

THE HUNGARIAN AGRICULTURE AND ITS OUTPUT IN THE 20th CENTURY

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SUMMARY

The author reviews the up and downs of Hungarian agriculture in the context of the overall history of Hungary. After a brief description of the structure of Hungarian agriculture and the socio-economic conditions surrounding it at the beginning of the 20th century, he demonstrates with statistical data the impact of the two World Wars on its productive forces and its output, respectively. He also deals in details with the three crucial politically motivated structural changes influencing Hungarian agriculture. The land reform of 1945, the collectivisation in the 50s and 60s, and the reversal of these in the 90s. Time series on the output of both crop and animal products, mostly covering the whole 20th century, are also presented.

KEYWORDS: Agricultural production; Socio-economic changes.

Hungary is one of the small countries of Europe. The altitude above sea-level of 84 percent of the area is below 200 meters, 14 percent between 200 and 400 meters and only 2 percent is above 400 meters. The natural conditions, the climate, the location, the water supply and the soil conditions provide the opportunity for a level of agricultural production which is above the European average. There were periods in the history of the past 100 years of agriculture when it was the leading sector of the national economy and it provided a level of food supply for the population well above that prevailing in the majority of European countries, and a considerable surplus was sold on export markets. The share of agricultural area in Hungary is the second among the European countries after Denmark. In 1999 the area under agricultural cultivation was nearly 6.2 million hectares, that is, two thirds of the total area. Over 5 million hectares were under field- and horticultural crops. The forest area was nearly 1.8 million hectares (19 percent).

As far as the per capita agricultural area is concerned, Hungary belongs to the group of European countries with the highest rate. It is equal to 61 hectares per 100 heads, compared with the European average of 45 hectares per 100 heads, and ranks fourth after Denmark, Sweden and France by the amount of arable land per head of agricultural population.

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At the beginning of 1999 the population of Hungary was 10.1 million. It has been decreasing from year to year since 1980, though the density (109 inhabitants per square kilometre) is higher than the European average. The rate of people engaged in agriculture compared to the total economically active population exceeded the European average until 1995 and after that it fell below the European average.

SOCIO-ECONOMIC IMPACTS ON AGRICULTURE AND ITS PRODUCTION

At the beginning of the 20th century the holding structure of Hungarian agriculture was dominated by semi-feudal large estates. More than a third of the agricultural area suitable for agricultural cultivation belonged to 4000 landlords who held more than 500 hectares. In comparison with the Western European countries, the development of Hungarian industry and other sectors of economy were retarded, therefore agriculture remained the leading sector of national economy. In contrast to the 8 percent share in England, in Hungary 62 percent of the national income was generated by agriculture in 1913. At that time the level of production increased owing to the consolidated market conditions, though capital investment in agriculture remained insufficient. Despite the favourable natural conditions, productivity of Hungarian agriculture was lower than the European average in the first half of the century. Technical progress was particularly noticeable in the capacity increase of the food industry. The progress was faster in the crop production sector.

The first World War broke the slow progress. During the war agriculture in Europe was shattered due to the damages and increasing lack of labour, production sank below the pre-war level. During the last years of war, agricultural output of Hungary dropped back to half of the pre-war output.

Among the governmental measures to counteract fallback, the agrarian reform of 1920 (involving 660 thousand hectares) was of paramount importance. A total population of 400 thousand smallholders and agricultural labourers received only a small piece of land, and building sites were given to 200 thousand families. Many farmers could hardly pay back the governmental loan, therefore their land was soon put up at auction sales. All in all, the agrarian reform in fact failed to change the semi-feudal estate structure.

The world-wide depression of 1933 hit worst the countries with growing grain, such as Hungary. During the five years of the crisis, prices of crops fell by more than 50 percent. Unmarketable stocks increased to an unprecedented level, debts and unemployment in the agricultural sector skyrocketed. Yields remained at the level typical for those prevailing 20 to 30 years before, yield rates varied depending on weather conditions. State intervention and later war profiteering globally facilitated recovery. Between the two World Wars the ratio of agricultural wage-earners in proportion to the total number of wage-earners in the national economy reduced approximately to the same extent as the share of agriculture was in the total output. World War II brought severe devastation due to the armed battles on the territory of Hungary. The state of affairs was particularly desperate in agriculture, where total losses regardig means of production amounted to 53 percent, or to the double of the agricultural national income in 1938. In the '40s the level of production and food consumption also dropped dramatically, and the share of agricul-

ture in the national income fell below 50 percent. The government established at the end of the war the objective of radically changing land tenure. The parliamentary parties agreed on the dissolution of estates of landlords, churches, businesses and farmers who possessed more than 50 hectares. More than 3.2 million hectares were affected by the agrarian reform, of which 2.9 million hectares were arable land. A total of 642 thousand people received allotments, on the average approximately 3 hectares. The minimum allotment was 0.7 hectares, the maximum 8.6 hectares. Agricultural labourers and landless agricultural day-labourers living on large estates received the largest allotments, nearly 5 hectares each. Smallholders and small farmers received only complementary allotments. Simultaneously with the allotments to individuals, on about 800 thousand hectares state forestries and on about 300 thousand hectares common pastures were established. Size structure of holdings as found by the census of agriculture in 1935 and that after the land reform is shown by Table 1.

Table 1

*Distribution of holdings and land by size
(percent)*

Holding size	1935			1949		
	Number	Total area	Arable land	Number	Total area	Arable land
Smallholdings	72.4	10.1	12.3	45.7	15.0	19.2
Small farms	26.8	41.8	53.1	54.1	55.9	74.4
Medium-size farms	0.7	18.2	14.5	0.2	4.2	5.6
Large estates	0.1	29.9	20.1	0.0	24.9	0.8
<i>Total</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>

The farmers who received new allotments and the other small farmers recovered the war damages in a very short time. The impetus of progress and enthusiasm, however, faltered in the 1950s. Production dropped and in just a couple of years more than 250 thousand farmers stopped cultivation. By the end of 1952 the size of state land reserves amounted to half a million hectares. These lands were re-cultivated after a shorter or longer period of time. Between 1949 and 1952 the area used by co-operative farms trebled, and the area of state farms increased by 40 percent.

Insufficient mechanisation and soil fertilisation were the symptoms of this period. Yield rates dropped, earlier producers who quit agriculture and the farmers hit by the forced state procurement appeared as buyers of agricultural commodities on the market. Between 1949 and 1955 the volume of food imports increased severalfold.

In just three years, between 1959 and 1961, the remaining private farms were integrated into co-operative farms. From the initial 1 million, their number dropped to a mere 200 thousand, their average size fell from 3.5 hectares to 2 hectares.

With the switch to large-scale farming, the majority of assets which suited small-scale farming became useless, and huge state subsidies were required for capital investment. The net effect was an unprecedented growth in the volume of production, and Hungarian agriculture achieved development rates remarkable even by international measures. Over several years the average annual rate of growth exceeded 4 per-

cent. After 1970, the rate of growth and share of animal husbandry exceeded those of crop production. Especially, the growth of livestock feeding on grains was extraordinary. These achievements were mainly attributable to the evolving purposive co-operation of fifteen hundred large-scale agricultural plants and one and a half million small-scale agricultural producers.

As a result of the impacts of the world economy and the domestic fiscal pressure, the impetus of this development faltered by the 1980s. A symptom of perplexity of the large-scale plants was the expansion into non-core businesses, such as repair of agricultural machinery, processing, transportation, trade and hostelry. This process started in the '70s, and later the non-agricultural business lines were spun off into separate plants. In the second half of the '80s non-core businesses became significant generators of profit. After 1990 non-core activities in agriculture gradually dropped off.

After 1989 the revindication of holdings began in the framework of a so-called compensation scheme, and the process of land privatisation accelerated. A part of the cultivable area of large-scale agricultural plants was devoted for compensation. The land fund thus created was used to allot holdings to eligible persons against compensation coupons. Bidding for land was open for the members of co-operative farms involved and local dwellers. The process of compensation continued until the mid '90s, and by mid 1994 approximately half a million persons received a total of 2 million hectares through auction.

Part of the co-operative farms was liquidated, another part was converted into smaller co-operatives, and some of them carried on the business on land leased from the owners under the new ownership conditions. The majority of state farms were incorporated, the rest was dissolved.

For changing the ownership of agriculture, the financial and structural conditions of production were anything but satisfactory. Apart from the protracted process of allotment, the dropping value of compensation coupons and the excessive price increase of industrial inputs, the drought in several consecutive years also contributed to the aggravation of production conditions. The fundamental problem was the failure of attempt to find a solvent demand for agricultural goods on export markets. Eastern markets had solvency problems, the western ones were saturated, and occasionally the quality, packaging, etc. of Hungarian goods was deterrent for prospective clients. The privatisation and fragmentation of foreign trade also aggravated the situation.

Due to the described factors, the willingness and enthusiasm of newly allotted farmers did not equal those of farmers in 1945. Other problems, such as the age and health conditions of new land owners and the lack of funding contributed to the failure of creating a thriving farming, therefore the landowners rather sold or leased out their parcel. In 1994 the area of leased land was almost 1 million hectares. Thus, land ownership and land use have become considerably disconnected.

Land use and ownership

In the first half of the century land ownership and land use mostly overlapped, though starting from the 1950s the leasehold of land somewhat restructured the picture. After the institution of co-operative farmship, titles of use and sanctioned areas changed on a number of occasions.

Table 2

Distribution of the agricultural area by type of use
(percent)

Year	Share in the total agricultural area		
	State farms	Co-operatives	Small-scale producers
1960	12.1	48.6	32.1
1965	13.0	66.9	16.8
1970	12.8	67.6	17.1
1975	12.6	70.7	14.3
1980	12.7	71.4	13.2
1985	12.4	71.8	13.2
1989	12.0	70.3	14.9
1990	11.9	67.6	17.6

In the '50s the regulations relating to land use targeted mainly the consolidation of socialist ownership. By the nationalisation of land, its trading terminated. The co-operative farms could increment area from two key sources. Over one quarter of the increment originated from agricultural reserve land, and the members contributed the rest. A land-rent depending on the size and quality of land contributed was paid to the members of co-operative farms. Their general meeting determined each year the invariably increasing amount of land-rent payable to members.

Small farms were cultivated mainly by people as a subsidiary activity, complementing their main occupation. Small farms involved in animal husbandry received or bought forage from the large-scale estates. A peculiar distribution of work evolved between small-scale producers and large-scale plants in land use. Small farms specialised mainly on labour-intensive production such as horticulture, whilst the large-scale plants specialised on crop requiring high level of mechanisation, such as grains.

Due to the ban on the trade of land, it had no realistic value since 1945, and the lack of a well-developed market affected farming in a number of ways. Land did not represent a measurable value in national assets. In the trade of land among large-scale farms unrealistic and fictitious prices were used, and land was mostly swapped or offset in the books through a fictitious transaction. Apart from the building sites, private parcels were allowed to be offered to the large-scale farms only. Suppressed land prices finally resulted in squandering, the quality and agricultural potential of soil was disregarded in the construction of non-agricultural facilities. Land prices are still too low, and typically amount to a mere fraction of the same in the EU-countries.

Changes in the agricultural area by main land use branches

The amount of the cultivable agricultural area changed in various directions in the last century. In a degree exceeding the reasonable level agricultural areas were used typically for the construction of infrastructural facilities in certain periods of time. This process and the intensive forestation at the expense of cultivable areas has significantly reduced agricultural areas.

Table 3

Area by the main land use branches
(thousand hectares)

Year	Cultivable land	Agricultural land	Arable land	Forests	Grass land	Kitchen gardens, orchards, vineyards
1895	8678	7439	5103	1191	2066	270
1913	8698	7573	5578	1069	1683	312
1930	8702	7566	5587	1095	1669	321
1940	8698	7553	5617	1099	1603	331
1950	8573	7376	5518	1166	1475	383
1960	8494	7141	5310	1306	1438	393
1970	8402	6875	5046	1471	1281	575
1980	8300	6627	4735	1610	1281	598
1990	8236	6473	4713	1695	1294	598
1999	8035	6186	4708	1775	1186	331

CROP PRODUCTION

The climatic conditions of Hungary allow the production of an extremely large variety of plants. The conditions and the market demand, however, justified the development of field crop production in the first place. The bulk of horticultural production comes mainly from three horticultural branches: the vegetables, fruits and the grapes. A large number of household garden are producing mixed crop contributes to the supply of vegetables and fruits for the Hungarian population. Grass land is mainly concentrated in areas of poor conditions. The diminishing ruminant livestock also contributed to the reduction of its area. Most of the remaining area is under forests, and to a much lesser extent under reed-plots and fish-ponds.

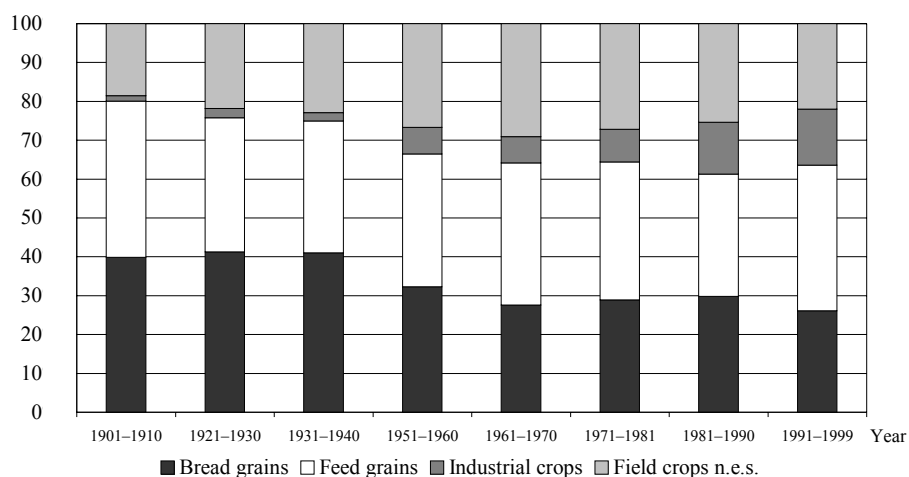
Production of field crops

At the beginning of the 20th century the choice of crops produced was rather narrow. The number of varieties has considerably extended in the last hundred years. More than three quarters of arable land was under cereals in the 1990s, and only some forage crops and potatoes were cultivated on a relatively significant area. Later on, the area under bread grains reduced, specifically the area under cereals dropped to the two thirds at the expense of the increasing sown area of maize. The most intensive was the incursion of industrial plants and vegetables the sown area of which increased to severalfold. In the past 60 years the land starchy plants have always been the most popular crop, and there was hardly any progress in the field production of fodder. Due to the frequent droughts in summer, the yield of grass land has been a limiting factor for breeding of ruminants (see Figure 1.).

Wheat is the field crop occupying the largest sown area in Hungary. At the beginning of the century wheat was grown on nearly 40 percent of the arable land. Before World War I, one third of the crop was exported in the form of grain or flour. After the peace treaty protective duties were lifted, and the succession states of the Monarchy stopped buying Hungarian wheat. As a consequence, wheat price on the domestic

market was very low in the 1920s, and then in the years of global depression it dropped another 50 percent. The price of wheat achieved the 1913 level only by the end of the 1930s.

Figure 1. Area sown by crop categories
(percent)

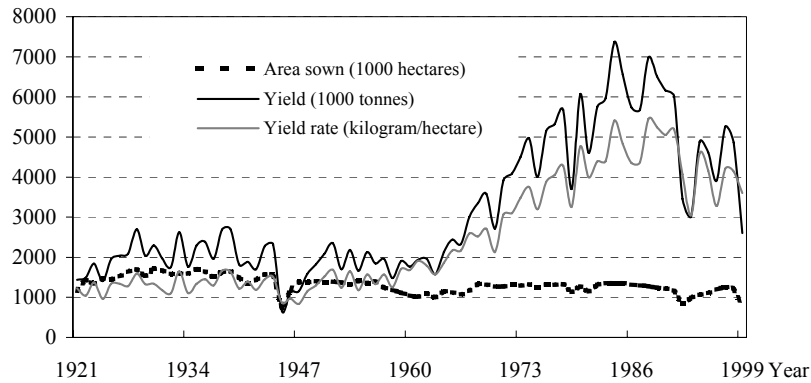


The utilization of wheat crop changed in the 20th century. Earlier most of the crop was milled for human consumption, but in the last 30 years it has been more commonly used as fodder. From 1934–1938 to 1998 the per capita consumption of wheat products significantly reduced, from 145 kg to 80 kg.

The gluten content of wheat improved over the past century. The unfavourable assortment of wheat of the 1920s called for the introduction of new, modern varieties such as Bánkúti, Székács, Fleischmann. With the advent of machine harvesting the tall varieties with a delicate straw were ousted by Italian, Soviet, Yugoslav, and later, ameliorated Hungarian varieties in the 1960s, including some forage wheat varieties, too. The majority of wheat varieties produced in Hungary are of winter type; the 20-30 thousand hectares of spring varieties has been reduced to a very small area. Durum wheat has been produced since the 1980s on a relatively small area. Despite the reduction of area sown the output of wheat increased to severalfold, as a consequence of improving yield rates. The largest amounts were harvested in the 1980s (see Figure 2.).

At the beginning of the century most of the spring barley was used in the brewing industry, and the output of winter barley used as a forage was rather low. In the 1960s the sown area of winter barley started to exceed that of the spring barley, because the yield rate of the former was considerably higher. The sown area reached its peak in the 1960s, sometimes even exceeding half million hectare. In the following years, however, it almost halved, and in the 1990s it started to grow again. In the first half of the century yield rate varied to a great extent between low limits, while after 1960 it doubled. Yield rate stabilised in the 1990s at a slightly lower level. From the 1920s to the 1990s output of barley increased from 5-600 thousand tonnes to 1.3 million tonnes.

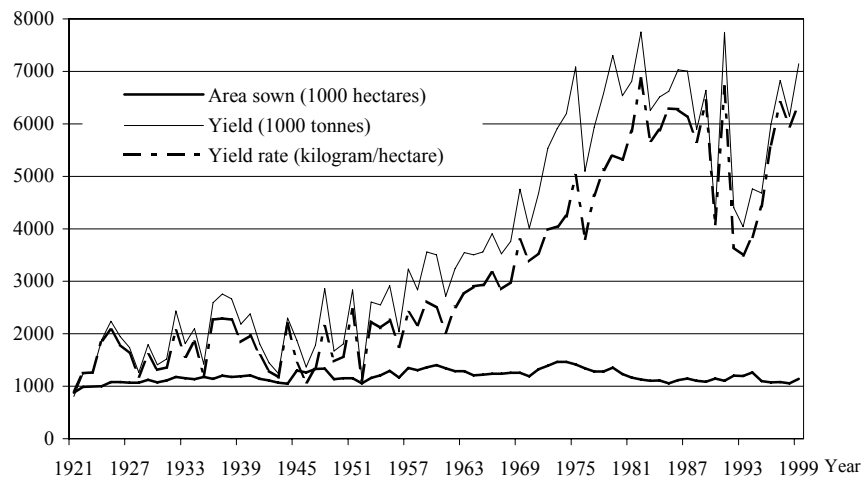
Figure 2. Wheat production



With the reduction of horse breeding the sown area of oats reduced to one fifth between 1920 and 1980. In the 1990s this trend stopped and the sown area was stabilised at a level above 50 thousand hectares. During 80 years its yield rate doubled. The total output was around 130 thousand tonnes in the last decade.

Along with wheat, maize has been the most important crop playing an important role in the feeding of all animal breeds, particularly poultry and pigs. Only a very small amount is used for human consumption. Apart from the grain, maize is also grown on large areas as a fresh fodder. At the beginning of the 20th century the sown area of maize was second to that of wheat, since then in some years it even exceeded the latter. The output has been prone to wide variations. After 1960 the yield per hectare exceeded 2.5 tonnes, and in the 1980s 6 tonnes. This notable growth is explained by the spreading of hybrid varieties of maize. Since 1975 maize output exceeded 7 million tonnes in several years. The volume of maize export has remained below that of wheat.

Figure 3. Maize production



The production of sugar beet provides the raw material for the sugar industry, with a rather large quantity of by-product used as a valuable forage and soil ameliorating material. In the first half of the 20th century the new sugar mills significantly contributed to the increase of sugar beet production. Later on crop output stabilised at a relatively even level. Due to the reducing demand in the recently restructured sugar industry, sugar beet production has also diminished.

Table 4

Changes in rye, barley, sunflower and potatoe production

Average of years	Harvested area (1000 hectares)	Total production (1000 tonnes)	Average yield (kilogram/hectare)	Harvested area (1000 hectares)	Total production (1000 tonnes)	Average yield (kilogram/hectare)
		Rye			Barley	
1921–1930	660.2	712.2	1 080	444.2	543.9	1 220
1931–1940	634.1	711.8	1 120	464.4	628.0	1 350
1941–1950	546.6	593.3	1 070	461.4	576.0	1 260
1951–1960	432.6	506.8	1 170	458.5	784.8	1 710
1961–1970	214.8	239.2	1 120	453.3	904.2	2 000
1971–1980	96.8	153.0	1 580	258.8	792.6	3 070
1981–1990	84.8	184.2	2 070	270.0	1 059.6	3 920
1991–1999	69.8	137.4	1 968	386.5	1 286.3	3 328
		Sunflower			Potato	
1921–1930	2.2	7.6	170	264.3	1 710.7	6 470
1931–1940	6.1	9.4	570	290.4	1 993.1	6 860
1941–1950	143.8	124.7	870	278.8	1 762.8	6 360
1951–1960	151.5	163.9	1 090	227.6	2 196.4	9 620
1961–1970	100.7	103.2	1 040	189.1	1 696.8	9 150
1971–1980	149.9	221.8	1 410	98.3	1 584.1	12 990
1981–1990	338.0	684.1	2 000	46.2	1 353.8	17 980
1991–1999	455.0	737.5	1 621	56.1	976.8	17 403

In the first half of the century sunflower was mainly grown as an edge crop. Later the production method changed and better varieties were grown. With the changes in the consumption pattern and the severalfold increase of vegetable oil and margarine consumption cash cropping of sunflower started to spread in the 1960s. In the last three decades both the sown area and the crop output multiplied. In 1999 the sown area exceeded half million hectares, thus sunflower ranked number three among field crops by the size of the sown area.

The importance of potato in human nutrition, in industry and as a forage has gradually reduced over the 20th century. In the first half of the 20th century the per capita potato consumption of the population was around 110 kilogram. By the 1990s this figure reduced gradually to 60 kilogram. By the 1990s the amount of crop harvested stabilised at around 1.1 million tonnes, though in the earlier years it was as high as 2 million tonnes.

With the introduction of new potato varieties the crop per hectare increased severalfold, but even so it could not offset the drastic reduction of crop area.

Tobacco is a plant grown on a small area in Hungary. In the earlier years the sown area varied between 15 and 40 thousand hectares, and by the 1990s it dropped below the earlier minimum level to approximately 6000 hectares.

Among the field roughages green maize (as silage) is the most important. As far as cattle breeding is concerned, alfalfa plays an outstanding role. In the past decades yield rate of green corn has generally grown, and that yield rate of alfalfa almost stabilised at a certain level. After the temporary growth of the 1960s, the area under roughage reduced in the past decade. The area and yield of grass land gradually reduced over the century. The best meadows were broken under field cultivation, while part of the pastures were afforested.

Despite the favourable conditions the development of vegetable production started only after the turn of the century. More and more varieties were added to the choice of vegetables. At the beginning vegetable production spread in the suburbs of large towns in market gardens, and only later did production on arable land become typical. In the first half of the 20th century specialised horticultural areas evolved, such as Szeged and Kalocsa for paprika (red pepper), Makó for onions and certain districts of Heves county for water-melon. After World War II vegetable production continued to increase. The area and output of vegetables doubled. State farms and co-operative farms specialised on vegetable varieties suitable for mechanisation such as tomato, string beans, green peas, sweet corn, etc. In the past few years layered vegetable production adopted in the 1960s, dropped.

Fruit production

Except the relatively small number of developed orchards, there was hardly any specialised fruit production at the beginning of the century. The number of fruit trees was rather high up to the end of the 1960s, but the amount of fruits was insufficient and the quality was low. In the first half of the 20th century fruit growing districts specialising first on apricots and later on peaches evolved gradually between the rivers of Danube and Tisza, and also on the hills around Buda. New varieties and state-of-the-art cultivation methods were adopted. Later on the cash cropping of apples developed, using an ever increasing area. After World War II fruit growing renewed at around 1965, when modern fruit varieties were come in, new methods of plant protection and agricultural engineering were used. Many worthless fruit trees were felled and new plantations were established. After 1970 the initial enthusiasm faltered, and no new trees replaced the felled ones. Nonetheless, the crop output increased because of the intensive cultivation method employed in the new plantations and the increased yield of the fruit trees. In the 1990s the amount of crop gradually reduced. In the decades after 1960 the production of berries, such as raspberry, gooseberry, red-currant, blackberry, etc. first increased then a downward trend was observed in the last decade. The amount of fruits produced in the household gardens is quite significant, but it is important primarily in the household consumption and in the supply of local markets.

In the decade around the turn of the century, the historical viticultural districts of Hungary suffered severe damages due to the phylloxera epidemics. Vineyards were re-established with governmental subsidies, therefore the vineyards and the wine production

of Hungary underwent a radical change. New varieties resisting to phylloxera replaced the old ones, but the vineyards on hill tops were not re-established, the new plantations were preferably located on lower hills. At this time large vineyards were planted in the Great Hungarian Plane, particularly between the Danube and Tisza rivers. The area of historical viticultural districts diminished. From the 1910s area of the vineyards was around 200 thousand hectares. After 1960 the old vine plantations were replaced by new ones of modern cultivation method on high cordon. The new vineyards were already of high-yield modern variety. After 1980 the area of vineyards nearly halved. In the 1990s plantations became highly fragmented. The share of table grapes in the annual vintage is less than 10 percent. Most of the grapes harvested is used for wine making.

ANIMAL HUSBANDRY

At the beginning of the 20th century animal husbandry developed together with the progress of farming, urbanisation, increase of the middle-class population and living standards. The domestic demand for meat, animal fat and dairy products was continuously increasing, along with their exports to Austria and the Czech lands under protective duty. This was the time when Hungarian meat and dairy industry matured.

The main objectives of animal husbandry at the turn of the century were the completion of selective breeding, adoption of new breeds and replacement of the domestic races with new ones of higher productivity. State-of-the-art methods of livestock breeding became popular. The 3 to 6 percent increase of livestock was less than modest in comparison with the 37 percent increase of the population from the turn of the century to the beginning of World War II. This is explained by various epidemics causing significant mortality. As a consequence, the Hungarian veterinary service was strengthened.

For the 1920s and 1930s stagnation of livestock, increasing inbreeding and attempts to improve product quality were the most characteristic traits. As a consequence of selective breeding the breeding and fattening time and the age of breeding fitness reduced. During the war boom of the 1940s the livestock also increased. World War II brought severe damages, but the livestock regenerated in a few years time.

From the mid '60s increase in crop production allowed the feeding the livestock far larger than the one before war. The increasing export and domestic consumption contributed to the dynamic growth of livestock and the output of key animal products. First the production of meat increased to the level of the Western European countries. By mid 1960s the pig, poultry and sheep stock doubled in comparison with the pre-war level. Nevertheless, through the adoption of cattle breeds with high milk yield, the cow stock, which hardly exceeded two thirds of the pre-war level provided nearly the double of the amount of milk by the first half of the 1980s than in the 1950s.

In the 1980s the earlier growth of agriculture faltered, and concurrently with this, the increase of livestock stopped too. In 1990 the cattle stock reduced by nearly 20 percent, the cow stock by 15, the sheep stock by 40, the poultry stock by 30 percent, and pig stock stagnated in comparison with 1980. In the 1990s further drastic reduction of stock and production took place, and the stock of some animal breeds dropped below the extremely low post-war level.

Cattle-breeding

Apart from the post World War II and recession periods, from the mid 1980s the cattle stock of Hungary did not change significantly over the past century. The relative stagnation of livestock is shown by the fact that it increased till the outbreak of World War I by 100-150 thousand heads from the two-million level at the turn of the century. Then it was around 1.8 million in the period between the two world wars and due to the war boom again increased to 2.4 million. In 1945 Hungary's cattle stock was 1 million 59 thousand heads, a mere 57 percent of the pre-war level. In the following 30 years the stock of cattle remained around 2 millions, with a very low volatility. The reduction of stock in excess of 10 percent in the 1980s, was followed by a drop after the turn of the millennium, when the stock nearly halved. From 1994 the cattle stock of Hungary is less than 1 million heads.

Table 5

The cattle-stock in Hungary

Year	Cattle, total	Of which cows	Cattle, total	Of which cows	Share of cows, percent
	thousand heads		Index: 1980 = 100.0		
1895	2062	728*	105.2	95.8*	35.3*
1911	2185	890	111.5	117.1	40.7
1938	1872	915	95.5	120.4	48.9
1942	2363	1 011	120.6	133.0	42.8
1950	2222	1 063	113.4	139.9	47.8
1960	1971	879	100.6	115.7	44.6
1970	1933	738	98.6	97.1	38.2
1980	1960	760	100.0	100.0	38.8
1990	1637	639	83.5	84.1	39.0
1999	857	399	43.7	52.5	46.6

* Including heifers of at least 3 years age.

After the integration of private farms into co-operatives at the beginning of the 1960s the majority of the cattle stock was bred on large-scale farms. By 1963 state farms and co-operative farms held 53,4 percent of the total cattle stock.

In the 1990s cattle stock of co-operative farms reduced most significantly, and by the end of the decade it fell to the quarter of that in 1986. Nevertheless, co-operatives still hold more than one third of the total stock. Most of the stock was slaughtered (see Table 6.).

At the turn of the century the first significant change of the cattle stock by species took place. The Hungarian piebald cattle of triple use (meat, milk, draught) was a result of cross-breeding at the end of the 19th century of the austerely Hungarian grey breed of high draught power and low milk yield with the Simmenthaler variety imported from Switzerland. In 1869, 92 percent of the stock, and in 1895 nearly two thirds of the stock consisted of the Hungarian grey breed. As a result of the gradual change of the species by 1911 nearly two thirds of the stock was Hungarian piebald, and in the period between the two world wars their share increased to 80 percent, whilst the share of the Hungarian grey breed dropped to a mere 10 percent.

Table 6

*Cattle stock by types of holdings**

Year	Farming companies and businesses	Co-operative farms	Private holdings	Total
Thousand heads				
1976	273	1074	540	1887
1986	332	1058	335	1725
1992	280	611	268	1159
1994	253	415	242	910
1999	288	268	301	857
Percent				
1976	14.5	56.9	28.6	100.0
1986	19.2	61.3	19.4	100.0
1992	24.2	52.7	23.1	100.0
1994	27.8	45.6	26.6	100.0
1999	33.6	31.3	35.1	100.0

* December figures.

The next significant change by species in cattle breeding began in the 1970s. From the 1960s the need for the draught power of the Hungarian piebald reduced, and after nearly 20 years of stagnation, milk production became one of the critical issues of agricultural policy.

The profitability problems of this branch forced the policy makers and the cattle breeders to replace the Hungarian piebald breed with modern races of high milk yield, and to cross-breed the existing cattle stock with this objective in mind. The Holstein-Friesian race played an important role in the change by species.

Table 7

Distribution of cattle-stock by species
(percent)

Year	Cattle, total	Of which:			
		Hungarian grey	Hungarian Piebald and Simmenthaler	Holstein-Friesian and cross-breeds	Other
1942	100.0	9.4	83.4	—	7.2
1949	100.0	7.8	78.9	—	13.3
1982	100.0	.	32.7	67.3*	.
1987	100.0	.	32.9	53.1	14.0

* Including cattle for slaughter and other breeds.

Output of cattle-breeding varied throughout the century. Beef cattle production dropped by a significant extent. The milk yield of cows showed an increasing tendency and doubled in the last 30 years. In comparison with the first half of the 1970s the milk yield per cow doubled by the end of the 1980s. Due to the reduction of the cow stock, however, the total milk production of the last 10 years has also dropped.

Table 8

Output of animal product of cattle

Year	Beef cattle production (thousand tonnes)	Cow milk production (million litres)	Milk yield per cow * (litre)
1895	–	610	830
1938	141	1525	1586
1950	195	1403	1424
1960	250	1899	2190
1970	324	1807	2420
1980	331	2471	3596
1990	250	2763	4935
1999	96	2011	5311

* Milk sucked out by calves is included.

The recession of milk production was partly due to the reduction of solvent demand and partly to lacking motivation of domestic and foreign owners of the privatised milk industry after the termination of government subsidies.

Beef cattle output diminished mainly because the procurement prices did not keep abreast with the increasing production costs, while beef consumer prices increased to severalfold. As a consequence of low profitability, cattle breeders were counter-motivated in maintaining, let alone increasing cattle stock.

Pig breeding

Pig breeding in Hungary is the dominant branch of domestic animal husbandry. In the 1980s its share was nearly 40 percent of the gross output of animal husbandry. In 1895 the domestic pig stock (converted to the current territory of Hungary) was 3 million 180 thousand heads. By the beginning of the 20th century the increasing demand on meat and animal fat of the dynamically growing population could be satisfied in a short time only by the massive development of the pig stock producing large amounts of meat and fat. The pig stock increased by 5-6 percent annually until the break-out of World War I. Between World War I and World War II the pig stock varied between 4 and 5 million heads (according to the seasons and cycle).

The significant losses of the pig stock due to World War II were recuperated by 1949, when the stock was equal again to the pre-war level. Neither government measures at the beginning of the 1950s, nor the integration of private farms into large-scale farms in the years between 1959 and 1961 prevented the increase of pig stock.

As a consequence of the boom on the Eastern European markets, and the virtually unlimited demand, the Hungarian pig stock increased to 8 million in the second half of the 1970s, and at the beginning of the 1980s the stock counted at the end of September exceeded 10 million. From 1985 the pig stock was consciously cut down through restrictive government measures. In the 1990s pig breeding evolved into a fragmented branch, exposed to ad-hoc decisions and haphazard impacts.

The number of sows, particularly that of the first farrowing ones, is directly related to the change in the farmers' willingness to breed pigs. When the farmers are motivated, the

number of first farrowing sows increases, and vice versa, the farmers first slaughter the sows and breed no first farrowing sows whenever motivation is low.

Table 9

Pig stock, 1895–1999

Year	Pigs, total	Of which breeding sows	Pigs, total	Of which breeding sows	Breeding sows as percentage of total
	Thousand heads		Index: 1980 = 100.0		
1895	3180	536	37.1	75.7	16.9
1911	3352	560	39.1	79.1	16.7
1935	4674	602	54.5	85.0	12.9
1942	4667	613	54.5	86.6	13.1
1950	5542	638	64.7	90.1	11.5
1960	5356	409	62.5	57.8	7.6
1970	5970	535	69.7	75.6	9.0
1980	8570	708	100.0	100.0	8.3
1990	8457	768	98.7	108.5	9.1
1995	4669	443	54.5	62.6	9.5
1999	5335	379	62.3	53.5	7.1

For the continuity of meat production and sales the most favourable condition would be if the pig stock did not change. Due to economic and biological reasons, the pig stock is subject to seasonal and cyclic changes. Traditionally seasonal changes take place due to the fact that the pig stock achieves the maximum level in the fall. As a consequence of the peak of household slaughters in the winter months, the minimum level of stock is measured at the end of the year. In the 1980s stock reduction in the period between September and the end of December was 1.0-1.3 million, i.e. 10-15 percent.

Apart from the seasonal fluctuation, pig breeding is subject to multi-year market cycles. The prices of pig for slaughter and fodder, and their ratio significantly impact the willingness of pig breeders, particularly those producing for sales in smaller quantities. With increasing profitability many people venture into pig breeding and fattening, and vice versa, at faltering profitability they either reduce the stock or stop breeding at all. Farmers massively respond to price variations with only a minor delay. First the sow stock increases or reduces then the total pig population changes in the similar direction.

The precondition of a stable level of pig stock is the consolidation of the profitability of pig breeding and fattening. Along with the smooth supply of fodder this can be achieved if the pigs offered at the peak of the cycle are purchased from a special intervention fund. Thus one can maintain market demand and prevent prices from dropping. At the lowest point of the cycle, however, pig breeders have the option to buy store pigs at subsidized prices. Thus one can prevent the significant reduction of pig stock from and the sudden increase of market prices. The experience of the 1970s and 1980s has proven the feasibility and pertinence of this method.

At the turn of the century a significant varietal change took place in the composition of Hungarian pig stock by species. The most popular of the heterogeneous stock composed of Bakony, Szalonta, Polish and 'mangalica' breeds was the last one of lard type.

This composition of stock was mainly due to the growth of maize production and the increasing demand on lard and pig fat. The meat varieties of pigs gained ground slowly. Even by 1948, the share of meat pigs remained around 30 percent. The varietal change accelerated only in the 1950s, therefore by 1962 more than 60 percent of the pig stock were meat pigs and a third consisted of crossbred stock. At that time the share of lard pigs fell below 6 percent of the stock.

From the 1970s the hybrid-pigs became popular, primarily in the large-scale farms. The most popular breeds were the KA-HIB and HUNGA-HIB hybrids. In 1972 less than one fifth of the Hungarian pig stock were hybrid pigs, but this share increased to 50 percent in 1991.

Change in composition by species is, of course, an on-going process, but the complete ousting of lard breeds can be considered final. The markets, particularly the export markets demand new races and hybrids with a reduced breeding time and age at the start of breeding, increased accretion at births and lower age at slaughter. With the varietal change the veterinary condition of the pig stock significantly improved. By the mid 1980s the pig stock was practically free of the three most severe pig diseases, which otherwise had been the precondition of selling Hungarian pigs and pork products on the most demanding markets.

In the 90s the production of pigs for slaughter significantly dropped along with the main performance indices of pig breeding, such as mortality and accretion rate.

Table 10

<i>Key indices of pig production</i>				
Year	Pigs for slaughter (thousand tonnes)	Accretion per sow at the beginning of the year (heads)	Mortality (percent)	Pig for slaughter per sow at the begin- ning of the year (kilograms)
1989	1317	19	9.2	1968
1990	1290	21	8.7	2065
1992	947	18	10.3	1963
1994	749	16	9.3	1784
1996	838	20	9.8	1923
1998	710	21	9.3	2056
Index: 1989 = 100.0				
1989	100.0	100.0	100.0	100.0
1990	97.9	110.4	94.6	104.9
1992	71.9	94.2	112.0	99.7
1994	56.9	87.5	101.1	90.7
1996	63.6	103.6	106.5	97.7
1998	53.9	109.9	101.1	104.5

Poultry breeding

At the turn of the century poultry breeding was a neglected branch of animal husbandry. Though Hungarian cuisine never lacked poultry, hardly any statistical informa-

tion on the poultry stock is available from this period of time. Poultry meat, egg and quill production played an important role in the everyday life, as meals and income for generations of the peasant population. (Peasants constituted a determinant stratum of the Hungarian population with a 56 percent share in 1920, and still above half of the population 10 years later.) In 1935 ninety percent of the poultry stock was held by farms below 100 cadastral yokes (58 ha), 71.8 percent, on small farms below 20 cadastral yokes (12 ha). Foreign trade became more and more important. Exported poultry products amounted to 10-12 percent of total Hungarian exports, 18 to 20 percent of agricultural exports and 30-35 percent of exports of the animal husbandry branch. In 1938 one-fifth of the live weight of animals for slaughter was meat poultry.

The majority of hens held under extensive conditions were of the traditional native breed of small size and low egg yield. From the 1930s on the agricultural administration made attempts to ameliorate the native breeds and adopt imported breeds for the utilisation of export possibilities. The destruction brought by World War II was recovered in a rather short time. By 1949 the poultry stock exceeded that of 1938. In the fifties the stock of hens further increased and by 1965 it was nearly the double of the 1938 level. The stock of other types of poultry changed to only a small extent.

Table 11

<i>Poultry stock (adult stock in spring)</i>					
Year	Gallinaceous birds	Geese	Ducks	Turkeys	Total
Million heads					
1938	14.5	1.5	1.4	0.3	17.7
1950	16.1	1.0	0.9	0.2	18.2
1955	20.7	0.9	1.0	0.2	22.8
1960	25.3	0.9	0.7	0.2	27.1
1965	28.2	0.9	1.5	0.3	30.9
Index: 1938 = 100.0					
1938	100.0	100.0	100.0	100.0	100.0
1950	110.3	66.7	75.0	56.6	103.2
1955	141.5	59.7	86.3	72.5	129.5
1960	172.8	60.9	60.1	64.4	153.6
1965	193.3	60.6	128.2	88.8	175.7
Percent					
1938	82.9	8.5	6.8	1.8	100.0
1950	88.5	5.5	5.0	1.0	100.0
1955	90.5	3.9	4.6	1.0	100.0
1960	93.2	3.4	2.7	0.7	100.0
1965	91.2	2.9	5.0	0.9	100.0

A significant contribution to the increase of the stock and production of gallinaceous birds was that the political mismanagement of the fifties had no impact on poultry breeding, and – in contrast to other animal races – breeding was not limited by breeding or slaughtering restrictions. The continuous increase of the stock of gallinaceous birds was

largely due to the fact that this type of breeding fit very well the large-scale production evolving at that time, because the highest return on investment could be achieved specifically in this branch at a relatively smaller initial investment. As a result of new technologies the poultry meat production of Hungary exceeded the pre-war level by 50 percent by the completion of integration of farms into large-scale plants, that is, by year 1965. At the same time hen egg production increased by 250 percent in comparison with 1934–1938. The egg yield per laying hen increased to 85-90 annually, which was 30-35 percent higher than the egg yield before World War II.

By the beginning of the 1970s the large-scale farms adopted industrialised production methods, therefore the composition of poultry stock by breeds changed to a significant extent. The stock of gallinaceous birds and turkeys doubled, the goose stock nearly trebled.

Table 12

<i>Poultry stock (adult stock in December)</i>					
Year	Gallinaceous birds	Geese	Ducks	Turkeys	Total
Thousand heads					
1965	27 627	648	716	218	29 209
1970	32 880	750	1 310	157	35 097
1975	36 549	611	1 275	232	38 667
1980	40 040	778	1 723	223	42 764
1985	34 780	1 077	1 929	590	38 376
1990	28 407	883	1 420	411	31 121
1995	24 961	888	1 134	566	27 549
1999	18 317	745	1 790	674	21 526
Index: 1965 = 100.0					
1970	111.8	71.8	70.2	74.3	108.2
1975	129.5	67.2	82.9	81.7	125.0
1980	141.9	85.6	112.0	78.5	138.2
1985	123.3	118.5	125.4	207.8	124.0
1990	100.7	97.1	92.3	144.7	100.6
1995	88.5	97.7	73.7	199.3	89.0
1999	64.9	82.0	116.4	237.3	69.6
Percent					
1965	91.2	2.9	5.0	0.9	100.0
1970	94.2	2.0	3.2	0.6	100.0
1975	94.5	1.6	3.3	0.6	100.0
1980	93.7	1.8	4.0	0.5	100.0
1985	90.6	2.8	5.0	1.6	100.0
1990	91.3	2.8	4.6	1.3	100.0
1995	90.6	3.2	4.1	2.1	100.0
1999	85.1	3.5	8.3	3.1	100.0

The economic stagnation which started in the mid 1980s, hit the stock of gallinaceous birds only. This stock reduced by 27 percent in the mid '80s was mostly bred by small-scale producers. The duck stock stagnated. On the contrary, the stock of geese held primarily in large-scale plants increased in comparison with 1980 by nearly 90 percent, and

the stock of turkeys by 60 percent. In the period from the beginning of the 1980s to the end of the decade the share of gallinaceous birds in the total poultry stock decreased from 94-95 percent to 90 percent. At the end of 1990 44 percent of the stock of gallinaceous birds including 26 percent of the laying stock, 56 percent of the geese, nearly 90 percent of the turkey stock and less than a quarter of ducks were in the ownership of large-scale agricultural plants.

Meat poultry production stabilized at a relatively high level, egg production and the stock of laying hen reduced and further dropped, though the egg yield per hen has improved.

Table 13

Poultry product output

Year	Meat poultry (thousand tonnes)	Hen eggs (million pieces)	Egg yield per hen (pieces)
1965	200.7	2392.8	92
1970	280.7	3280.0	113
1975	354.9	4001.0	144
1980	464.2	4384.7	138
1985	529.0	4228.0	152
1990	591.8	4679.1	188
1995	510.0	3467.0	191
1999	515.0	3200.0	203
Index: 1965 = 100.0			
1970	139.9	137.1	122.8
1975	176.8	167.2	156.5
1980	231.3	183.2	150.0
1985	263.6	176.7	165.2
1990	294.9	195.5	204.3
1995	254.1	144.9	207.6
1999	289.4	99.8	220.7

Sheep breeding

The prime of Hungarian sheep breeding was in the middle of the 19th century. By the end of the century the overseas breeders flooded the European markets with cheap wool of high quality, and the gradual reduction of the area of pastures also contributed to the significant reduction of sheep stock in Hungary. In 1895 it fell to 3151 thousand heads, which was by 4 million less than the stock in the 1870s. At the turn of the century and even in the years between World War I and World War II sheep were primarily bred for the wool. In the 1930s the government made efforts to increase sheep milk production. By some estimates approximately 50 percent of the ewe stock was milked in the mid 1930s.

Sheep breeding has always been typical for the large-scale farms, that is, manors in the pre-war years. More than 52 percent of the Hungarian sheep stock was bred on estates larger than 1000 cadastral yokes (576 ha). The fact that the sheep stock did not increase at the expected rate in the years between World War I and World War II is ex-

plained primarily by the significant reduction of the pasture areas of large-scale farms, at the expense of the corn-growing areas and the propagation of industry.

During World War II 80 percent of the sheep stock was either slaughtered or driven away. At the end of the war, in May 1945, the remaining stock was less than 330 thousand heads. There was a fast build-up of sheep stock after the war, and by 1950 it was as high as 1049 thousands amounting to 60 percent of the stock in 1942. In the 1970s and 1980s the breeding concentrated mainly on sheep for slaughter, particularly paschal lamb. By the mid 1980s marketing of paschal lamb increased by 50–60 percent in comparison with the past twenty years, while total stock of sheep remained practically the same. Wool production followed the stock variations. In the past 30 years sheep milk production was negligible, only a minor part of ewes was milked.

At the beginning of the 1970s and in mid 1980s two-thirds and more than 80 percent of the increasing output of sheep for slaughter was exported. The share of the key products of animal husbandry and the total exports was not even near to that of the exports of sheep for slaughter. Even before 1990 the total Hungarian exports of sheep for slaughter was sold for convertible currency. The highly valued paschal lambs were exported to the member countries of the European Community, while the heavier sheep for slaughter were mainly exported to the Arab markets.

Table 14

Sheep stock, wool production and output of sheep for slaughter

Year	Sheep stock*		Wool production		Sheep for slaughter	
	thousand heads	Index: 1965=100.0	tonnes	Index: 1965=100.0	thousand tonnes	Index: 1965=100.0
1955	1 690	68.7	–	–	–	–
1960	2 250	91.5	8 175	81.3	19	65.2
1965	2 460	100.0	10 060	100.0	30	100.0
1970	2 316	94.1	9 776	97.2	37	124.3
1975	2 039	82.9	8 393	83.4	35	119.4
1980	3 090	125.6	12 143	120.7	42	142.7
1985	2 465	100.2	11 118	110.5	48	161.9
1990	1 865	75.8	7 337	72.9	35	118.1
1995	1 074	43.7	3 274	32.5	19	63.3
1999	934	38.0	3387	33.7	16	53.3

* December.

After 1990 the sheep stock gradually reduced and by the end of 1999 it was less than one third of the 1965 stock. The majority of sheep stock of earlier large-scale farms is now possessed by the new companies and private breeders. While nearly 70 percent of the sheep stock belonged to the large-scale plants in 1990, their share dropped to one third in a mere four years.

At the beginning of the 1960s the annual production of horse meat amounted to 65 thousand tonnes, equal to approximately 120-130 thousand horses for slaughter. With the consolidation of production in large-scale agricultural plants the horse stock further reduced in Hungary, and at the end of the 1980s it was hardly more than 10 per-

cent of the stock level in the 1950s. Two thirds of this stock was held by small-scale producers.

Nowadays Hungarian agriculture is facing serious difficulties attributable partly to the stagnation which started in the 1980s, and partly to the redistribution of land and other means of production within the framework of privatization of the 1990s. In addition to these internal factors, the insolvency of the markets in the ex-Soviet Union countries added to the deteriorating situation. By its natural endowments Hungarian agriculture could attain again the peaks of its output but, under the prevailing size-structure of holdings, this would require significant investments.

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