	
of this number, cows	122.5	126	133	135,5	
other cattle	239,2	238,6	244,3	251	
Slaughter value of cattle (kg)	467	468	471	467	
of this number, cows (kg)	516	517	515	506	
other cattle (kg)	443	442	447	446	
Milk (million liters)					
Output	1543	1584	1621.3	1666,8	
Procurement for state stocks	1210,5	1262,6	1315,9	1374,4	

From the aforenoted data, it is shown that during the Sixth Five-Year Plan, the orientation of cattle raising has grown in favor of an increase in production intensity, especially, the marketing of milk, and the intensity of beef cattle production per head of cattle has dropped, at the same time.

The orientation of market production of milk toward a rise was supported also by the development of cow herds, and this was by decreasing the herds in the private sector, where there is a low marketability of production, and by increasing them in the socialized sector, where there is a high share of market production of milk (Table 4).

The orientation toward an increase in the market production of milk took place as follows:

--Through increasing the procurement of milk for state stocks, with an expected average annual growth by 3.8 percent during the Sixth Five-Year Plan (estimate of the 5-year plan averages);

--By increasing the herds of free grazing heifers. The number of free grazing heifers as of 1 January on the average for the Sixth Five-Year Plan is more than 40 percent higher as compared with the average of the Fifth Five-Year Plan, in which case, their share of cow herds has increased substantially.

--By increasing the selecting out of cows. During the Fifth Five-Year Plan, as of 1 January, an average of 18.6 percent of the herds of cows were sold off to the state stocks for slaughter purposes, and in the Sixth Five-Year Plan, 22.5 percent is expected.

The planned rise in the production of beef cattle was not attained.

--In the Sixth Five-Year Plan, the average annual procurement of beef cattle is expected to be at the Fifth-Five Year Plan level.

--The herds of cattle under fattening as of 1 January have decreased in their annual average of the Sixth Five-Year Plan by 6.6 percent as compared with the Fifth Five-Year Plan, in which case, their share of the total cattle herds was lowered.

--The structure of procurement of beef cattle has changed, and it is expected that the proportion of slaughter cows will increase from 31.1 percent in the Fifth Five-Year Plan to 36.9 percent average for the Sixth Five-Year Plan, with a decrease in the proportion of other beef cattle.

--The drawing of cattle from the cattle herds for procurement for state stocks has dropped on the whole. During the Fifth Five-Year Plan, as of 1 January, an average of 27.48 percent was sold from the herds for the state stocks, and during the Sixth Five-Year Plan, 26.58 percent is expected to be sold. In particular, the selling of the so-called other cattle to state stocks has been lowered (fattening and other categories without cows). In all, during the Fifth Five-Year Plan, 19.50 head of other cattle per 100 head of cattle were sold to the state stocks, and in the Sixth Five-Year Plan, this number is 17.37 head.

--The average slaughter value of cattle has dropped in general, and this means the slaughter value of the other cattle with an increase in the slaughter value of cows.

The intensity of beef cattle production and cattle in toto has decreased relative to cattle herds as a whole, with a slight increase of intensity in regard to the cow herds.

The average daily weight gain in fattening cattle has become lower.

On the whole, therefore, a certain increase was attained in the production of cattle, especially the increase in herds; however, the desired increase in intensity of using production capacities in the production of meat was not attained.

As is known, for the development cattle raising, it is important to provide sufficient high-quality bulk fodders. The development of the production of bulk fodder in Slovakia is given in Table 5.

Table 3

Indicators	Average annual: Actual in Fifth 5-yr Plan	Average annual: Expected in Sixth 5-yr Plan	Index of annual averages
Cattle herds, total 1 Jan (1,000 head)	1363,2	1418,8	104,1
of this number, cows (1,000 head)	584,2	580,4	99,3
free-grazing heifers	106.5	155,1	142,9
their share of cow herds (%)	18,6	24,3	—
fattening cattle (1,000 head)	211,8	197,8	93,4
proportion of fattening animals of the entire cattle herds (%)	15,5	13.9	—
Procurement of beef cattle (1,000 head)	176,5	176,5	100
of this number, cows (1,000 head)	54,9	66,9	121.9
other cattle (1,000 head)	121,6	109,6	90,1
Procurement of beef cattle (1,000 head)	374,6	377,1	100,7
of this number, cows (1,000 head)	108,8	130,6	120
other cattle (1,000 head)	265.8	246,5	92,7
Slaughter value (kg)	471,1	468	99,3
of this number, cows (kg)	504,6	512,2	101,5
other cattle	457,5	444,6	97,2
Average daily weight gain during fattening of cattle (kg)	0,83	0,78	94
Output of cattle including increase of heards (1,000 tons)	177,6	182,7	102,9
Per head of cattle			
procurement of beef cattle (kg)	129,5	124,4	96.1
output of cattle (kg)	130,3	128,8	98,8
Per cow			
producement of beef cattle (kg)	302,1	304.1	100.7
output of cattle (kg)	304,0	314,5	103.5
Production of milk (million liters)	1547,9	1621	104,7
Procurement of milk for state stocks (million liters)	1091,1	1314,7	120,5

Table 4

Indicator as of 1 January	Annual Average: Actual during the Fifth 5-yr Plan	Annual Average: Expected during the Sixth 5-yr Plan	Index of annual averages
Cow herds in the social. sect. (1,000 head)	416.4	500.5	120.2
Cow herds in priv. sector (1,000 head)	167.8	79,9	47,6

Table 5

Indicator	Unit of measurement	Annual average: Actual in Fifth 5-yr Plan	Annual average: Expe. Actual in 1976-1979	Index of annual averages
Hay from perennial fodder crops				
harvest	(1,000 t)	1532,4	1332.7	87
area	(1.000 ha)	279,1	202.5	72,6
yield	($t.ha^{-1}$)	5,49	6,61	120.4
Hay from meadows				
harvest	(1,000 t)	867.4	852	98,2
area	(1,000 ha)	304,3	272.2	89,5
yield	($t.ha^{-1}$)	2,85	3,13	109,8
Hay frcm pasture lands				
harvest	(1,000 t)	729,6	806.1	110,5
area	(1,000 ha)	503	536,5	106,7
yield	($t.ha^{-1}$)	1,45	1,5	103,5
Annual fodders				
harvest	(1,000 t)	4412.2	5252	119
area	(1,000 ha	196.3	223,6	113.9
yield	($t.ha^{-1}$)	22,48	23.49	104,5
Fodders in terms of hay, total	(1,000 t)	3906,2	3928,7	100,6

The average annual production of bulk fodder in terms of hay was only 0.6 percent higher during the Sixth Five-Year Plan (during the years of 1976-1979) as compared with the annual average of the Fifth Five-Year Plan. With a decrease in area sown to fodder crops on cultivated land (more than 10 percent all told), and with a change in structure of perennial grasses for the promotion of pasturing, and with the increase in yield per hectare, consequently, during the years 1967-1979, a slightly higher annual harvest of fodders in terms of hay was obtained as compared to the Fifth Five-Year Plan. The share of hay was lowered in structure of perennial fodders and hay from meadows, and the share of annual fodders and pasture crops was increased. Because hay from pasture lands, except in isolated cases, is not a source for the fodder stocks for the winter season [sentence as published]. Therefore, the sources for the production of winter feed will decrease to a certain extent. In this case, the needed level of quality is not being achieved for stored fodders. All of this has affected the level of consumption of grain feeds, which is higher than the balance standards.

From the aforenoted, it is seen that in the production of bulk fodder, the necessary prerequisites for increasing meat production intensity could not be created.

The situation in the production of grain feeds made it necessary to take economization measures in the consumption of grain feeds, which were realized mainly in the raising of cattle for meat production.

At the current time, work on the preparation of the Seventh Five-Year Plan is in full swing. In addition to the increase in output and market production of milk, it is required to provide for a relatively high rate of growth of procurement of slaughter beef cattle as well. The economic means prepared for the Seventh Five-Year Plan are also supporting this orientation.

The guidelines for the preparation of the Seventh Five-Year Plan in Slovakia hinge on an increase during the Seventh Five-Year Plan of an average annual procurement of milk for state stocks of 17.9 percent, as compared with the expected average of the Sixth Five-Year Plan, and an average annual procurement of beef cattle for state stocks of 12.7 percent.

It is necessary to make provisions for a basic increase in the production of beef cattle. In this connection, the following have to be provided for:

--An increase in cow herds and of their reproductive capacity.

--An increase in the measure of utilization of cattle for effective feeding.

--Proper feeding of every category of cattle.

--Increase in slaughter quality of animals, especially in fattening. For the optimum live weight of young bulls at the end of fattening, according to the data of workers of the scientific research institute, for thoroughbred Slovak mottle-colored cattle and their cross-breeds with a beef cattle strains, a live weight of up to 600 kg is estimated; for crossbreeding Slovak mottled-color cattle with milk producing strains with a smaller proportion of improvement strains, and for pingauzer breed, from 500 to 550 kg is estimated, and with crossbreeding of Slovak mottle-colored cattle and pinzgauer with milk producing strains with a higher proportion of the blood of improvement breeds (over 50 percent), a live weight of up to 500 kg is estimated. The parameters of added weight in fattening, according to the data of workers of the scientific research institute, should vary slightly within the range of 0.9-1 kg per head per day. We have considerable reserves in this area. In 1979, the average slaughter value of bulls after fattening in Slovakia was 460 kg, with an average daily weight gain of 0.77 kg.

Consequently, in the work for the preparation of the Seventh Five-Year Plan, at all stages of management, it is necessary to work out the possibilities and measures for a maximum increase in the production of slaughter cattle and the provisions for their gradual realization.

In this case, it is necessary to pay particular attention to increasing the production and quality of bulk fodder including material-technical and investment provisions, especially in the areas of harvesting, transport, and storage.

The guideline for preparation of the Seventh Five-Year Plan counts on a basic increase in the harvesting of hay, along with an increase of yield per hectare of

fodder crops, and a decrease in the area sown on tilled soil. A substantial increase in the planting of catch crops, a more intensive utilization of the production capacities of meadows and pastures, and also an increase in the proportion of hay among perennial fodder crops is called for.

During the Seventh Five-Year Plan, the harvesting of hay in Slovakia is supposed to rise 18.2 percent as compared to the expected harvest in the Sixth Five-Year Plan, of which, the harvesting of hay from perennial fodder plants will rise 36.8 percent. The urgency of the task to increase harvesting of hay depends on a relatively greater creation of reserves of bulk fodders, as during this 5-year plan.

The increase in the production and quality of bulk fodders tied into the planned development of livestock production is one of the main tasks of the development of plant production. It is necessary to work out a program at every level of management for providing for the tasks in the production of bulk fodders, for improving their quality, and for providing higher rating of bulk fodders by 10-15 percent with a lowering of the use of grain feeds.

The increase in the production of bulk fodders and in their quality, the increase in the production of meat and milk, with upgrading of domestic fodders, these are the greatest reserves for increasing agricultural production during the Seventh Five-Year Plan.

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CZECHOSLOVAKIA

DISTRIBUTION OF AGRICULTURAL PLANT PRODUCTION IN SSR FOR 1985-1990

Bratislava EKONOMIKA POLNOHOSPODARSTVA in Slovak Nov 80 pp 500-502

[Article by Engr Emilia Osrmanova, Research Institute for Agricultural and Foodstuff Economics, Bratislava: "Survey of Plant Production Development by Natural Area of the SSR to 1990"]

[Text] Employees of the Research Institute for Agricultural and Foodstuff Economics have been working recently, among other things, on the problem of the distribution of agricultural production and its labor force for the period 1985-1990.

The goal of this task has been to provide management and, above all, planning agencies with scientifically justified foundations for an objectivization of the spatial differentiation of production assignments by region, district, and natural agricultural zones, on the basis of common initial conditions, the productive capabilities of the land stock, and unified criteria for the economic efficiency of the distribution of agricultural production.

The distribution of plant production is a matter of implementing land division on the basis of enterprise specialization and the concentration of agricultural production based on the optimal utilization of varying natural and economic conditions.

An objectivized approach to distribution has also required a classification of agricultural land which characterizes natural conditions with sufficient precision and makes possible at a given level of management the rational analysis, evaluation, and differentiation of the intensity of agricultural production under varying natural conditions. These requirements are met by a system of natural agricultural zones arrived at by an appropriate aggregation of natural conditions.

The distribution of individual production branches has therefore been differentiated according to areas possessing the proper natural and economic production characteristics, while the surface area to be occupied in the districts and regions of the SSR has been worked out by the employees of the Research Institute for Agricultural and Foodstuff Economics in Bratislava. 15 natural agricultural zones have been defined for the SSR within the framework of 4 climatic regions. They are the areas of:

- the warm lowlands (Nt 1, Nt 2, Nt 3, Nt 4),
- lowlands (N 1, N 2, N 3),
- hill country (P 1, P 2, P 3, P 4),
- mountain (V 1, V 2, V 3, V 4).

The whole distribution process took place in two phases.

The first phase saw the preparation of economic production parameters, i.e. the processing of data concerning the land stock in addition to the processing of input data from models based on technical economic studies from specialized institutes.

Above all it has been necessary to divide the land stock of the districts and regions of the SSR into natural agricultural zones according to individual crops, which is the basis for the distribution of plant production. Each area has definite production conditions for a given crop.

Altogether 71 production branches of plant production have been distributed (including the aggregates which have been formed).

All crops are classified as either "high volume" or "low volume."

Among the high volume crops are wheat, rye, barley, oats, grain corn, cereals generally, food potatoes, potatoes generally, feed peas, tubers, fodder legumes generally, sugar beets, perennial fodder crops on arable land, silage corn and corn to be plowed under, fodder beets, other cultivated fodder crops, and fodder crops generally on arable land. The following input data for these crops were applied in a modelling treatment:

- the extent of the share of sown area of the crops on arable soil (in percent),
- the per hectare harvest (in tons),
- sowing/planting standards per hectare (in kilograms),
- the yearly alternation of seeds and seedlings (in percent),
- consumption of industrial fertilizers - pure N-P-K nutrients (in kilograms),
- need for biocontrols and chemical protective substances (in Kcs),
- labor consumption per unit of surface area (in hectares).

The following crops have been included in the low volume group: lentils, kidney beans, edible peas, sunflower seeds, soy beans, poppy seed, seedling, industrial, and early potatoes, sugar beet sets and seeds, flax, hemp, vegetables (including tomatoes, pickling cucumbers, peppers, cauliflower, cabbage, onions, garlic, and early vegetables), medicinal and aromatic plants, tobacco, grass seed, and other crops raised on arable land (nurseries for fruit and ornamental trees, plots for vegetable and flower seeds, and the like). These crops have been distributed directly to districts and regions with a view to the requirements of the crop, the maximum utilization of natural conditions, husbandry traditions, and the most recent scientific findings.

In the second phase, the so called "automated modelling system," and in particular two linear programming block models have been used to implement the distribution of the production and the procurement of plant production. The first model distributed the production objectives for the SSR which have been determined for individual agricultural areas according to the unified foundations for the development of the agricultural and nutrition branch to 1990 (as established by the Federal Ministry of Agriculture and Nutrition). The second model provided assistance in distributing the objectives determined by the first model to the regions.

In the first model, inequalities are used for each distributed crop to determine the lower and upper limits of the required volume of output at the republic level. In the blocks for individual agricultural areas equations are used to determine the extent of useable land area, while inequalities are used to determine the upper and lower limits of the sown area for raising each crop.

In a connecting block, the second model determines by means of equations the sown area and production volume (this information is an output of the first model) for each crop of a given agricultural area, and uses equations in regional blocks to establish the extent of useable soil in a given region and the lower and upper limits of the sown areas for specific crops. The object of maximization is the total output in a given natural agricultural zone, expressed in units of grain.

Both models take into account the appropriateness of natural conditions for the raising of the distributed crops by applying differentiated per hectare yields and sown areas. The outputs of these distribution models for plant production are the basis for the development of planting plans for a region and provide part of the input information for the distribution of livestock production.

The structure of sown areas which results from this solution incorporates composite trends determined for individual bases. For instance, in comparison with the 1971-1975 average the area sown with grain corn will increase by about 60,000 hectares by 1990, and the area in rye by about 4,000 hectares, while the area in barley will decrease by about 33,000 hectares. Legume area is to be increased by about 8,000 hectares in 1985 and by 17,000 hectares by 1990. Of the oil crops, the largest increase will be in the area sown in sunflowers, which will rise from 3700 hectares to 20,000 in 1985, and to 23,500 hectares in 1990, while the area sown in soy beans will increase from 4,000 hectares to 9,000 in 1985, and 12,000 hectares in 1990. The area in potatoes is to be lowered from 85,000 hectares to 65,000 in 1985, and to 55,000 by 1990.

Results regarding the distribution of sown areas according to natural agricultural zones for the 1985-1990 period have been processed in two directions:

- in terms of the area concentration of crops in individual natural agricultural zones of the SSR, and grouped by regions, which expresses the significance of a given region in the raising of a particular crop;

- as the structure of sown areas on the arable land of individual areas of the SSR (in percent);

- as the percentage, in individual natural agricultural zones, of the total area sown on the territory of the SSR, and grouped by regions, a figure which expresses the appropriateness of the growing conditions in specific areas for a given crop (in percent).

We present the results of the distribution of several major crops (in hectares) throughout the natural agricultural zones of the SSR for 1985 in the accompanying table (the 1990 results are only slightly different). In addition to the crops raised on arable soil, permanent agricultural endeavors were also the subject of distribution.

Table 1. Areas Sown with Several Major Crops, by Natural Agricultural Zones of the SSR (in hectares)

Crop	Natural Agricultural Zones					
	Nt 1	Nt 2	Nt 3	Nt 4	N 1	N 2
Wheat	26787	62110	23577	15709	32804	58033
Barley	9039	18266	5525	8857	20717	32601
Maize	29914	76404	15754	7801	26658	15970
Cereal Grains total	65740	156913	45488	37368	80179	108882
Edible Legumes total	100	2700	850	150	1200	1000
Fodder Legumes total	2215	4434	1557	-	4907	6399
Winter Rape	554	1318	872	1434	692	4855
Sunflowers	3600	8450	850	350	2850	2400
Industrial Sugar Beet	8353	11370	4751	2067	10072	9172
Tobacco	255	1770	1100	330	865	575
Potatoes total	400	1150	1250	1583	200	975
Fodder Crops on Arable Land total	24799	56437	15776	18645	30832	45425
of which, Perennial Fodder Crops on Arable Land	18144	33971	6123	11129	17511	27705
Vegetables total	3085	8474	2876	1030	2719	2675
Arable Land total	112987	258790	78906	63268	137512	185189

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Crop	Natural Agricultural Zones					
	N 3	P 1	P 2	P 3	P 4	V 1
Wheat	27460	13217	42559	11442	30789	3973
Barley	23607	11465	27694	11097	35772	7393
Maize	12789	2143	5513	-	5212	-
Cereal Grains total	65252	27830	79970	24319	78614	13987
Edible Legumes total	800	100	-	-	-	-
Fodder Legumes total	4016	893	4834	728	113	-
Winter Rape	1956	1244	4357	1040	4739	-
Sunflowers	1700	-	-	-	-	-
Industrial Sugar Beet	6234	1911	4830	-	1393	-
Tobacco	305	-	380	-	240	-
Potatoes total	1625	1228	1445	2829	8153	4740
Fodder Crops on Arable Land total	21754	8941	35995	11344	38460	9248
of which, Perennial Fodder Crops on Arable Land	10489	5032	20838	6571	24136	6606
Vegetables total	2266	795	2064	988	1661	284
Arable Land total	107034	44079	137595	42592	136289	29239

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Crop	Natural Agricultural Zones			SSR total	
	V 2	V 3	V 4	hectares	percent
Wheat	10210	11397	9143	379,210	24.00
Barley	12249	19974	34038	278,293	15.71
Maize	-	-	-	198,157	12.54
Cereal Grain total	26796	39887	58263	909,488	57.56
Edible Legumes total	-	-	-	7,000	0.44
Fodder Legumes total	798	-	-	30,894	1.96
Winter Rape	-	-	-	23,061	1.46
Sunflowers	-	-	-	20,200	1.28
Industrial Sugar Beet	-	-	-	60,153	3.81
Tobacco	-	-	-	5,820	0.37
Potatoes total	8677	12800	18090	65,145	4.12
Fodder Crops on Arable Land total	18474	22329	35279	393,738	24.92
of which, Perennial Fodder Crops on Arable Land	12563	15277	27374	243,469	15.41
Vegetables total	668	394	250	30,229	1.91
Arable Land total	57256	76698	112566	1,580,000	

The distribution proposal calls attention to the basic interzone relationships in the growing of "high volume" and "low volume" crops in the following ways:

1. In the warm lowland area (Nt), grain will increase as a percentage of total production, due to an increase in the area devoted to grain corn, even while the area sown in wheat and barley will be decreased moderately. The Nt 2 area will have the largest percentage of grain (60.7 percent). The raising of edible legumes will be concentrated in the Nt 2 area, independent of their continued share of Nt 4 production. The percentage of early potatoes will increase in all four areas, a consequence of concentrating them in the warmest areas. Winter rape will decrease as a percentage of oil crop production, but the percentage of sunflowers and soy beans will substantially increase;

2. A similar trend to that of the Nt group will become evident in the lowland group (N) in grain and oil crops. The greatest increase, however, will be in feed legumes which, for instance, in area N 3 will increase their share from 3.8 percent to 5.7 percent of the total by 1990. The share of perennial forage crops will decrease;

3. The grain share in the foothill group (P) will also increase, due to an increasing percentage of grain corn and barley. Increased legume plantings will be concentrated in the P 1 and P 2 regions where they will occupy 6 percent of the arable soil. Winter rape will come to occupy 3 percent of the arable soil in the P 2 and P 4 areas, the percentage of potatoes in areas P 1 and P 2 will decline, while increasing in areas P 3 and P 4 to the vicinity of 6 percent of the total. Here as well the share of perennial fodder crops will be partially reduced;

4. In the mountain group (V), the main growing zones are devoted to oats and rye, while at the same time the share of other grains will be increased. Legumes are to be grown only in area V 2. The percentage of potatoes is to reach 16.6 percent of the total in area V 3 by 1985, and 16.5 percent of the 1990 total in area V 1. Fodder crops on arable land will be marked by a moderate decline.

The results of the distribution of crops by natural agricultural zones has been further broken down by the districts and regions of the SSR by an additional linear programming model.

In the West Slovakian region the area sown in grain corn will expand the most, from 13 percent to 18.9 percent of the total, while the areas sown in oats and wheat will see particular declines. The share of all grains will reach almost 60 percent. The percentage of legume crops (especially for livestock) will increase from 1.6 percent as of 1975 to 3 percent by 1990. The area sown in sunflowers and soy beans will increase significantly (and become more than 3 times that of 1975), at the same time that the area sown in rape will moderately decline. The percentage of potatoes will decline, with production focusing mostly on early potatoes, while in the Topol'cany and Trencin regions efforts will be concentrated on industrial potatoes. The share of perennial fodder crops will increase at the expense of grain corn and silage.

In the Central Slovakian region the percentage of grains (excluding oats) will increase from its 49.9 percent figure for 1975 to 55.1 percent by 1985, and 65.3

percent by 1990. The total share of legume crops will remain unchanged, but their concentration by region will change significantly. For instance, edible legume crops will be concentrated in 3 regions, in comparison with 12 regions in 1975. The percentage of oil crops will increase from 0.9 percent to 2.4 percent, primarily by expanding the area sown with winter rape. The percentage of potatoes will be decreased from 10.7 percent to 8.1 percent, and to 6.3 percent by 1990, at the same time that the raising of early potatoes will be concentrated in 4 regions. The percentage of fodder crops on arable soil will decline moderately.

In the East Slovakian region the percentage of grains will increase from 48.3 percent to 55.9 percent, primarily by increasing the share alloted to wheat from 13.7 percent to 22.4 percent, and that of grain corn from 5.2 percent to 7.1 percent. The percentage of barley will decrease from 24.9 percent to 21.2 percent. The area devoted to feed legumes will be substantially increased and that devoted to edible legumes lessened, and their raising concentrated in 3 regions. Primarily in the southern regions there will be a decline in the percentage of potatoes from 7.9 percent to 7.1 percent and, by 1990, to 6.1 percent, while in the northern regions their production will remain at roughly its present level. The greatest reduction in the area of arable land sown in fodder crops is to be in this region, from 31.6 percent to 26.5, and in some cases 27.2 percent by 1990.

It may be justifiably presumed that the implementation of the distribution proposal in accordance with husbandry requirements will increase the certainty of achieving per hectare yield targets, and that lowering the costs per unit of production will increase production efficiency.

The distribution and balance of industrial fertilizers has been realized in accordance with this modelled distribution of crops. Doses of pure N-P-K nutrients (in kilograms) have been established for each crop and for each natural agricultural zone according to the level of the per hectare harvest.

The distribution of livestock production, of investment for the Seventh and Eighth Five Year Plans, the relation of agricultural production to the distribution of its processing industry, the distribution of the work force and the requirements for labor value added according to natural agricultural zones will all be connected to the distribution proposal for plant production.

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END