

# SOME PROBLEMS OF THE DEVELOPMENT OF SUGAR MAKING INDUSTRY OF THE SOUTH MORAVIAN REGION

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## SUMMARY

The present study solves the fundamental geographical problems of the development of the sugar industry of the South Moravian Region. The introductory part deals with the basic problems of sugar beet in Czechoslovakia, where above all the unsatisfactory situation in the production of this fundamental foodstuff is pointed out. The contemporary production results are also confronted with the results achieved in the neighbouring countries. The main part of the paper then represents the study of selected geographical aspects of the sugar industry of the South Moravian Region. Attention is paid above all to the distribution of the basic procession capacities in the region, their situation and technical equipment, as well as to the problems of transport and the evaluation of the individual collecting areas.

Among the fundamental raw materials in the sphere of foodstuffs belongs sugar, on which almost 20 % of the whole market consumption of foodstuffs depends either in the form of direct consumption or as a raw material for further foodstuff production. Also sugar as a raw material for the developing biotechnological production is an important factor. However, in recent years it has not been successful to guarantee the intensity of sugar beet production and thus also its required efficiency. The troubles facing our country are well-known. The physical state of beet growing soil does not guarantee the expected yields, the soil has been excessively solidified due to insufficient organic fertilizing. The unsatisfactory state is also assisted by a considerable occurrence of soils with the reaction below 6.5. pH. There are also drawbacks in the sphere of chemical protection, not much better is the situation in the equipment of drills as well as in the level of available mechanization, particularly harvesting technology. Harvest losses frequently exceeding 15 % are a sad document thereof.

At present the CSFR lags behind developed beet growing countries in Europe in the production of sugar and sugar beet, although it has the second best results (after Hungary) in comparison with the CMEA countries. Whereas abroad the yields of refined sugar increased by 29—107 % from 1920 to 1975—1980, in the CSFR the yield of refined sugar only got to the level of 94 % of the period 1931—1935. The mean hectare yield in the 6th five — year plan in the CSFR was 33.42 t, in Austria and in the FRG 46.25 t and 47.25 t respectively, in Hungary, the GDR and Poland it was 36.83 t, 22.77 t and 27.99 t, respectively. Similarly, in the period of 1984—

—86 the mean yield in the CSFR was 36.56 t, in Austria and the FRG 52.56 t and 51.00 t, respectively, in Hungary, the GDR and Poland it was 38.06 t, 32.42 t and 32.81 t, respectively. In comparison with developed sugar beet growing countries of Europe producing as much as 7 t of refined sugar per hectare, the CSFR reaches only 50—60 % of that level. Thus, the production of refined sugar in Austria exceeds our production 2—2.5 times. These differences are above all due to different agroecological conditions and maintaining technological discipline. Estimating the effects to increasing the yield of refined sugar to the level of 5.5 t/ha in our country, greatest stress was laid on the state of the soil (22 %), further on the quality of the harvest and sowing and the number of individual plants (15 % each), nutrition (12 %) and the quality of the seed (11 %). Among the other effects are included: the autumn preparation of the soil and spring works, storage of sugar beet, reception and manipulation with it, effects of diseases, pests, etc. Despite these known causes of lagging behind in the production of sugar beet and sugar and a variety of measures aimed at repairing the situation, it did not improve. The plan of sugar beet production for the years 1986 to 1988 was not fulfilled by 15.5 %, the level of the assumed sugar content is not reached either, the plan of production, 5650 thousand tons of sugar beet was fulfilled to only 65.8 %. The mean annual production of sugar from sugar beet for the last three years is even lower than the mean annual production in the preceding five -- year plan. The causes of the losses are, however, also due to the restriction of the area of growing sugar beet. Thus, in 1988 there was a restriction by 25 % in comparison with 1985. Lack of interest of agricultural enterprises as a result of all hitherto existing difficulties, from technical, organizational up to economic ones in this plant will probably be the reason of further reduction of areas. One of the persisting and main reasons of this lag is the shortage of decisive machines and equipment for growing and harvesting, an adverse role is that of insufficient coverage by suitable pesticides with impacts on increasing requirements for human work. A disproportionate share of wages invested into every hectare of sugar beet is not adequate in comparison with other crops. As for the individual regions, the highest shares in the production of sugar beet are those of the Central Bohemian, West Slovak and South Moravian Regions, taking up 21.5 %, 21.0 % and 20.6 % of crop areas of the CSFR. The highest sugar beet harvest is in the South Moravian Region, 1.550 to 1.800 thousand tons per year, which is above all due to the highest hectare yields of the region.

### THE IMPORTANCE OF GROWING SUGAR BEET

The results of growing sugar beet influence, however, directly or indirectly, also the living standard of the population, because the condition the direct consumption of sugar in the nutrition, further indirect consumption via the individual branches of the foodstuff industry, providing the nutrition of farm animals, the balance of foreign trade and further fertilization of the soil. By the per capita consumption the CSFR ranks among the foremost countries in the world. In recent years sugar consumption has stabilized at about 39 kg per capita, which is by about 30 % more than the recommended dose (28 kg). In the prospects to the year 1995 direct sugar consumption is supposed to be very high, 37 kg of sugar per capita. Also the indirect sugar consumption is high, particularly in the products of sweets and pastries, etc. Another amount of sugar is utilized in the fermentation canning industries. All that

consumption is covered from our own resources. Besides sugar, sugar beet yields a number of important byproducts representing valuable resources of fodders for live-stock production. Leaves and cut-off parts (100 % of the sugar beet bought), extracted cuttings (52 %), dry matter (10 %), molasses (5.6 %) and saturation sediments (7 %). The leaves obtained in the harvest, extracted cuttings and part of molasses determined for the consumption in agriculture in the amount of about 0.4 t/ha are irreplaceable items in the fodder balance, the feeding value of only cut-off parts and cuttings corresponds to the feeding value of 1.20 ha alfalfa or 1.5 ha wheat. The importance of growing sugar beet from the point of view of the whole crop production cannot be neglected, either. This crop forms optimum conditions in the crop areas by creating a suitable structure of the soil if the required agrotechnology is observed, improving the soil's physical, mechanical and agrotechnical properties.

On reaching the planned production of sugar part of it becomes an important commodity of foreign trade, because for this item it is possible to obtain hard currency for buying goods that cannot be produced under our conditions. Sugar, together with hops, thus still forms the main part in the export of agricultural and food-stuff products. Even at present, when Czechoslovak sugar beet and sugar factory position in the world has dropped, the importance of sugar beet and sugar for the national economy and for Czechoslovak foreign trade is not lowered. The underestimation of sugar beet for agriculture or sugar for foreign trade in the past is reflected in grave consequences and means a threat for the effective participation of the CSFR in the international division of labour in the future. The volume of sugar export from the CSFR has a declining trend. Whereas in the years 1920—28 it was almost one million tonnes and in 1953 still more than 500 tonnes, at present the mean physical volumes which are about 200 thousand tonnes (including sugar produced from the Cuban raw material) must be considered minimal.

## THE PRESENT SITUATION IN SUGAR PRODUCTION

The task of our sugar producing industry is to secure the procession of sugar beet with minimum losses under reducing the energy requirements, thus safeguarding resources of sugar both for inland production and for export. But in this very sphere a number of our sugar factories lag behind the present trend in the world. The fundamental trends of the sugar producing industry abroad for the last 40 years have been characterized by reconstructions, modernization of processes, continualization, improving machines and equipment and, at present, a high degree of automation. On the other hand, the technological equipment of the sugar producing industry in the CSFR has a high degree of wear, a low technological level (in comparison with sugar factories abroad) and particularly low procession capacities. According to J. Kašánková and C. Perlín the wear of the fundamental means at present is 60.9 %. Still worse is the situation in the section of energetic and driving machines, where the wear amounts to 71.7 %. Quite written of fundamental means amounted to 31.4 % in the CSFR, but in the CR to 62 %. This situation is the reason for serious lag of the sugar producing industry behind the world level in all main technological and economic indices. The mean procession capacity of one sugar factory in the CSFR is 1450 t sugar beet per day, which is the lowest in Europe. The consequence thereof (in connection with the outdated machine equipment and a low degree of automation

and the unsatisfactory age and qualification structure of the operators) is the low productivity of labour expressed by the consumption of a worker's time for processing one tonne of sugar beet. In the CSFR this time is 125 minutes, whereas large-capacity and fully mechanized sugar factories abroad reach the time of 8—20 minutes. Also the consumption of specific fuel, which abroad reaches maximum 4 % of the sugar beet purchased is more than twice as high (9 %) in our country. The economic impact is the annual loss amounting to 900 million Kčs as a consequence of low production effectivity in comparison with the present world standard.

## **GEOGRAPHICAL ASPECTS OF SUGAR PRODUCING INDUSTRY IN THE SOUTH MORAVIAN REGION**

Sugar factories were mostly built in the latter half of the 19th century in the main regions of sugar beet growing. Most sugar factories produced rough sugar (unrefined), only large sugar factories refined also rough sugar brought from small ones. In establishing sugar factories an important role was played by the following factors influencing the choice of the site:

1. Sugar factories were built in the centres of sugar beet growing areas, outside large towns, at the outskirts of settlement units.
2. Since large requirements were put on the transport of sugar beet, there was a strong relation to the railway or the road.
3. An important factor for the site choice was also water which is necessary in the technological production process.

Water was drawn from local streams and rivers and after use it was again returned to the water stream. Some sugar factories which had been built towards the end of last century were repaired, other rebuilt, but a great majority have highly worn machinery. A number of those small sugar factories have been abolished, but some of them have been processing sugar beet up to now.

At present the production network of the South Moravian Region includes 13 sugar factories which process on the one hand sugar beet grown in the South Moravian Region, but that crop is also imported from the North Moravian and the West Slovak Regions. Sugar factories are all located in regions with intense growing of sugar beet. The Headquarters of South Moravian Sugar Factories is situated at Uherské Hradiště, where all information concerning the amount of sugar beet processed, length of the processing period, quality, sugar content etc. is concentrated. The list of sugar factories in the South Moravian Region:

**Sugar factory 01 Bedihoř** — is situated in the central part of Prostějov District. It was founded in 1851. Its procession capacity is 850 t/24 hrs, which has not changed since its foundation. It is the smallest sugar factory in the region. The sugar factory has obsolete production equipment. Water necessary in the technological process is drawn from the small river Valová. Its water economy is out of date, it has no sewage treatment plant, which results in the pollution of the water source.

**Sugar factory 02 Břeclav** — is situated in the district capital. It was established in 1862. It is situated on the bank of the river Dyje from which it takes the water for the production. The water economy is of the continuousflow type i.e. the water which passes through the whole process of production is not treated and returns

to the river. The sewage treatment plant is missing and so the water of the river Dyje is polluted. The sugar factory was reconstructed several times, for the last time in 1983. Its capacity is 1600 t/24 h.

**Sugar factory 03 Čelechovice** — district Prostějov, was founded in 1840. The equipment was out-of-date and so it was closed down in 1982.

**Sugar factory 04 Hodonín** — was founded in 1886. In 1986 its reconstruction was finished which was carried out in only the rough-product part where the capacity was increased to 3000 t/24 h, the refinery has the capacity of 1500 t/24 h even today, and that is why half of the production thick juice does not go directly to the refinery, but is stored in tanks and refined after finishing the production season. This kind of production is unique in the South Moravian Region. The product is coarse granulated sugar which is stored in a silo newly built there. It draws the water from the river Morava, has a comprehensive water economy with a sewage treatment plant. Every sugar factory has its own boiler plant, but this one is an exception. Steam is drawn by a steam pipeline from the power plant of Hodonín. The factory is highly mechanized.

**Sugar factory 05 Hrušovany nad Jevišovkou** — is situated in the district Znojmo. It was built at the site of an abolished sugar factory in 1969. Its capacity is 4200 t/24 h. The factory has its own refinery, producing fine granulated sugars, thick juice for pharmaceutical industry, castor sugar and lumps. It takes water from the small river Jevišovka. The water economy meets the present requirements, water from a sedimentation pond is used for irrigation in agriculture.

**Sugar factory 06 Hulín** — was established in 1910, its capacity being 1050 t/24 h. Its reconstruction was finished in 1981. It has a gas boiler plant. Only raw sugar is produced there which is transported for further procession into sugar factories of Všetuly and Uherské Hradiště. Water is drawn from the stream Rusava, in 1982 traps of solid parts in the sewage were installed.

**Sugar factory 07 Němčice nad Hanou** — district Prostějov, was founded in 1910. Its capacity is 1450 t/24 h, but by means of gradual reconstruction it is to be increased to 2000 t/24 h. In 1984 a new boiler house was built that uses masout as fuel, in 1986 a new lime works. In the 9th five-year plan a comprehensive sewage treatment plant will be built which will improve the purity of the stream Haná from which the factory draws water. The factory includes a refinery producing coarse granulated sugar, lumps of the Bridge type and sugar loaves. The products are of high quality and are exported abroad, chiefly to Middle East countries.

**Sugar factory 08 Slavkov** — was established in 1872, its processing capacity being 1160 t/24 h. In 1965 the refinery was reconstructed, in 1986 a new filtering station was built. Under the 9th five-year plan there will be further gradual reconstruction resulting in increased capacity. The products are coarse granulated sugar and castor sugar. Water is drawn from the stream Litava and the water régime of the sugar factory consists of a closed circuit of ponds from where the water is taken and at the same time cleaned.

**Sugar factory 09 Sokolnice** — district Brno-Country was founded in 1884. Its present capacity is 1200 t/24 h. It produces only raw sugar which must then be transported

for processing to sugar factories at Břeclav and Slavkov. The factory was gradually reconstructed and today it is on a high technical level. The water economy is of the flowthrough type, which results in the pollution of the Zlatý potok brook, a tributary of the Litava, from which water is drawn.

**Sugar factory 10 Uherské Hradiště** — was founded by a jointstock company in 1868. After small adaptations it was finally reconstructed in the 1980s. Its procession capacity is 1620 t/24 h. It includes a refinery and the production is varied. Coarse and fine granulated sugar, lumps and castor sugar are produced. The water economy is of the flow-through type and that is why the water from the Morava river returns to the river polluted. The factory has been chosen for reconstruction to the capacity of 3400 t/24 h.

**Sugar factory 11 Vrbátky** — district Prostějov, was founded in 1870. The factory has its own refinery processing only sugar produced there. Coarse granulated sugar is produced which is exported to Arab countries. It was reconstructed in 1986, thus acquiring a high level of technology. Its capacity is 1170 t/24 h. It is provided with old, but closed water economy whose source is the small river Blata and a special pond.

**Sugar factory 12 Všetuly at Holešov** in the district Kroměříž was established in 1882. It has a refinery working also for sugar produced in the factory of Hulín. Its capacity is 1100 t/24 h. It produces coarse granulated sugar and liquid sugar of 99 % purity. This liquid sugar is stored in tanks and supplied to the chocolate factory Sfinx at Holešov. The factory has a closed water economy with saturation ponds and water reservoirs. Water is drawn from the stream Rusava.

**Sugar factory 13 Vyškov** was founded in 1868. Starting with 1960 a gradual reconstruction was carried out. The factory has a raw-sugar works, i.e. it produces raw sugar. Its capacity is 1500 t/24 h. It takes water from the small river Haná as well as from wells. The water economy is closed, but it does not meet today's requirements.

**Sugar factory 14 Židlochovice** is the oldest in the South Moravian Region, being founded in 1837 as an imperial sugar factory. It has a raw-sugar works with the capacity of 950 t/24 h. Its gradual reconstruction has been carried out since 1960. It draws water from the river Svratka and has a flowthrough type of water economy.

From the above characteristics it follows most sugar factories of the South Moravian Region were established towards the end of the 19th or at the beginning of the 20th centuries. An exception is the factory at Hrušovany nad Jevišovkou built in 1969. All sugar factories have a high degree of wear, a low technical level and low processing capacities. The reconstruction of most sugar factories started in 1960 and has been going on up to the present by gradual exchange of outdated equipment for a more modern one. Out of 13 plants 9 have a finished production cycle, i.e. the production ends with refined sugar, only factories Hulín, Sokolnice, Vyškov and Židlochovice have only raw-sugar plants. Altogether about 175 thousand tonnes of refined sugar are produced in the South Moravian Region every year.

All production of sugar factories depends on the consumption of water. In the sugar factories of the South Moravian Region the mean water consumption is 1 to 10 m<sup>3</sup>

per 1 tonne of the sugar beet processed. The lowest consumption is in the factories at Hrušovany and Hodonín (1 m<sup>3</sup>/t), the highest at Vrbátky (10 m<sup>3</sup>/t). In the reconstruction of the factories effort is laid on the lowering of the water in production. From this fact it follows that the lowest water consumption is in the newly adapted factories, and, on the other hand, those with the old equipment have a higher consumption of water. More than a half of the sugar factories have a flow-through type of water economy. They are sugar factories Bedihošť, Břeclav, Némčice, Sokolnice, Uherské Hradiště, Vyškov and Židlochovice. Those factories pollute the water streams from which they draw water. Of course, there is an effort at equipping in the future all sugar factories with sewage water treatment and with a closed water economy, as is the situation in the remaining 6 factories. That would greatly reduce the pollution of streams. But those problems cannot be solved at once, it requires a long-term programme.

### EVALUATION OF THE COLLECTING AREAS OF SUGAR BEET

A collecting area of a sugar factory is the territory from which sugar beet is transported to the factory to be processed. The size of the collecting area is given above all by the capacity of the factory and by the length of the sugar beet season. The greater the capacity and the longer the sugar beet season, the larger is the collecting area. Collecting areas of the individual sugar factories were determined in such a way as to minimize the costs of the transport of the heads and the cuttings. At present, the concentration of agricultural enterprises, the development of transport and the energy requirements, above all the consumption of fuel, which is often a limiting factor, have the influence on the economy of the collecting areas. On the basis of including agricultural enterprises into collecting areas the sugar factories conclude economic agreements with them. The agreements specify the requirements for the amount and quality of sugar beet, they state the beginning of the harvest and of the delivery of the sugar beet to the factory, etc. These agreements are concluded for the whole five-year plan and are then specified for the individual years.

The largest collecting area in the region is that of the factory at Hrušovany nad Jevišovkou, which has also the greatest procession capacity (4200 t/24 h). The length of the sugar beet season is 89 days, in one sugar beet season it processes on the average 374 000 tonnes of sugar beet from the area of 10.4 thousand hectares. The suppliers of that sugar factory are agricultural enterprises from the whole district Znojmo (excepting the UACs Blížkovice and Jevišovice, where they no longer grow sugar beet), further from the eastern part of the district Třebíč and the southwest part of the district Brno-country and a part of the district Blansko.

The second largest collecting area is that of the sugar factory at Hodonín. Its capacity is 3000 t/24 h, the sugar beet season lasts 85 days and it processes 152 thousand tonnes of sugar beet from the area of 4.3 thousand hectares. The factory is supplied by agricultural enterprises from the district Hodonín with the exception of its easternmost part where there are no conditions for growing sugar beet. The factory at Uherské Hradiště had the second largest capacity, before 1985, but by the reconstruction of the factory Hodonín it became third. The average length of the sugar beet season was 75 days and in that time it processed 126 thousand tonnes of sugar beet from 3.2 thousand hectares. The factory is supplied by agricultural enterprises from

the whole of the district Uherské Hradiště with the exception of the UACs Bánov and Nedachlebice.

The sugar factory Břeclav has the average length of the sugar beet season 67 days, it processes 105 tonnes of sugar beet from 3.2 thousand hectares. It processes sugar beet from agricultural enterprises of the district Břeclav with the exception of the northern part of the district (UACs Velké Némčice and Šitbořice). The sugar factory Vyškov is one of the two factories in the district Vyškov. The length of its sugar beet season is 73 days, processing 110 thousand tonnes of sugar beet from the area of 2.8 thousand hectares. The collecting area takes up the northern and central parts of the district, with the exception of the eastern part (UAC Ivanovice na Hané). The southern part of the district Vyškov falls into the collecting area of the factory Slavkov, whose sugar beet season lasts 76 days and which processes 88 thousand tonnes of sugar beet from the area of 2.4 thousand hectares. The sugar factory Némčice nad Hanou is one of the three factories in the district Prostějov. It has the largest capacity as well as the collecting area which takes up the southern part of the district and also the eastern part of the district Vyškov (UAC Ivanovice). The length of the sugar beet season is 70 days and it processes 102 thousand tons of sugar beet from 2.5 thousand hectares. There are two sugar factories in the district Brno-country. The factory Sokolnice has a larger capacity and thus also a larger collecting area. That covers the northern and the eastern parts of the district. In 67 days the factory works up 80 thousand tons of sugar beet from about 2.0 thousand hectares. The sugar factory Vrbátky is another one in the district Prostějov. It processes sugar beet from the area of 2.4 thousand hectares in 86 days, the total amount of the sugar beet being 101 thousand tonnes. The collecting area is the central part of the district Prostějov, linking up with that of the factory Bedihošť.

There are also two sugar factories at the district Kroměříž. The factory at Všetuly has a larger capacity processing 101 thousand tonnes of sugar beet from the area 2.6 thousand hectares in 92 days. The sugar beet is brought from the western part of the district Kroměříž, from the eastern part (with the exception of the UAC Bystřice p. H., supplying sugar beet to the North Moravian Region) and from the western part of the district Zlín. The factory Hulín processes 75 thousand tonnes of sugar beet from the central part of the district Kroměříž. The length of the season is 71 days, the area from which it is supplied is 1.8 thousand hectares. The smallest sugar factories of the South Moravian Region in their capacity are the factories Židlochovice and Bedihošť. Those two factories have also the smallest collecting areas. The factory Židlochovice processes sugar beet from the central and southern parts of the district Brno-country and from the northern part of the district Břeclav (UACs Velké Némčice and Šitbořice). In 93 days it processes 89 thousand tonnes of sugar beet from the area of 2.2 thousand hectares. The factory at Bedihošť works up 68 thousand tonnes of sugar beet from the area of 1.7 thousand hectares in 79 days. The collecting area of that factory is situated between those of the sugar factories Némčice nad Hanou and Vrbátky in the central part of the district Prostějov. In some areas the production of sugar beet exceeds the possibility of its procession, in others the factories are insufficiently supplied from their areas. Every year large amounts of sugar beet have to be transported, from which fact the following negative consequences follow:

- a) increased costs of raw material transport;
- b) losses in quality in long-term storage.

This phenomenon is most apparent in the case of the sugar factory Hrušovany nad Jevišovkou, whose collection area is divided into two parts. The first part



includes the district Znojmo, the SW part of the district Brno-country and the eastern part of the district Třebíč. The factory itself is situated in this part. The second part is represented by the growing area of sugar beet in the central part of the district Blansko. That district has not so good conditions for growing sugar beet, so that in one year about 30 thousand tonnes are grown there. This amount would, however, not be sufficient for supplying a sugar factory and thus the sugar beet from that territory must be transported for processing into other districts. A certain paradox is the fact that the nearest sugar factories are situated in the district Brno-country — Sokolnice, Židlochovice, but those factories have a low processing capacity and so they work up sugar beet only from their nearest environment. The sugar factory Hrušovany, on the other hand, has the largest capacity in the region and thus its consumption is also covered by importing the sugar beet from those distant regions. From the economic point of view a question arises, whether it is more advantageous to extend the capacity of sugar factories on the territory of Brno-country or continue these imports from distant areas (see the map appendix No. 1).

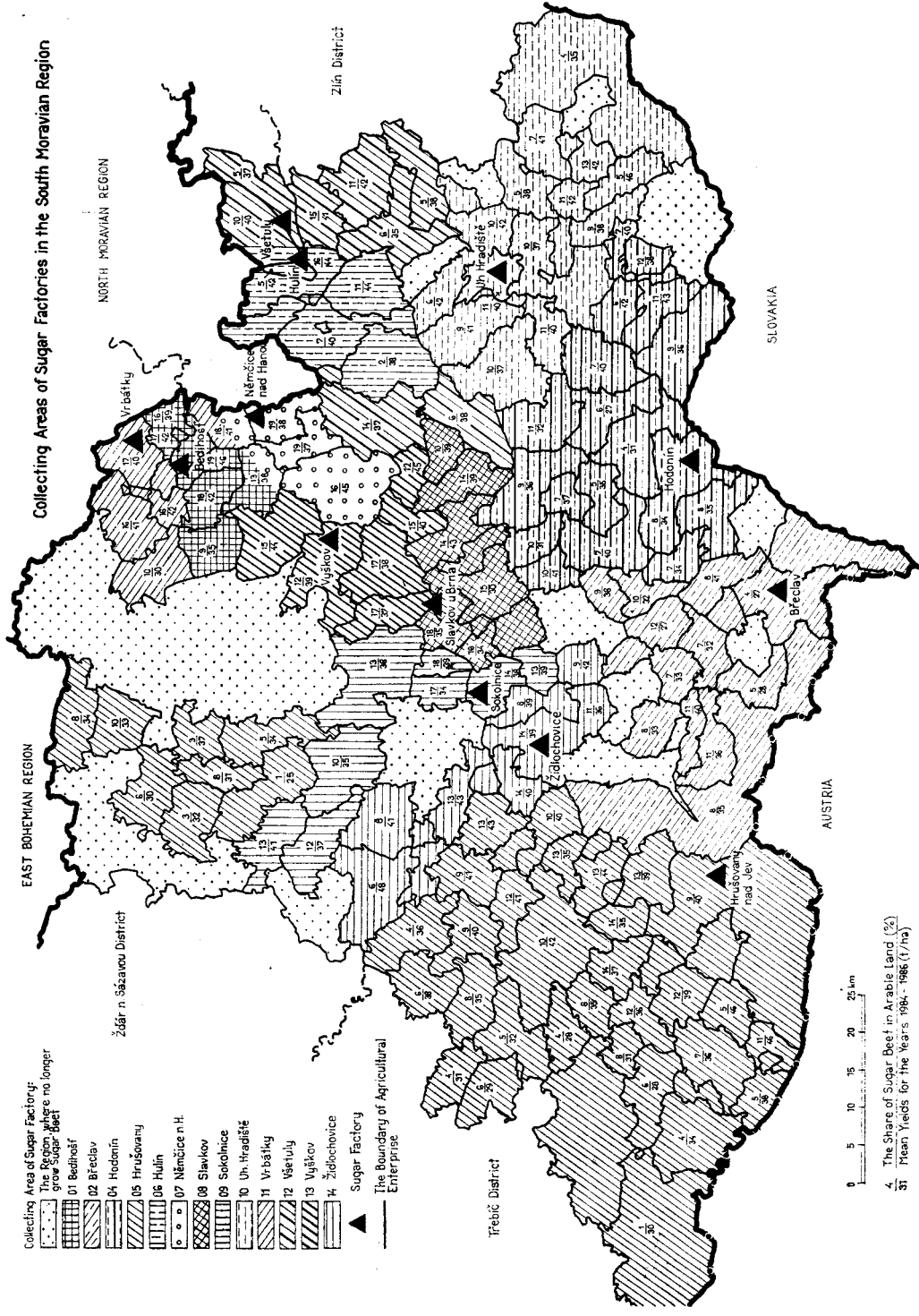
### SUGAR BEET TRANSPORT

The transport of sugar beet from the fields into the sugar factory goes in two phases:

1. The transport is carried out by the grower by his own means of transport, lorries or tractors.
  - a) the harvested sugar beet is transported straight into the factories (i.e. in enterprises where the distance of the field is less than 6 km). This sugar beet is weighed at the weighing bridge of the factory, a sample is taken to determine the sugar content and the beet is brought to the beet storage of the factory. There the evaluation of the sugar beet is carried out by the quality checker of the factory and the representative of the grower. The evaluation is carried out on the basis of the Czechoslovak Standard, determining the amount of impurities and admixtures, the quality of the cut-off part, the amount of damaged sugar beet, etc.
  - b) in case that the distance of the harvested field is greater than 6 km, the sugar beet is transported to a Filial weighing bridge of the factory where it is weighed and evaluated according to quality and stored in the beet storage. The sugar beet thus bought is the property of the sugar factory.
2. The transport of sugar beet from the beet storagessis then carried out by the sugar industry at its own costs to the place of processing.

In the South Moravian Region, in the sugar beet seasons of 1985 and 1986, on the average 1584 thousand tonnes of sugar beet were grown and transported into sugar factories. This plant was transported in the region on the one hand along the roads, on the other hand by railway. 1496 thousand tonnes, i.e. 94 %, were transported by road, the rest, 88 thousand tonnes, i.e. 6 % of the total amount by railway. The average transport distance along the road was 16.2 km, along the railway 86.4 km. Most of the sugar beet was transported along the road by ČSAD lorries (Czechoslovak Automobile Transport), altogether 752 thousand tonnes, i.e. 47 % of the amount transported by roads, further by the means of transport of the agricultural enterprises 614 thousand tonnes, i.e. 39 %, and other transport

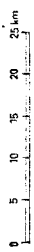
Collecting Areas of Sugar Factories in the South Moravian Region



Collecting Area of Sugar Factory:  
 The Region, where no longer  
 of Beet

- 01 Beřňoš
- 02 Břeclav
- 04 Hodonín
- 05 Hrušovany
- 06 Hulín
- 07 Němčice n.H.
- 08 Slavkov
- 09 Sokolnice
- 10 Uh. Hradiště
- 11 Vrbňák
- 12 Vsetuň
- 13 Vugňkov
- 14 Zidochovice

▲ Sugar Factory  
 — The Boundary of Agricultural Enterprise



4. The Share of Sugar Beet in Arable Land (%)  
 31. Mean Yields for the Years 1984-1986 (t/ha)

Table 1. Transport structure of sugar beet into the individual sugar factories (%)

Factory	ČSAD	Road transport of agricultural enterprises	Other road transport	ČSD (Czechoslovak Railways)
01 Bedihošť	15	85	—	—
02 Břeclav	62	13	1	24
04 Hodonín	67	33	0	—
05 Hrušovany	60	23	3	14
06 Hulín	23	42	35	—
07 Némčice	48	45	7	—
08 Slavkov	46	32	22	—
09 Sokolnice	43	26	22	9
10 Uherské Hradiště	51	47	2	—
11 Vrbátky	9	91	—	—
12 Všetuly	35	56	9	—
13 Vyškov	43	24	33	—
14 Židlochovice	44	54	2	—

by lorries, 8 % transported 129 thousand tonnes. The longest transport distance was that of ČSAD lorries (19.3 km), the shortest the means of transport of agricultural enterprises (13.8 km), — see Table 1.

From Table 1 it is possible to follow the fact that the transport of sugar beet by ČSAD lorries prevails in sugar factories Břeclav, Hodonín, Hrušovany nad Jevišovkou, Némčice nad Hanou, Slavkov, Sokolnice, Uherské Hradiště, Vyškov. Transport by the means of transport of agricultural enterprises prevails in sugar factories Bedihošť, Hulín, Vrbátky, Všetuly and Židlochovice. Other road transport sees to only a small part of the material, taking an important share only in sugar factories Hulín, Slavkov, Sokolnice and Vyškov. By railway sugar beet is transported to only three enterprises of the region, i.e. Břeclav, Hrušovany and Sokolnice.

To make use of the means of transport bringing sugar beet into the factories on their way back, they are utilized for the transport of fresh cuttings to the customer. The agricultural enterprise gets about 52 % of the mass of the supplied sugar beet. In the South Moravian Region the average amount of cuttings transported in the sugar beet seasons of 1985 and 1986 was 707.6 thousand tonnes. Most of the cuttings are transported by the means of agricultural enterprises (360.4 thousand tonnes, i.e. 51 %), further by ČSAD lorries (184.1 thousand tonnes, i.e. 26 %), and other road transport (45.5 thousand tonnes, i.e. 7 %). The railway transported altogether 16 % of cuttings. An important factor in the transport of sugar beet is time. The purchase of sugar beet is, as a rule, finished by the end of November, but the sugar beet season lasts to the end of the year and therefore sugar beet must be stored. During its storage there occur losses in the content of sugar, in the mass, the damaged heads catch rot. Therefore the harvest must be perfectly organized as well as the transport of sugar beet depending on the processing capacities of the sugar factory and on the

Table 2. A list of fundamental indices of sugar factories of the South Moravian Region

Factory	Fundamental standart t/24 h	Purchase t	Length of sugar beet season	Harvested area ha	Mean yield t/ha
Bedihošť	850	67 528	79	1 694	39.77
Břeclav	1600	104 804	67	3 225	33.82
Hodonín	3000	151 773	85	4 319	35.46
Hrušovany n. Jevišovkou	4200	373 952	89	10 399	37.19
Hulín	1050	74 921	71	1 772	41.64
Němčice nad Hanou	1450	102 001	70	2 457	40.59
Slavkov	1160	87 761	76	2 404	35.47
Sokolnice	1200	80 180	67	2 012	37.19
Uherské Hradiště	1670	125 945	75	3 204	39.55
Vrbátky	1170	101 246	86	2 428	39.91
Všetuly	1100	100 797	92	2 623	38.90
Vyškov	1500	109 655	73	2 828	40.32
Židlochovice	950	88 562	93	2 161	41.16
Total	∅ 1607	1 569 125	∅ 79	41 526	∅ 38.51

Average values for the years 1984–1986.

length of the sugar beet season. The stored sugar beet must be protected, which is done by aeration and chemical protection of the stores. Those are fundamental assumptions for lowering the losses in storing the sugar beet.

## CONCLUSION

The fundamental and irreversible assumption for maintaining hitherto economic effects of the production vertical sugar beet — sugar and above all of its considerable improvement is the quick renewal and modernization of the material technical base of the sugar industry. Further delay of starting the renewal and modernization of the sugar industry is in sheer contradiction with the needs of the national economy, as postulated in the resolution of the highest state and party bodies, the more that the low investment inputs in the period after World War II did not even safeguard a mere reproduction. The consequence is the above high physical wear of the fundamental funds, the low productivity of labour and high losses. At present there are 13 sugar factories operating in the South Moravian Region, but most of them were established already at the end of the 19th century, only the sugar factory at Hrušo-

vany nad Jevišovkou was built in 1969. During the time of the operation of the factories there was a great wear and it was necessary to reconstruct them. But the main works at the modernization strated as late as in the 1960s, and there was always only an exchange of some parts of the production equipment. Only in the factory at Hodonín a reconstruction of the whole factory was carried out.

From the map appendix it is possible to follow considerable differences among the individual collecting areas. There arises a question as to which is more effective in the problem of disproportions between the volume of the production and the procession of the raw material. In some regions the production exceeds the possibilities of procession distributed on the territory, in others, on the other hand, the factories are insufficiently supplied from their territory. For that reason, every year a great amount of sugar beet must be transported from other parts, which affects negatively the transport costs and the losses in storage. Another factor of no less importance is also an essential increase in the quality of the fundamental raw material — the sugar beet, particularly increasing the sugar content and the total yield of the refined product per hectare.

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