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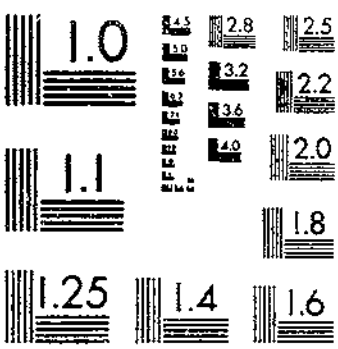

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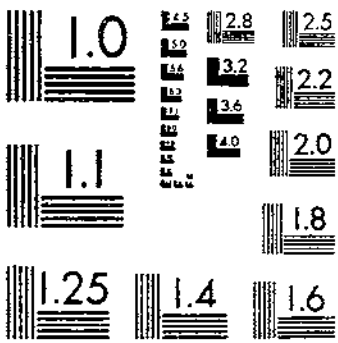

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AGRICULTURAL SURVEY OF EUROPE: HUNGARY

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CONTENTS

HUNGARY AND THE UNITED STATES

Hungary is competing with the United States in Austria and Czechoslovakia on the wheat and flour markets and can become a very considerable competitor as regards pork, lard, and other pork products on the markets of central Europe. The future exportable surpluses of rye, barley, corn, and oats will probably be smaller than before the World War on account of larger domestic use as feeding stuffs in the livestock industries. Hungarian sugar will not in all probability become an important factor in western European markets. It is improbable that the American tobacco situation will be affected, in even a slight degree, by Hungarian demand, as Hungary has in the past utilized very little tobacco grown in the United States. On the other hand, an expanding textile industry will probably absorb increasing quantities of American-grown cotton.

[1] With the collaboration of Susie White, Bureau of Agricultural Economics.

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THE PEACE TREATY AND HUNGARIAN TRADE

Before the World War, the old Kingdom of Hungary possessed a variety of industries that had reached a relatively high grade of development (*5*).[2] After the war, the territories constituting residual Hungary had shrunk to about one-third the size of the former Kingdom. The industries found within this restricted territory continued to develop along the lines that had marked the industrial development of the old régime. Certain lines of endeavor, as the flour-milling industry, fell into a state of stagnation, and some of the milling plants were transformed to meet the requirements of other lines of manufacture.

In pre-war times, the old Kingdom of Hungary controlled its own sources of food products and raw materials, with the exception of cotton. The old Kingdom, with 20,000,000 population, constituted a common-duty territory with the former Austrian Empire, whose population was more than 31,000,000. The agricultural industry of the eastern and southern parts of the Dual Monarchy and the industrial and commercial interests of the west and north enjoyed perfectly free internal trade and protection against the products of outside States. This situation was, in some respects, advantageous to Hungary. A market for practically the whole of the agricultural surplus of the old Kingdom was assured within the former Austrian Empire and, as a rule, Hungarian sellers were not compelled to seek customers beyond the frontiers of the monarchy.

On the other hand, on account of the close association with Austria, the basic industries of Hungary were not developed to a degree commensurate with its raw-material supplies. It had been the policy of the former monarchy to keep Hungary at the level of a raw-material producing country and to concentrate industrial production in Austrian and Czech centers. However, certain industries deeply rooted in agriculture or in forestry, inevitably did develop—such as the milling industry (after Minneapolis, Budapest had the greatest flour mills in the world), the sugar industry, the manufacture of alcohol, beer, starch, salame sausage, vegetable oils, commercial fertilizers, the products of wood distillation, cellulose, and tannin. It was an ancient endeavor of the country to employ a considerable part of the wool crop for the manufacture of cloth, with which to satisfy the demands of its own agrarian population.

As a consequence of the peace treaty, the conditions and prospects of production in Hungary have undergone a material and critical change. Surpluses of all the principal agricultural products of present-day Hungary are dependent for a market on the export trade. Wheat, rye, barley, oats, corn, livestock and meat, potatoes, eggs, vegetables, oilseeds—all alike must be exported for the most part in considerable quantities. Although there is a near-by demand for these materials—at a price—there has developed since the World War, even in States preponderantly industrial in character, a tendency to develop their own agricultural resources—to become as nearly as may be independent of outside sources of supply. As a consequence, the sale of agricultural materials in foreign countries encounters ever-increasing difficulties. It is the tendency of western States, as Austria, Czechoslovakia, and Germany, to force by energetic methods

[2] Italic numbers in parentheses refer to "Literature cited," p. 104.

a free path for their manufactured products and at the time to build up their economic status by employing as far as possible the products of their own agriculture.

Hungarian corn for feeding livestock can find a market here and there in the feed lots of lower Austria and Bohemia, but Hungarian flour is faced with obstacles almost insurmountable. The powerful competition of American flour and lard is keenly felt by Hungarian farmers. In 1913 there were 13 flour mills in Budapest with a daily capacity of 338 carloads [3] of wheat and 79 carloads of other grain. In 1925 only 10 mills with a daily capacity of 300 carloads of wheat worked 20 per cent of their capacity. It is reported that some of these mills have been dismantled as to their milling machinery, and are being fitted with spindles and looms.

The general situation in Hungary may be outlined as follows.

THE AGRICULTURAL SITUATION IN HUNGARY

Hungary, like each of the succession States, has passed through a crisis that has strained national resources to the breaking point. However, the season of 1927 found the worst of Hungary's troubles forced into the background. Its position on the world's money market was improved. The land value of residual Hungary (the portion of the great plains east of the Danube, the Alföld, and the western highlands now comprised within the present frontiers of the country) was estimated at 6,000,000,000 gold crowns or about $1,215,600,000 [4] and there was a national inventory amounting to about 2,000,000,000 additional gold crowns or $405,200,000.[4] The American people have become richer and the Hungarians poorer since the World War; but for this very reason production of farm crops and animal products in Hungary is cheaper than in the United States and the surplus-producing areas of this whole region are in close conjunction with the markets in which American farmers must meet their competition.

Before the World War (1913), it was possible to market American wheat in Liverpool 11 per cent (9) cheaper than the Hungarian farmer could sell his wheat in Budapest. In 1925, Hungarian wheat in Budapest was 8 per cent cheaper than was overseas wheat of similar quality in Liverpool. On the other hand, in spite of a lower standard of living in the countries to the south, the cost of agricultural production in Hungary is relatively less than that in the neighboring Balkan countries because the handling of the soil and animals in southeastern Europe is less scientifically systematic than in Hungary. At the close of 1926, the prices of cattle and swine in Rumania and Yugoslavia were higher than in Hungary. Yields per acre in Hungary average higher than in the southeast and in the best years approach average German standards.

In 1926, Hungarian industries produced wares valued at 1,698,000,000 gold crowns or $344,014,800, in the manufacture of which domestic and foreign raw materials to the value of 900,000,000 gold crowns or $182,340,000 were utilized. On the other hand, the land and the farmers of Hungary produced farm crops, animals, and animal products to the value of 1,800,000,000 gold crowns or $364,680,000.

[3] A carload is 10 metric tons or 22,046 pounds.

[4] The value of the gold crown was 20.26 cents.

The territories comprising the present Hungarian State, occupying the rolling country west of the Danube and the great plains region east of the Danube, the Alföld, have almost no natural resources other than the products of their agriculture. Nearly the entire industry and commerce of the former Kingdom of Hungary [5] was

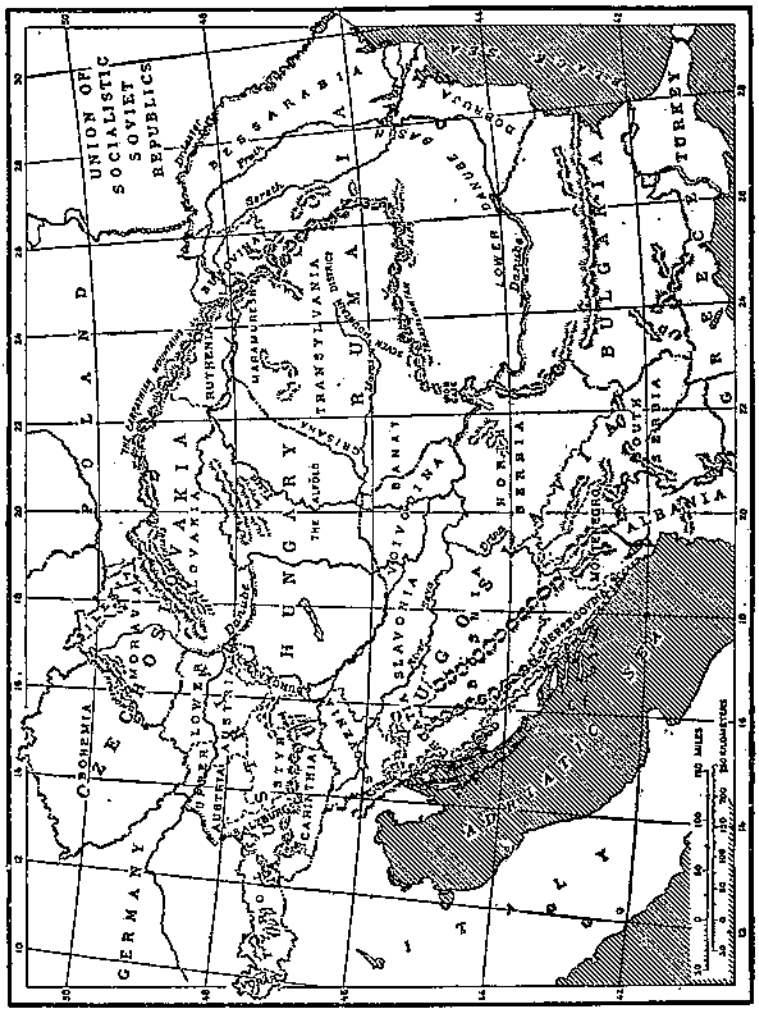

FIGURE 1.—MAP OF THE DANUBE BASIN

Hungary is the residual part of the old Kingdom of Hungary after segregating the territories of Slovakia, Ruthenia, Maramurech, Crisana, Seven Mountains, Banat, Volvodina, and Burgenland to neighboring States.

founded upon the manufacture of and trade in commodities whose raw materials were the products of its own agriculture. More than half of these agricultural products originated in the outlying regions of the old Kingdom which after the World War, were segregated from

[5] In 1913, total exports from the old Kingdom of Hungary were valued at $380,400,000, of which manufactured and semiprocessed goods were valued at $183,200,000. Raw materials were valued at $197,200,000. The most important products of agricultural origin were flour, $51,200,000; cattle and hogs, $46,200,000; wheat, $22,800,000; and barley and corn $15,000,000 (Wilgress (*16*)).

residual Hungary by the treaty of Trianon [6] and were ceded to one or another of the succession States, which were created out of units of the former Austro-Hungarian Monarchy.

The industrial and commercial machinery for handling the surplus raw materials produced in the territories that comprised the old Kingdom of Hungary (that is, (1) in the present residual State of Hungary; (2) in Croatia, Slavonia and Voivodina, ceded to Yugoslavia; (3) in eastern Banat, Crisana, southern Maramuresh and the Seven Mountain region, ceded to Rumania; (4) in Slovakia and Ruthenia, ceded to Czechoslovakia; and (5) in Burgenland, ceded to Austria) was centralized for the most part in Budapest. For this reason, when residual Hungary began its career as a separate, isolated State, it was burdened with an enormous "overhead" of mills that had been cut off on the one hand from their former sources of wheat and other grains to be ground and on the other from the former markets in which they had been accustomed to sell their flour.

There were banks without funds or official affiliations with their branches in former outlying regions. There was an army of merchants whose occupation had been to assemble products from the surplus regions to the east and south and arrange for their transport and disposition in the deficit regions of the north and west. The former Austria-Hungarian Monarchy had been a well-balanced, nearly self-sufficient economic unit. At the beginning of the postwar reconstruction period, these merchants found themselves almost without transportation facilities with which to handle even the small fraction of the former quantities of agricultural products that were available for commerce. The economic existence of the residual Hungarian State is dependent upon the development of a highly intensive agriculture, producing surpluses of field crops and animal products within its own frontiers for export and upon the importation of raw materials or semimanufactured agricultural products for final processing by its mills and factories and the exportation of these in finished form.

The problems of an agricultural State, like Hungary, are totally different from those of an industrial region like northwestern Czechoslovakia or a commercial State like Austria. An agricultural State has the advantage that it can subsist under the most straitened circumstances without impairing its international credit through costly importations of food, as was the case with the Republic of Austria. On the other hand, it must depend upon the products of its soil to build up its international credit because it has no large surplus of manufactured goods (cotton, glass, iron, etc.) to send abroad as is the case with Czechoslovakia.

Thus, at the outset of its restricted existence, residual Hungary, although passing through very nearly as catastrophical a period of currency depression as residual Austria, was nevertheless able to subsist upon the products of its own soil and to survive the succession of crises of the past few years.

The struggle of Hungarian agriculture during the first few years following the World War has been that of adjustment to the burdensome conditions of heavy taxation and lack of credit at home and the

[6] For a discussion of the changes in boundary following the treaty of Trianon upon the agricultural situation in Hungary see (*10, p. 9–45*).

difficulty of finding favorable markets abroad. The situation, broadly speaking, is that Hungary, an essentially agricultural country, must endeavor to secure markets for its agricultural products by opening its doors to manufactured articles from abroad. On the other hand, highly industrialized countries, such as Germany, Austria, and Czechoslovakia, the most important markets from the Hungarian point of view, are naturally reluctant to throw down the barriers which protect their own agricultural interests, since the Hungarian market for their manufactures is too insignificant to outweigh the disadvantages involved in opening their markets to Hungarian wheat, flour, pork, beef, sausages, and lard. It is not so much Hungarian competition that they fear as that of Canada, Argentina, the United States, and even a resuscitated Russia, against which countries they could not consistently close their frontiers once they had opened them to Hungary.

By 1926, Hungarian agriculture, in spite of all handicaps, had recovered its pre-war averages as regards rye, corn, potatoes, and sugar beets, as indicated in Table 1. However, there are some indicative shifts in the relative manner in which the various cereals were seeded in 1926 as compared with the pre-war manner of seeding.

TABLE 1.—*Cereals, potatoes, and sugar beets: Average acreage seeded in present Hungary, 1909–1913 and in 1926, and acreage sown by large and small holdings during 1926*

Crop	Total acreage sown in—[1]				Holdings in 1926 of 100 Jochs (142.2 acres) or more [1]		Holdings in 1926 of less than 100 Jochs (142.2 acres) [1]	
	Average 1909–1913		1926		Acreage sown	Percentage	Acreage sown	Percentage
	1,000 acres	*Per cent*	*1,000 acres*	*Per cent*	*1,000 acres*	*Per cent*	*1,000 acres*	*Per cent*
Wheat	3,712	38.3	3,706	37.8	1,126	35.3	2,535	38.3
Rye	1,608	16.6	1,729	17.7	533	16.7	1,190	18.0
Total	5,320	54.9	5,435	55.5	1,659	52.0	3,725	56.3
Barley	1,322	13.7	1,050	10.7	419	13.2	684	10.3
Oats	849	8.8	670	6.9	334	10.5	355	5.4
Corn	2,192	22.6	2,631	26.9	775	24.3	1,854	28.0
Total 5 cereals	9,683	100.0	9,795	100.0	3,187	100.0	6,618	100.0
Potatoes	619		619		181		441	
Sugar beets	131		156		139		17	

[1] Total acreages were taken from succeeding tables which show the latest available figures for 1926. These figures will not check in all cases with the sum of the figures for separate holdings which are preliminary and were taken from a different source.
[2] From (*9, p. 141*).

The outstanding shift in relative cereal acreage occurs in corn, which by 1926 had increased 439,000 acres over the pre-war average. The next important change is in rye, which shows an increase of 121,000 acres. As will be shown later, not only has rye production increased somewhat, but there has been a positive increase in rye consumption, more than offsetting the decrease in wheat disappearance.

There was a small decrease in wheat of 6,000 acres in 1926, but in 1927 wheat acreage was 309,000 acres above the pre-war average. In 1926, barley and oats had fallen off appreciably—272,000 acres in

the case of the former and 170,000 acres in the case of the latter cereal—with a further decrease in 1927.

On the whole, the acreage of the five chief cereals had increased; but the rates at which corn and rye were seeded indicate an increased influence of peasant agriculture following the Hungarian land reform in which greater areas are devoted to the production of human food and feed for hogs and cattle to be consumed on the farm. The decreased seeding of barley and oats indicates a decreased influence of large-estate agriculture, in which wheat and barley were grown extensively as cash crops and oats as feed for horses, whose breeding was a well-established industry among the landed nobility.

It will be noted that 71 per cent of the potato acreage was planted by the peasants in 1926; whereas the estates planted 89 per cent of the sugar-beet area.

These shifts in areas seeded have not affected the general utilization of land.

UTILIZATION OF LAND

The area of residual Hungary in 1927 was placed at 22,970,000 acres, of which 93.8 per cent was classified as productive land. Of this productive land, 60.3 per cent was under plow, 18.1 per cent meadows and pastures, and 11.7 per cent forests. A small acreage was devoted to gardens and vineyards. (Table 2.)

TABLE 2.—*Utilization of land in Hungary, present boundary, 1911, 1921, and 1927*

Utilization of land	1911 [1]		1921 [1]		1927 [2]	
	Acreage	Percentage of total acreage	Acreage	Percentage of total acreage	Acreage	Percentage of total acreage
	1,000 acres	*Per cent*	*1,000 acres*	*Per cent*	*1,000 acres*	*Per cent*
Plowlands	13,351	58.2	13,784	60.1	13,837	60.3
Meadows	1,706	7.4	1,646	7.2	1,657	7.2
Pastures	2,523	11.0	2,501	10.9	2,497	10.9
Gardens	246	1.1	246	1.1	252	1.1
Vineyards	499	2.2	539	2.4	534	2.3
Forests	3,094	13.5	2,714	11.8	2,695	11.7
Reeds	81	.4	69	.3	73	.3
Unproductive	1,422	6.2	1,423	6.2	1,425	6.2
Total	22,922	100.0	22,921	100.0	22,970	100.0

[1] U. S. Dept. Agr. Bul. 1234 (*10, p. 8*).
[2] Die Landwirtschaftliche Produktion der Welt im Jahre 1927 (*6, p. 355*).

Hungary is outstandingly a country devoted to field-crop production and the livestock industry. Wine making is also an important industry though restricted in scope.

THE MAGYAR PEOPLE

In the sixth century, Attila, the "scourge of God," raided Europe, was defeated, and his shattered hordes drifted back over the Carpathian Mountains toward Asia. Some 300 years later the vanguards of a similar people, the Magyars, under seven great princes seeped through the mountain passes into the forests of Seven Mountains (now part of Transylvania). When Kaiser Arnull invited these Magyar princes to aid him against the Moravians, who were crowding his people, the Germans, up into the Alps, he opened the way for this

steppe people, weary of their sojourn in the mountains, to appropriate a new fatherland admirably suited to their needs. This was in the year 896.

Originating in the steppe countries north of the Caucasus Mountains, these closely related peoples, called Magyars, had for centuries drifted across the steppes of southern Russia and up into the Carpathians at last to find a resting place on the Alföld—the lowland plains or steppes of the Danube basin. They found the land sparsely inhabited by herders of cattle and tenders of sheep living in mud huts. The Magyars pitched their tents and appropriated the best of the pastures and meadows for their own wiry horses, their enormously long-horned cattle, and their long-haired milk sheep.

They had brought with them Slavic slaves whom they set to tilling the soil and herding cattle and sheep. The care of the swine was woman's work. The men occupied themselves only with the breeding and care of the horses and those pursuits that fitted them for battle. When they arrived, the Magyars found Slavic tribes scattered over the plain, as well as Teutons, Avars, Goths, and perhaps some remnants of the aboriginal Celts. The Serbs, Croats, and Slovenes were driven into the highlands to the south, the Germans into the foothills of the Alps, the Czechs, Slovaks, and Ruthenians into the foothills of the Carpathians, and the Rumanians into the Transylvanian Mountains. The other peoples, having no place to which to retreat, remained to be absorbed.

The princes and the warriors proceeded to war until, as the centuries passed, the flaming spirit to battle became more and more feeble and it became more and more difficult to muster raiding parties just for the love of raiding. The clusters of mud huts took on more permanent form, whose architecture was borrowed from the Czechs. Tilled fields encroached farther and farther out into the grasslands; but, until recent times grazing and herding remained the chief occupations of this people.[7]

The Hungarian (Magyar) peasants are serious, intelligent, and industrious. They are not as commercially inclined as are the Czechs or the Slovaks, and therefore their land holdings are operated for the welfare of the household and not for the monetary profit involved. The chief aim of the Hungarian peasant is to live a quiet life and to assure the well-being of his descendents. In their migrations, the Magyars were characterized as an obedient people and accepted the civilization, the religion, and the education of western Europe at the command of their leaders. As Doctor Leopold (*9*) says, the Hungarian peasant is no "far-western farmer" neither is he a "near-east mushik." Of Asiatic blood, this people were quick to adopt the civilization of the west and so are the meeting point of the Occident with the Orient. In recent years, they have adopted improved methods of farming, better seeds, and better breeds of livestock. The Hungarians are not so far advanced in agricultural technic as the Germans or the Czechs, but are superior to the peoples to the south and east. Much peasant grain is still harvested with a sickle, but the Hungarians have adopted the scythe and the cradle as well as the flail, whereas in Rumania, Yugoslavia, and Bulgaria these "modern" farm implements are seldom if ever seen.

[7] The horse herder was a leading man in the village and was distinguished by a special black shirt. The cattle herder was also a personage and rode on horseback. The sheep herder went on foot or at best was seated on a donkey. (*7, p. 86.*)

The working year in Hungary is not mutilated with the untimely holidays of the nations to the south and east, and therefore farming operations are performed in a more nearly timely manner. Yields per acre obtained by the Hungarian, as well as the general quality of his farm animals, are higher than those found in the Balkans, Transylvanian Alps, the Carpathians, and the plains beyond.

As in other countries, when the nomadic clans began to settle on the land, groups of villages fell under the control of a prince or other noble. As field cultivation superseded the earlier pastoral life, these great lords retained their equity in the soil and became owners of vast estates, whereas the common people were alloted land holdings barely sufficient to maintain a family. These villagers who have dwelt in the same communties for forgotten generations are passionately attached to the soil and are strongly bound by ties of loyalty to the families of their hereditary princes or lords.

POPULATION

In 1920 the total population of residual Hungary numbered 7,980,143, of whom 7,147,053, or 89.6 per cent, claimed Hungarian as their mother tongue. There were 551,211, or 6.9 per cent, who spoke German and 141,882, or 1.8 per cent, Slovakian. Other races were represented by insignificant numbers totalling 139,997, or about 1.7 per cent.

Next after the Magyar population, the German-speaking element plays an important rôle in the economic life of the country just as it is an important factor in the economic life of Czechoslovakia. About 94,000 German-speaking Hungarian subjects lived in the large cities[8] and county seats in 1920. They are occupied chiefly with finance, commerce, and industry. There are relatively few Germans on the watershed of the Tisza River; but 330,826 are found in small hamlets, villages, and towns of lesser importance in the counties on the right and left banks of the Danube. Although it is not possible to analyze the status of this German population as to occupations it is safe to say that the great majority of them are farming colonists brought into the country by various monarchs who established small groups of these northerners among the Magyars to set an example in farm procedure. In the western counties are found 107,159 additional Germans. Those along the Austrian frontier are native to the country, whereas those more in the interior are colonists who have migrated from the north during recent centuries.

In 1910, there were 56 per cent of the population of residual Hungary dependent upon agriculture for a livelihood, as compared with

[8] Cities whose populations exceed 24,000. The only city of importance in Hungary is the capital, Budapest, whose population in 1920 was placed at 928,996, of whom 60,425 claim German as their mother tongue. This is the great commercial center in which all railway lines converge and whose position on the Danube makes it the most important river port next after Vienna. Nearly all the other large towns are "market towns" to which the surrounding farmers bring their products and whose chief activities are concentrating agricultural surpluses and supplying the simple wants of the surrounding districts. Szeged, with 119,400 inhabitants in 1920, is the commercial center of lower Hungary. It is located on the Tisza, near the Yugoslavian frontier. Debrecen (103,186 inhabitants) is the most important town in the northeast. Kecskemet (73,109) is an important grain and cattle market on the Alföld between the Danube and the Tisza. In the northwest, Győr (50,036) and in the southwest Pecs (47,556) are the most important market centers. Other large towns are Miskolc (56,982), Hodmezöväsárhely (60,922), Erzsébetfalva (40,545), Székesfehérvár (39,109), Rakospalota (36,008), Sopron (35 248), Bekes (28,161), Torokszentmiklos (26,303), Csongrad (25,888), Szarvas (25,224), and Oroshaza (24, 079). In 1920 there were 44 cities ranging fron 10,069 to 19,371 inhabitants each, totalling 574,041. There were 127 large towns ranging from 5,005 to 9,985 inhabitants each, totaling 875,152. Many of these towns are largely communities of farmers and farm laborers. There were 660 towns ranging from 2,000 to 5,000 and totaling 1,696,975 inhabitants and 832 villages (1,000 to 2,000 inhabitants each), totaling 1,162,660 for the group. The remaining 1,950,254 inhabitants of Hungary lived in small hamlets and villages of less than 1,000 each.

30 per cent industrials and 4 per cent in public service. The remainder of the population formed small groups engaged in various occupations. There were 4,256,172 farming peasants and their families in 1910, as compared with 4,449,105 in 1920. During this decade, total population had increased from 7,606,971 to 7,980,143, so that the proportion of farm population remained about the same as before the World War, being 55.7 per cent of the total in 1920. As indicated in Table 3, there were increases in those engaged in commerce in transport, in public service, in the army, and in the capitalistic class, but there was a sharp decline in the number of day laborers.

TABLE 3.—*Population classified according to occupation in residual Hungary, 1910 and 1920*

Occupation	1910		1920	
	Number	Per cent	Number	Per cent
Agriculture	4,256,172	55.9	4,449,105	55.7
Mines, industry, commerce, and transport	2,274,898	29.9	2,402,799	30.1
Public service	303,445	4.0	372,165	4.7
Army	63,164	.8	124,880	1.6
Day laborers	178,015	2.3	97,489	1.2
Capitalists, etc.	145,510	1.9	196,825	2.5
Domestics	214,979	2.8	175,461	2.2
Other professions and unknown	170,788	2.3	161,719	2.0
Total	7,606,971	100.0	7,980,143	100.0

Pub. Statis. Hongroises, Recense de la Population en 1920, 71: 1.* 1925.

THE LAND REFORM

Immediately following the World War a series of peasant disturbances developed into a Bolshevik uprising. Thousands of landless peasants, who had no means of livelihood other than the wages received for working on some large estate or for some of the more fortunate small landowners, joined forces with the idle workingmen in the large centers and temporarily gained control of the centers of government. In many cases estate owners were forced to let their modern machinery stand idle and to allow their fields to be cultivated by the primitive hand methods of the lowest class of peasants in order to give employment to larger numbers of land-hungry malcontents.

Many of these large estates had been held by individual families of the Magyar nobility for centuries; but others had been acquired by the newly rich during the World War and postwar years. It was this last class of recently acquired holdings that particularly irritated the many landless farm laborers and small farmers who did not own sufficient land for the support of an average family. These conditions led to the enactment of the Land Reform Law XXXVI of 1920; but on account of the peculiar attachment of the Hungarian peasants for the families of the Magyar nobility this land reform was not so drastic as in parts of Rumania[9] to the east, where the landed gentry was often of blood foreign to that of the common people.

At the time of the passage of the land-reform law in 1920 there were approximately 17,000,000 acres of plowland, meadows, and

[9] In Transylvania and Bessarabia.

pastures in residual Hungary. About one-third of this area, or 5,830,000 acres, was operated in holdings of more than 1,000 Jochs (1,422 acres) each. This land was owned by a very few great landlords. As indicated in Table 4, there were, in 1920, only 8,008 owners or operators of holdings of more than 100 Jochs (142.2 acres) each actively engaged in farming; whereas 548,000 heads of families owned or operated less than 100 Jochs each. In addition to the small landowners (who were aided by 574,180 members of their own families), there were 753,638 farm laborers (probably landless) and 234,019 domestics and other employees classified as gaining a livelihood by farming. Thus out of 2,118,145 active farmers and farm laborers only 8,008, or 0.38 per cent, were owners or operaters of holdings of more than 142.2 acres each.

TABLE 4.—*Active agricultural population in residual Hungary, 1910 and 1920*

Classification	1910	1920
Heads of families:	*Number*	*Number*
Proprietors of more than 142 acres	7,084	8,111
Farmers of more than 142 acres	2,124	1,897
Small owners	518,227	525,537
Planters	8,546	18,802
Herders, etc	951	590
Gardeners	2,423	2,461
Total	539,355	556,308
Other members of families helping in farm work:		
Males	266,659	303,801
Females	103,378	270,379
Total	370,037	574,180
Laborers:		
Employees	5,079	5,331
Domestic	246,285	228,688
Day laborers	516,297	753,638
Total	767,662	987,657
Grand total	1,677,054	2,118,145

Pub. Statis. Hongroises, Recense. de la Population on 1920 71:8.* 1925.

The land reform in Hungary was of two general types: (1) Under the first of these, known as land expropriation, certain properties of over 500 acres were subject to division among the peasants according to their local needs. The peasant had to assume responsibility for the share of the mortgage debt of the estate allotted on a pro rata basis to the land that he accepted. (2) The second type of land reform was known as wealth redemption and applied only to properties of more than 1,000 acres. It was intended to apply primarily to lands acquired since the beginning of the World War. Usually only 10 per cent of an owner's holdings have been taken, although occasionally a much larger percentage has been expropriated. Such lands were taken from the owner without compensation and had to be transferred to the State free of all encumbrances.

Most of the land that has been distributed among the peasants during the land reform has come into possession of the State under the provisions of the wealth redemption law. Only such part of any large holding acquired 50 or more years before the World War as would not jeopardize the profitable cultivation of the estate has been taken from those estates belonging to the established landed gentry.

The court in charge of readjustments of land holdings under the provisions of the land-reform law began to function on June 20, 1921, and continued until September 16, 1926. During this period 1,590,000 acres of land were assigned to new owners. Of this area, 344,000 acres were designated as sites for buildings.

The land reform has resulted in increasing the proportion of plowland held in small plots from 55.5 per cent in 1913, to 66.7 per cent in 1926.

The enactment of the land reform law in 1920 created a nervous attitude on the part of the large-estate owners toward making necessary improvements and even toward carrying out a full planting program because there was the possibility that the owners would be dispossessed of their fields. As a result of this and other deterrent factors, including the system of maximum prices fixed by the Government, about 2,548,000 acres were left unplowed in 1921.

The acreages of wheat, rye, corn, and sugar beets in 1926 had not only recovered their pre-war status, but the production of these commodities was greater than it had been before the World War, as indicated in Table 5.

TABLE 5.—*Cereals, potatoes, and sugar beets: Average production and yield per acre in present Hungary, 1909–1913 and 1926, and production and yield per acre by large and small holdings during 1926*

Crop	Total production—[1]				Production in 1926 on holdings of 100 Jochs (142.2 acres) or more[2]		Production in 1926 on holdings less than 100 Jochs (142.2 acres)[2]	
	Average 1909–1913		1926					
	Total	Yield per acre[3]	Total	Yield per acre[3]	Total	Yield per acre[3]	Total	Yield per acre[3]
	1,000 bushels	*Bushels*	*1,000 bushels*	*Bushels*	*1,000 bushels*	*Bushels*	*1,000 bushels*	*Bushels*
Wheat	71,493	19.3	74,908	20.2	23,441	20.8	45,759	18.1
Rye	31,377	19.5	31,416	18.2	10,196	19.1	19,810	16.7
Total	102,870	19.3	106,324	19.6	33,637	20.3	65,578	17.6
Barley	32,360	24.5	25,509	24.3	8,560	20.4	14,095	20.6
Oats	23,454	33.5	24,802	36.5	12,315	36.9	11,616	32.7
Corn	60,813	27.7	76,544	29.1	25,246	32.6	53,580	28.9
Total 5 cereals	224,516	23.2	233,179	23.8	79,758	25.0	144,869	21.9
Potatoes	71,118	114.9	68,880	111.3	21,944	121.2	45,386	102.9
Sugar beets	*1,000 short tons* 1,513	*Short tons* 11.5	*1,000 short tons* 1,592	*Short tons* 10.2	*1,000 short tons* 1,363	*Short tons* 9.8	*1,000 short tons* 144	*Short tons* 8.5

[1] Total production average 1909–1913 and annual 1926 were taken from succeeding tables which show the latest available figures for 1926. These figures will not check with the sum of the figures for separate holdings which are preliminary and were taken from a different source.
[2] Separate holdings, 1926 (9, *p. 142*).
[3] See Table 1, for acreages.

PEASANT FARMING AND YIELDS PER ACRE

Comparing the mean yields per acre obtained in 1926 with those of 1909–1913, rye, barley, potatoes, and sugar beets averaged less than before the World War. This falling off in yield is the result of poor returns on small holdings. (See p. —.) The yields per acre for four out of the seven major crops on the large estates were greater in 1926 than the 1909–1913 average for each crop on both large estates and peasant holdings in all residual Hungary. On the other hand, the yields were less on small holdings, except in the case of corn, which was 1.2 bushels greater than the 1909–1913 average for both large and small holdings.

Among the great drawbacks to agriculture in residual Hungary are the capricious rainfall and the devastating dry winds that sweep over the great plains in early spring, at plowing time, and intermittently during the growing season. The small peasant holdings are usually located on the poorest land—stony not uniform in soil characteristics, and of such irregular shapes and small size as to preclude the use of modern machinery in the tillage of the soil.

This is in sharp contrast to the large estates, which are able to employ moisture-conservation methods—deep fall plowing, proper and timely preparation of the seed bed in the spring, and timely cultivation, especially of corn, potatoes, and sugar beets, during the growing season. The peasants not only lack a proper appreciation of the necessity for timely moisture conservation but they do not have the proper cultural implements. Consequently, when drought comes, the falling off in yield is greater on peasant holdings than is the mean falling off in the country as a whole.

On the other hand, the peasants are relatively better supplied with horse and ox power than are the estates, and if they were equipped with machinery and had sufficient technical knowledge they would be able to cultivate their larger fields, at least, more intensively than at present.

Before the World War, the peasants holding less than 284.5 acres each were in possession of 55.5 per cent of the plowlands of residual Hungary. Together with landless individuals, they owned (Table 6) 87.2 per cent of the horses, 70.3 per cent of the cattle, 84.5 per cent of the swine; but only 28.8 per cent of the sheep.

TABLE 6.—*Livestock and owners of livestock classified according to size of land holdings in Hungary, present boundaries, 1911, and total 1928*

Size of land holding	Owners of livestock	Horses	Cattle	Swine	Sheep	Goats	Mules	Donkeys
Without land	273,880	84,845	207,044	896,075	102,206	13,751	81	1,079
Less than 1 arpent (1.4 acres)	34,976	9,089	23,228	75,357	7,434	3,120	6	271
1 to 5 arpents (1.4 to 7.1 acres)	183,828	89,749	25,201	386,095	43,811	9,720	50	1,558
5 to 10 arpents (7.1 to 14.2 acres)	131,254	137,191	296,602	346,697	52,077	3,437	12	295
10 to 20 arpents (14.2 to 28.4 acres)	115,195	191,850	360,523	433,455	96,641	2,028	5	182
20 to 50 arpents (28.4 to 71.1 acres)	68,860	178,960	320,312	396,347	171,729	1,255	9	158
50 to 100 arpents (71.1 to 142.2 acres)	13,901	50,660	108,497	117,090	106,225	245	1	121
100 to 200 arpents (142.2 to 284.4 acres)	4,606	22,944	65,749	59,380	98,767	220	3	138
Total small and middle-sized land holders	552,620	679,343	1,200,110	1,819,921	576,684	20,376	86	2,723
200 to 500 arpents (284.4 to 711 acres)	3,121	23,517	101,414	71,805	192,040	237	34	451
500 to 1,000 arpents (711 to 1,422 acres)	1,677	24,672	122,977	92,891	278,412	153	30	693
More than 1,000 arpents (1,422 acres)	1,821	63,592	369,614	332,726	1,204,296	448	182	2,033
Total large land holders	6,619	111,781	594,005	497,422	1,674,748	838	246	3,177
Total 1911	833,119	875,969	2,001,159	3,213,418	2,353,638	34,964	413	7,879
Total 1928	(1)	917,974	1,811,647	2,661,539	1,566,451	29,836	1,539	4,689

1911 calculated from Magyar Statisztikai Évkönyv 1912: 126-137. 1928 from Magyar Statisztikai Szemle Année 6 (7).

[1] Not available.

The advantage of numbers of animals to small holdings is not as great as at first appears because as pointed out by Kenez (*14, p. 24*): "There can be a great difference between animal, and animal and numbers alone should not form the criterion. Our large-estate owners keep heavier, better bred, and better fed animals than the small peasant farmer." The weight of livestock per 100 Jochs on small holdings is estimated at 7,500 kilograms (11,627 pounds per 100 acres), on middle-sized holdings at 5,000 kilograms (7,752 pounds per 100 acres), and on large estates at 6,200 kilograms (9,613 pounds per 100 acres).

MORE DRAFT ANIMALS REQUIRED ON SMALL HOLDINGS

Up to September 16, 1926, the administrators of the land reform had distributed 1,590,000 acres of land from the large estates among more than 390,000 petitioners. The size of the individual plots was consequently small. The practical effect of this transfer has been to remove 1,246,000 acres of land [10] from large-estate cultivation and to place these acres under the control of peasants, who were poorly equipped with implements, capital, and knowledge. In many cases the new owners also lacked proper draft animals and those that did possess horses or oxen did not own animals comparable with those on the large estates. These small parcels of newly acquired land could not be located contiguous to the fields already owned by the poor peasant. At best his new morsel of land was located at a greater or less distance from his home and usually at a distance from his former holdings. Rational cultivation of these newly acquired plots is thus out of the question.

It has been estimated that small owners of 10 to 20 hectares of plowland (24.71 to 49.42 acres) own one horse or ox for each 4 or 5 hectares (9.9 to 12.4 acres). Similarly, there is one horse or ox for each 6 or 7 hectares (14.8 to 17.3 acres) on holdings ranging from 20 to 50 hectares (49.4 to 123.6 acres). One draft animal must work 7.5 to 8 hectares (18.5 to 19.8 acres) on holdings from 50 to 200 hectares (123.6 to 494.2 acres); whereas, on large holdings between 494.2 and 2,471 acres there is only one draft animal for each 22.2 to 24.7 acres.

On the larger estates, with the supplementary use of modern machinery, more than twice as many acres can be cultivated by one animal than is the case on the smaller holdings. Following the parcellation of the land a greater number of horses or oxon have been required to till the soil than was necessary when the land was part of a large estate. In 1925 and 1926, about 680,000 acres of land were transferred to the peasants. It has been estimated that, as parts of estates, it required from 30,000 to 35,000 horses, whereas under present conditions it would need 60,000 to 70,000 horses, or the equivalent of other draft animals to maintain the soil of this acreage in a state of tillage comparable with that common to large-estate agriculture.

As in other countries, so in Hungary, the increased influence of peasant farming upon the agriculture of the country has tended to reduce field-crop production per acre below what would have been harvested had there been no change in the manner of land tenure.

[10] A portion of expropriated land was utilized as building sites, etc.

HANDICAPS TO AGRICULTURAL DEVELOPMENT [11]

The agricultural development of the present Hungarian State is handicapped by the fact that, although the soil is in general fertile, the climate is capricious and is inclined toward extremes of heat and cold, drought, and torrential rains. Droughts are dreaded most by the small landholders whose plots of land are, as a rule, not large enough to enable them to employ machinery and are usually so situated as to render impossible the employment of proper moisture-conservation methods. During the lapse of the 27 years ended 1900, there were 63 periods of more than two weeks duration in which no precipitation occurred as follows: Three times there was a drought of 15 days duration; droughts from 16 to 20 days occurred 31 times; droughts from 21 to 25 days, 14 times; droughts from 26 to 30 days, 8 times; droughts from 31 to 35 days, 6 times; and once there was a drought continuing 55 days (*9, p. 148*).

At least twice during the year, there must be expected in Hungary periods of two weeks or more in which no moisture is added to the soil and often this period of drought occurs during the growing season. There is the further danger to production arising from dry winds, which sweep the country in March and April and dry out the newly turned furrows. Dry winds occur during the growing season and, if maximum yields are to be obtained, a constant fight for moisture conservation must be waged. For these reasons, low yields and even partial crop failures must be expected frequently. Nevertheless when climatic conditions are favorable and the soil is properly tilled, very large production is the result.

During the World War, the condition of the soil was depleted, particularly on peasant holdings, because of lack of labor and the essential implements for tillage. The numbers of livestock on feed also dropped below normal during the war period. The indirect importation of fertility through the purchase of feeding stuffs from other regions diminished and, because the customary manure was wanting, field-crop production dropped.

The Magyars settled upon the Alföld more than a thousand years ago and, for more than 10 centuries, they have tilled the soil of the plains and the hill regions of the west. There has been but little migration within the country itself. The peasants are descended through hundreds of years from ancestors, who have lived in the same village groups, who have tilled the same fields, planted the same kinds of crops, and have tended the same kinds of animals for generation after generation. Deep-seated farming traditions have been built up in almost every family concerning the manipulation of each particular field. One of the traditions most deeply seated and most universally inground into the consciousness of the Hungarian peasant is that of manuring his soil to insure to his children at least as good a chance to live as he himself possesses. To this end, he clings to his livestock.[12]

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[11] For description of physical characteristics of Hungary see (*10, p. 7*).

[12] A Hungarian peasant is very reluctant to sell his cattle in order that his year's accounting may show a profit. "Better animal husbandry at a loss, than no livestock. He will maintain the soil in as fertile a state, through use of stable manure, as he inherited it from his father." Free translation. (*9, p. 165*).

INCREASING PRODUCTION

A limited portion of the Hungarian plain could be improved by drainage, and there are other districts that would return greater yields through irrigation. It is no longer possible to graze cattle on the pastures and meadows of Hungary for the profitable production of beef, or even draft animals, without taking into consideration an appreciable return from milk and milk products. The quality of these pastures and meadows can be greatly improved and in the budgets of 1925–26 and 1926–27 the equivalent of half a million gold crowns [13] or about $101,000 were assigned for this purpose. But this amount is inadequate to cope with the problems to be solved. There are also about 500,000 Jochs (711,000 acres) of "claypan lands," of which about 200,000 Jochs (284,000 acres) can be improved.

Any improvement in agricultural production through extension and improvement of area is strictly limited. Greater progress can be made in cultural methods and improved seeds. However, as Doctor Leopold has pointed out, after all has been said, domestic animals remain the most pronounced accumulators that respond to agricultural skill. Livestock do not always bring in a cash profit, but they always represent wealth.

FERTILIZERS

The nitrogenous fertility of the soils of residual Hungary, before the World War, was maintained almost entirely by the use of stable manure and the cultivation of leguminous plants. The soil responds to the application of phosphorous of which the pre-war utilization was roughly 12,200 carloads [14] or about 134,000 short tons.

The Hungarian peasant understands the use of natural manure. Doctor Leopold, in Die Volkswirtschaft Ungarns im Jahre 1926, estimates that the cattle, horses, swine, and sheep produced enough manure, in 1926, to supply 40 quintals per Joch or 3.1 short tons per acre of plowland. It is not possible to state that stable manure is utilized with equal care in all parts of the country; but, taken as a whole, Hungary does not stand in acute need of nitrogenous manures. In 1925 the Hungarian farmers cultivated 8.45 per cent as much land to leguminous plants as to wheat, rye, barley, oats, and corn, as compared with 0.33 per cent in the old Kingdom of Rumania. In 1927 the Ministry of Agriculture distributed 2,205 short tons of superphosphates among small farmers in some 2,000 localities.

The use of phosphate fertilizers has steadily increased since the World War until 1927, when the use of superphosphates reached 177,470 short tons (Table 7); that is, it was 32 per cent greater than the estimated pre-war use.

The utilization of other fertilizers in 1927, as contrasted with their use in 1926, was as follows: Lime-nitrogen compounds, 3,869 short tons, as compared with 2,194; ammonium sulphate, 2,658 short tons, as compared with 1,720; Chili saltpeter, 1,709 short tons, as compared with 1,113; and potash fertilizers 2,976 short tons in 1927, as compared with 3,516 in 1926.

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[13] One gold crown was equivalent to 20.26 cents.
[14] One carload is 10 metric tons or 22,046 pounds.

TABLE 7.—*Superphosphates: Utilization, importation, and domestic production in Hungary, pre-war, and 1921–1927*

Year	Utilized in agriculture	Importation	Produced in residual Hungary
	Short tons	*Short tons*	*Short tons*
Pre-war year	134,481	(1)	(1)
1921	7,165	11	7,154
1922	16,534	22	16,512
1923	47,950	22	47,928
1924	49,604	2,370	47,234
1925	93,695	14,473	79,222
1926	94,798	22,046	72,752
1927	177,476	(1)	(1)

(*9, p. 158; 15, p. 69.*) Figures converted from carloads at the rate of 10 metric tons = 1 carload.

[1] Not reported.

COMMUNICATION

There are 30.6 miles of wagon roads to each 100 square miles of territory in Hungary, as compared with 97 in Moravia and 124 in Silesia. There are 14.6 miles of railroads to each 100 square miles of territory, as compared with 14.8 miles in France. The main trade routes connecting Rumania, Bulgaria, Yugoslavia, and Turkey converge on Budapest, which is situated at the bend of the Danube as it leaves the hill country of the west and turns to flow south through the great plain (the Alföld), through Yugoslavia and thence east between Rumania and Bulgaria to the Black Sea. There are eight trunk lines radiating from Budapest, which give easy access to all surrounding States, including Poland and the Ukraine. These trunk lines are connected with a network of branch lines, which reach to all of the chief surplus-producing centers. Cheap transportation is afforded by the Danube, now an international waterway, from Budapest into Bavaria upstream and to the Black Sea downstream. There are two other navigable streams. The Tisza River affording transportation for 219 miles from the Czechoslovakian frontier south through the Alföld to Yugoslavia. The Maros River is navigable for about 16 miles from its junction with the Tisza east to the Rumanian frontier.

RELATIVE STATUS OF FIELD CROPS AND LIVESTOCK

The larger numbers of animals on small holdings presupposes a larger percentage of field products fed at home than in the case of the large estates. Before the World War it was estimated that the small peasant fed 48.86 per cent of his barley, as contrasted with 10.08 on the large estates; 70.14 per cent of oats, as compared with 40.76 per cent; and 81.57 per cent of corn, as compared with 62.08 per cent fed on large estates.

The small peasant farmer obtained 52.2 per cent of his income from the sale of animals and animal products, the middle-sized farmer 25.8 per cent, and the large-estate operator 33.9 per cent.

The relatively greater importance of domestic animals on small holdings than on those of larger size would indicate that, following the land reform, there should have been a trend toward an increase in the number of animals on Hungarian farms. However, a com-

parison of the numbers of livestock in 1928 with the numbers of animals in residual Hungary in 1911 (Table 6) does not reveal such an increase except in the cases of horses and mules. The number of cattle in 1928 were 90.5 per cent of the 1911 number; the number of swine, 82.8 per cent; the number of sheep, 66.6 per cent; and the number of goats, 85.3 per cent. This is in sharp contrast to the acreage of cereals, which in 1928, was 104 per cent of the 1909–1913 average, the potato acreage was 105.8 per cent and sugar beets 125.2 per cent of the pre-war averages.

The explanation of this apparent anomaly is that the numbers of animals recorded by the census of 1911 represent not only the cattle, swine, and sheep born and bred on the farms of residual Hungary but include large numbers of animals shipped in from other districts that were being fattened in the feed lots of commercial concerns engaged in the preparation of slaughter stock for the markets of Vienna, Budapest, and other large centers at the time that the census of 1911 was taken. These animals were bred for the most part in Croatia, Slovenia, and Voivodina, now parts of Yugoslavia; in Banat and Crisana, now parts of Rumania; in Slovakia and Ruthenia, now parts of Czechoslovakia; and in Galicia, now part of Poland. Not only were lean animals shipped into Hungary to be fattened for western and northwestern markets, but large quantities of feeding stuffs—hay as well as grain—were shipped to the vicinity of Budapest and the counties as far west of the Danube as the Austrian frontier from the surplus-producing districts of eastern and southeastern districts of the old Kingdom of Hungary. In all this western region the dairy industry was an important branch of farming.

PRODUCTION AND CONSUMPTION

The Hungarian villagers eat more vegetables and less cereals and meat than do the Austrians or the Czechs. The Austrians and the Czechs are strongly addicted to the use of coffee, whereas the Hungarian peasants seldom drink either coffee or tea, consequently the Hungarians use much less sugar than the peoples to the west and north. They employ honey to a large extent as a sweetener in their national cookery. Frugal and abstemious, almost every landholder has some sort of surplus to sell.

The total marketable surplus of each small holding as well as the relative quantity of products marketed is less than on middle-sized or large holdings. It has been estimated that during the course of 1902 the average small peasant farmer used at home 28.6 per cent of all the animal products and 43.4 per cent of all the field crops produced on his holdings; whereas the middle-sized farmers used at home only 3.2 per cent of his animal products and 2.7 per cent of his field crop production (*14, p. 23*). On small holdings field crops are generally fed at home to a greater extent than on large estates. The marketable surpluses as indicated above are generally in the form of some sort of animal or animal product.[15]

[15] It has been determined that the income from the sale of animals and animal products by owners of holdings of 80 Jochs (114 acres) was three and one-half times as great as the income from the sale of cereals, potatoes, hay, and straw. In similar comparison, the animal industry on holdings of 56 Jochs (80 acres) yielded five times as much as the income derived from the sale of field crops, and on holdings of 28 Jochs (40 acres) the cash income from the animal industry was twenty-two times as great as field crop returns (*15, p. 284*).

The large estates consume as food or as feed for livestock a relatively small percentage of the annual field-crop production and probably a much smaller percentage of the middle-sized holdings, almost the entire crop moving to market shortly after harvesting. The reason for this is that each large estate offers grain of a uniform quality in carload lots—usually several carloads—that can be consigned directly from the railway or river station nearest the estate to some milling center or abroad. Sometimes the middle-sized holdings are large enough to furnish a carload of uniform grain; but usually it is necessary for the buyer to assemble a carload from two or more farmers with some differences as to quality. As regards the product from the small peasant holdings, an inferior and heterogeneous quality is always to be expected.

GRAIN TRADE OF HUNGARY

In ancient times only such acreages of grain were cultivated in Hungary as were required to feed the local population of a district under the jurisdiction of an overlord and to pay the grain tax to the Austrian Empire. There were no railroads. Grain was painfully hauled up the Danube in barges or overland in rude carts to Vienna and other points west and northwest from the Magyar estates.

By the seventeenth century professional grain merchants had begun to handle this mobile surplus and, in 1635, complaints were registered from consumers in Austria (probably Lower Austria), Styria, and Moravia against the charges of these merchants. In 1751, the merchants and producers complained of the exorbitant fees collected by the customhouse agents that absorbed as much as a fourth of the worth of their grain. Some grain was sent to Italy in that century; but there was the complaint that it was not properly cleaned and that it smelled earthy.[16]

During the early part of the nineteenth century the grain trade of Hungary was concentrated in Győr and Moson northwest of Budapest and, during the period in which the United States was recuperating from the Civil War and former Russia was fighting the Crimean War, Hungary became the granary of Europe. The acreage and production of grain increased under the stimulus of high prices.

The Suez Canal, which opened in 1869, exposed Hungary to the competition of India and, beginning with 1873, the export of grain from North America cut heavily into the profits of the Hungarian farmers and the milling industry.

During this middle period of the nineteenth century the milling industry of Hungary assumed great proportions accompanied by the development of the roller-process at Budapest. Beginning with 1835 the Hungarian mills were enabled to ship grain from the Balkan States and to obtain a rebate of the tariff paid, provided that the flour equivalent of such grain was exported within a given period.[17]

Under this system the Hungarian grain dealers maintained agents or business affiliations in the chief grain-producing centers of the Balkans who bought up the better grades of wheat for shipment up the Danube to Budapest. The mill capacity of the capital and other

[16] Formerly grain was stored in Hungary, as it is to-day in many places in the Union of Socialistic Soviet Republics, by digging a hole in the ground, pouring in the grain, and covering it again with earth. It was easy in this way to hide grain from the tax collector. In 1795 it was recommended that the Hungarians line these holes with straw in order to lessen the earthy smell.

[17] This provision continued until 1889.

centers thus developed far beyond the production capacity of the Kingdom.

With the opening of the ship canal at the Iron Gate,[18] Serbia and northeast Bosnia were enabled to ship grain cheaply down the Danube for reexport to western Europe. However, up to the outbreak of the World War, Hungary continued to purchase wheat from Rumania, Serbia, and Bosnia, for its export-flour industry.

Until 1850 the purchase of grain was not a specialized business. Traders supplied the peasantry with salt, seed, woven goods, and other simple articles, and received in barter grain, wool, hides, and other products—whatever the producer had to offer. There was no price and no grade. There were wholesale merchants in Vienna who conducted trade in export grain with central Europe. In other parts of the Austro-Hungarian Empire the grain trade was almost without exception in the hands of small traders.[19]

In the early fifties of the nineteenth century the grain-handling industry of Hungary was organized along the same general lines as in Germany with the main exchange in Budapest and minor exchanges at other important centers. From this time the export-import trade of the Kingdom was conducted more nearly independently of Vienna than had formerly been the case.

There were 51 grain warehouses in the old Kingdom of Hungary, a number of which were maintained by banks, which accepted grain as security for loans much the same as a pawnshop would accept any class of goods. But ordinarily grain is stored in all sorts of temporary warehouses.

The large mills and the warehouses at Budapest are equipped with elevators, but otherwise the grain throughout Hungary is loaded and unloaded in sacks.

There are two general classifications of grain in Hungary: (1) Large-estate grain (Herrschaftsware) and (2) peasant grain (Bauernware). Estate grain is obtainable in large lots, is uniform, clean, and of good quality; whereas peasant grain is marketed in small lots. There is great variation in the quality offered by different peasants, and the grain is indifferently cleaned.

Several varieties of each of the cereals bear trade names significant of the locality in which they are grown and the general standard of excellence for which they are known.

COMMERCIAL GRAIN

Probably more than half of the grain entering Hungarian commerce is produced on the large estates [20] and middle-sized holdings, whereas nearly half (43.4 per cent in 1902) of the field crops of the small holdings does not leave the producers.

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[18] The point at which the Danube River breaks through the Transylvanian Alps, on its passage to the Black Sea, is called the Iron Gate (fig. 1) on account of the narrow gatelike defile through which the river flows in a succession of unnavigable rapids. In 1898, a canal accommodating small ships was constructed about these rapids.

[19] A list of the names of these traders shows not only that the products of Hungary were handled by Armenians, Greeks, Jews, and Serbs but that also Magyars engaged in trading "mit Eifer und Verstandnis (with eagerness and understanding)" (4).

[20] If it is assumed that the small peasants (holdings less than 100 jochs, 142.2 acres each) and estates (holdings more than 100 jochs each) consumed relatively as much of their products on the farm as they did before the World War the marketable surpluses, in 1926 would have been barley, 7,208,000 bushels produced by the peasants as compared with 7,697,000 bushels produced by the estates; oats, 4,630,000 bushels of peasant grain as compared with 7,295,000 produced by the estates; and corn, 9,875,000 bushels of peasant grain as compared with 9,573,000 bushels produced by the estates. The estates consumed relatively a small quantity of the 33,637,000 bushels of wheat and rye produced in 1926, whereas a very large proportion of the 65,578,000 bushels produced by the small peasants did not leave the farm.

Taking Hungary as an illustration of an exporting country, the ultimate disposition of the Hungarian grain crop during the course of any one crop year (August 1 to July 31) is the result of a long and complicated series of reactions between several groups of factors that may be considered as having operated to produce one of two possible results: (1) To cause the wheat to be exported; or (2) to cause the wheat to disappear in some other manner.

The second group of factors includes all those factors that tend to keep wheat off the market; that is, to reduce the quantity of commercial wheat. In this group of factors is the use of wheat as seed. The quantity of seed used from the crop harvested in the summer of any one year for the crop of the next year fluctuates directly with the acreage of the crop of the succeeding year. The seed requirement has always to be met and, under Hungarian conditions, is almost universally, supplied from grain produced on the farm itself although, exceptionally, it is purchased from domestic or imported wheat. There is always a greater or less quantity of unmarketable grain—if not on every farm at least within the country as a whole. The quantity of such grain that is not used for human food and that is customarily fed to livestock fluctuates from season to season and is generally affected by the price receivable by the farmer. When grain is scarce and prices high, there is a tendency on the part of the seller to crowd as much low-grade grain as possible into the marketable grades. The price of grain, on the other hand, might be so low that the farmer would feed all but the choicest portion of his crop. There are also losses at the farm on account of pests, spoiling, and accidental destruction.

Then there is the food requirement of the farmer's family, the feed for his livestock, and the reserve supply to be held at the farm for use in an emergency. Both the food and feeding stuff requirement, as well as the reserve supply, fluctuate from season to season, depending upon the manner in which the farm population of Hungary reacts to the economic and other conditions determining the prices that affect their daily life. This involves the question as to whether it is more to the farmer's advantage to eat or feed a larger part of his grain than had previously been the general practice of his household, or to sell a greater than normal portion.

The manner in which the Hungarian farmer reacts to changes affecting his daily life is governed largely by his racial characteristics; that is, by the customs and habits of the Hungarian nation, which differ materially, for example, from those of the German farmers on the one hand, and from those of the Rumanian peasants on the other. That is to say, a series of reactions tending to keep wheat off the market will be attended by an end result in Hungary characteristic of the Hungarians, whereas a similar series of reactions would not necessarily produce a similar effect in Rumania, where the end result would be typical of the very different racial characteristics of the Rumanian farmers. As a result of all this class of reactions, a certain portion of the wheat crop of every country, whether an exporting or an importing nation, remains immobile each year in contradistinction to the commercial portion of the crop which moves to market.

The acreage devoted to cereal-crop production in Hungary fluctuates relatively little from year to year, and the seed requirement deviates over a more restricted range than does the food and feed

requirement. The relations between crop production and export are considered to be the relation of net production (gross production of a given year less the seed requirement for the crop of the succeeding year) to the net export (gross exports less imports).

When the commercial portion of the crop begins to move from the farms of Hungary, an army of intermediaries appears to speed the grain along only as rapidly and only as far as it is profitable for them to handle it. Village gristmills and customs mills of county seats offer a strong barrier against the movement of wheat beyond local boundaries. Village and provincial bread requirements in Hungary are governed by food habits that are typical of Hungarian racial characteristics, which are distinctly different from the food habits of the Germans or the Rumanians. To supply the local bread and feed requirements, a large part of the local production is withheld from the large market centers where grain is concentrated in large or wholesale quantities. This grain is for the most part consumed as bread for humans and feeding stuffs for livestock, although there are losses all along the line, and always stocks of grain, meal, and flour of varying magnitude are carried over at the end of each season by local merchants and small customs mills.

In Hungary and in other countries in which large estates still operate, there is a marked difference in the quality of peasant and estate grain. Relatively little grain produced on small holdings, which is of low grade and lacks uniformity,[21] flows beyond the local grist and customs mills. Only the best grade finds its way to the large market centers because the large buyers can make a profit only by handling the best. On the other hand, very little estate grain is ground locally, because it is of uniform grade and can be purchased in large quantities. The general quality of the grain produced on each estate in Hungary is known to the buyers, who usually contract for the entire crop in advance so that, as soon as threshed, estate grain begins to move to Budapest or some other large concentration center conveniently situated on the Danube or on some trunk line of commerce, for utilization by the large commercial mills or for export.

Before the World War, many of the large grain-handling firms and mills in the western and northwestern districts of the Austrian Empire maintained agents in the various production centers of the old Kingdom of Hungary to buy up the quantities and particular grades of hard wheat (steel wheat) that they required for blending with their softer local varieties. On the average, before the World War, about one-third of Hungary's wheat export was shipped abroad in the form of grain. About two-thirds of the export wheat was shipped abroad as flour by the great exporting mill combines of Budapest and from certain provincial milling centers, which maintained contacts with selling organizations in Vienna and in other cities of the Austrian Empire as well as in central Europe.

Under conditions of unrestricted commerce, the quantity of grain that the merchants and mills of a surplus country attempt to export

[21] In Hungary, as in most parts of central and southeastern Europe, peasant holdings consist of long narrow strips of land. These strips of land are seeded (broadcasted) by hand. If a peasant plants carefully selected seed it is improbable that his neighbors on the right and left will plant seed of equal quality. It is possible that the neighbor on the right will sow an entirely different kind of crop and the one on the left still another kind. The seed sown by each neighbor scatters over onto the field of the peasant lying between so that when this peasant harvests his grain it is usually of three qualities and may be an admixture of three different cereals. Attempts have been made to correct this evil; but to date these attempts have not been followed by a general reform.

does not take into conscious consideration any particular quantity of grain required for domestic utilization. The exporters attempt to buy up and ship from the country the maximum quantity of wheat that, in their opinion, will give them a profit. These operations are conducted in competition with local mills, which buy and grind for local and general domestic consumption the maximum quantity of wheat that, in their opinion, can be sold at a profit to the native population.

The reactions between cost at shipping point, freights, mill expenses, and the multitude of factors involved in transportation, processing, and merchandising interposed between the date of purchase and the date of final sale determine the accuracy of their guess and eventually fix the quantity handled.

There are two groups of agencies in competition in any surplus-producing country:

(1) The exporting organizations with foreign contacts strive to make the greatest possible profit by shipping abroad a maximum quantity of grain from any possible source. This quantity is modified by certain price considerations.

(2) The local organizations with domestic contacts strive to make as great a profit as possible out of the maximum quantity of grain that the domestic population, also governed by price considerations, will utilize.

Both groups, at the end of any one season, carry over within the country itself stocks of grain, meal, and flour, that fluctuate in magnitude from season to season. The quantity of grain that eventually finds its way abroad, as well as the quantity that disappears each year within the country itself, is the end result of several complex reaction series involving a vast number of fluctuating factors.

Before the World War the flow of grain and flour out of the old Kingdom of Hungary was almost exclusively in the direction of some center of demand in the former Austrian Empire. This flow was facilitated by lack of customs restrictions between the two countries, and the tariff regulations of the Dual Monarchy protected both Austrian and Hungarian grain from the sharpness of world competition. For this reason the annual amount of the grain flow depended upon the pressure of the accumulated supply in Hungary against the restraining barriers of the Hungarian domestic demand, as well as upon the pull or suction of the centers of demand in Austria, tending to break down restraining barriers, not only in Hungary, but in the other sources of supply, from which the deficit districts of the old Austrian Empire drew grain to satisfy their food and feed requirements.

CEREALS

In recent years the cash income of the peasant farmers and estate owners of Hungary has been derived more and more from the sale of animals and animal products. As a source of natural manure, the animal industry has been indispensable to the maintenance of soil fertility; nevertheless cereal production is still the chief occupation of the Hungarian farmer. Among cereals, wheat is outstandingly the most important crop produced.

WHEAT

Before the World War (1909–1913) the acreage seeded to wheat in the territory comprised within the present boundary of Hungary averaged 3,712,000 acres. In 1921–22 this acreage had decreased to 2,888,000 acres. The decrease in the wheat acreage, accompanied by drought, lack of fertilizers, lack of labor and farm power, lack of training on the part of the peasants, and lack of capital, all combined to reduce the net production of wheat during 1921–22 at least 18,000,000 bushels below the pre-war normal, and Hungary exported only 9,091,000 bushels of wheat in the form of grain and flour during the crop year. The following year, although net production increased 2,664,000 bushels, exports fell to about 5,000,000 bushels. (Table 8.) From then on exports more nearly assumed their pre-war importance.

TABLE 8.—*Wheat: Statistical balances of Hungary, old boundary, 1904–5 to 1913–14; new boundary, average 1909–1913, and annual, 1920–21 to 1928–29*

Crop year	Population [1]	Acreage [2]	Seed [3]	Production		Disappearance		Net exports [5]
				Gross [3]	Net [4]	Statistical	Per capita	
Former boundary:	*Number*	*1,000 acres*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Bushels*	*1,000 bushels*
1904–5	19,907,331	9,130	26,349	166,918	120,375			[6] 8,076
1905–6	20,070,524	9,197	26,543	170,588	143,113			[6] 17,805
1906–7	20,233,717	9,520	27,475	207,758	182,428	117,205	5.79	65,223
1907–8	20,396,910	8,777	25,330	130,677	103,335	59,533	2.92	43,802
1908–9	20,560,103	9,474	27,342	165,424	140,030	97,489	4.74	42,541
Average 1906–7 to 1908–9	20,396,910	9,257		167,953	141,931	91,409	4.48	50,522
1909–10	20,723,296	8,799	25,394	125,015	97,959	85,579	4.13	12,380
1910–11	20,886,487	9,375	27,056	181,138	154,696	106,650	5.11	48,046
1911–12	21,049,680	9,162	26,442	190,081	162,448	107,524	5.11	54,924
1912–13	21,212,873	9,575	27,633	184,639	160,013	107,496	5.07	52,517
1913–14	21,376,066	8,533	24,626	167,347	141,771	100,131	4.68	41,640
Average 1909–10 to 1913–14	21,049,680	9,089		169,644	143,377	101,476	4.82	41,901
New boundary: Estimated average 1909–1913	7,606,971	3,712	10,542	71,493	60,951	40,462	5.32	[7] 20,489
1920–21	7,980,143	2,662	7,569	37,927	29,725	29,731	3.73	[8] —6
1921–22	8,065,537	2,888	8,202	52,715	42,713	33,622	4.17	9,091
1922–23	8,141,465	3,522	10,002	54,720	45,377	40,412	4.96	4,965
1923–24	8,221,149	3,293	9,352	67,705	57,768	41,370	5.03	16,398
1924–25	8,274,940	3,499	9,937	51,568	41,560	28,357	3.43	13,203
1925–26	8,368,273	3,524	10,008	71,675	61,150	41,667	4.98	19,483
1926–27	8,443,957	3,706	10,525	74,908	63,488	41,873	4.96	21,615
1927–28	8,519,641	4,021	11,420	76,933	65,195	43,704	5.13	21,491
1928–29	8,595,325	4,133	11,738	92,037	80,299			

[1] Population 1904–1909 estimated by interpolating the increase between 1900 (19,254,559) and 1910 as given in Magyar Statisztikai Évkön. 1915: 7. In 1900 there were 1,964,395 inhabitants in municipalities and 2,338,262 in 1910. 1911–1913 estimated by assuming the increase to be at the same rate as previous years. 1910 population for new boundaries used for 1909–1913 average, and 1920 from Recensement General de la Population de 1920: 28. 1921–1924 estimated by adding births and subtracting deaths as given in Statesman's Year-Book 1926 (*8, p. 986*)–to 1920 population. 1925 from Internatl. Yearbook Agr. Statis. 1926–27: 2. 1926, 1927, and 1928 estimated by assuming that the same average yearly increase had occurred as between 1920 and 1925.

[2] Acreage and production from official records of U. S. Department of Agriculture, Bureau of Agricultural Economics.

[3] Old boundary, 2.886 bushels per acre and new boundary 2.84 bushels per acre (*10, p. 15*).

[4] Seed for acreages the following year subtracted from production for stated year, except average 1909–1913 and annual 1928–29.

[5] Years beginning Aug. 1, 1904–5 to 1913–14, old boundary, from Ann. Internatl. Statis. Agr. 1913–14: 420–427; 1920–21 from Ann. Internatl. Statis. Agr. 1923. 1921–22 to 1927–28 from Internatl. Yearbooks Agr. Statis. 1924–25 and 1927–28. Exports include wheat and wheat flour in terms of grain except as noted.

[6] Does not include wheat flour.

[7] Surplus.

[8] Net imports.

INTERNATIONAL TRADE IN WHEAT

The old Kingdom of Hungary exported (net) on the average 41,901,000 bushels of wheat as grain and flour during the 5-year period ended July 31, 1914. During this period, the wheat and flour exports from the territory now constituting Hungary are estimated to have been equivalent to 20,489,000 bushels of wheat. A large portion of the wheat shipped from the outlying territories of the former Kingdom, which, since the World War, have become parts of Rumania and Yugoslavia, was exported up the Danube as grain to present Czechoslovakia and Austria, whereas most of the wheat shipped from the territories now comprising Hungary was exported as flour.

The drought of 1922 discouraged and even prevented the seeding of winter wheat for the crop of the succeeding season so that the total area of wheat in 1923 fell 229,000 acres below that of the previous year. The harvest of 1923 was comparatively favorable, and the net production of wheat nearly reached the pre-war average. In this year, the Government took direct charge of exports and, although a total of 16,398,000 bushels in the form of wheat and wheat flour was shipped abroad, domestic disappearance of wheat exceeded the pre-war normal. Then came the short crop of 1924. Net production was hardly sufficient to meet the food requirements of the nation. Nevertheless, 13,203,000 bushels of wheat were exported, forcing the city populations to go on very short supplies and the entire nation to resort to substitutes. Per capita disappearance dropped to 3.43 bushels. The harvest of 1925 was exceptionally good; but the agricultural industry and the country as a whole was engulfed in a crisis caused by a sharp decline in prices, illustrated by the rapid fall in the price of wheat during the 12 months ended December 31, 1925, according to the monthly quotations on the Budapest market as indicated in Table 9.

TABLE 9.—*Wheat: Average price in Budapest, by months, January, 1922–December, 1925, and January, 1927–July, 1928*

[See Table 54 for average values of the crown and pengö]

Month	1922		1922–23		1923–24		1924–25		1925–26		1926–27		1927–28	
	Crowns per quintal	Cents per bushel	Crowns per quintal	Cents per bushel	Crowns per quintal	Cents per bushel	Crowns per quintal	Cents per bushel	Crowns per quintal	Cents per bushel	Pengös per quintal	Cents per bushel	Pengös per quintal	Cents per bushel
August			6,853	112	78,020	212	406,406	144	381,677	145	(1)		30.58	145
September			8,082	98	91,216	248	414,450	147	373,177	142	(1)		30.92	147
October			11,252	122	94,776	258	449,263	159	366,227	140	(1)		30.52	145
November			10,398	113	101,263	276	460,677	163	359,200	137	(1)		30.23	144
December			10,360	113	108,198	294	496,823	176	400,833	153	(1)		30.71	146
January	2,312	94	12,454	136	133,568	142	585,917	215	(1)		[2] 33.00	157	31.20	148
February	2,460	100	12,880	140	227,877	205	587,067	224	(1)		[2] 34.00	162	31.72	151
March	2,781	98	16,103	131	310,808	127	522,952	199	(1)		[2] 34.51	164	33.35	159
April	3,140	111	23,587	128	315,469	120	513,787	196	(1)		(1)		33.94	161
May	3,444	122	25,955	141	339,580	120	504,734	192	(1)		[2] 35.00	166	34.15	162
June	3,933	118	33,288	91	312,051	102	519,593	198	(1)		32.04	152	34.20	162
July	5,946	129	51,275	140	358,187	117	419,091	160	(1)		30.13	143	29.41	140

January, 1922, to July, 1928, from Inst. Internatl. de Statis.–Bul. mensuel de l'Office Permanent.

[1] Not available.

[2] End of month. From 3, *p. 71.*

In spite of this decline in wheat prices, the 1926 planting showed an increase over the preceding year and was only 6,000 acres below the 1909–1913 average. Production was higher than before the World War, being 74,908,000 bushels as compared with 71,675,000 in 1925 and an average of 71,493,000 during the 5-year period ended 1913. In 1927 there was a further increase in acreage and production, the former was 309,000 acres above the pre-war average, and the latter was 5,440,000 bushels above it.

Yields per acre were below those obtained before the World War, until the year 1925, when 20.3 bushels of wheat per acre were obtained, as compared with the pre-war average of 19.3 bushels. In 1926, the yield was 20.2 bushels per acre and in 1927, 19.1 bushels.

A comparison of the trade for the calendar year 1925 with that of the preceding year shows a marked increase in the export of wheat followed by a still greater increase during 1926. During 1926 Hungary exported 6,719,937 bushels of wheat to Austria, 4,180,726 bushels to Czechoslovakia, 2,915,264 bushels to Italy, 584,083 bushels to Germany, 292,940 bushels to Poland, and 83,823 bushels to Switzerland. The total export for the calendar year was 14,831,013 bushels, as compared with 8,007,875 bushels in 1925. Thus the rise amounted to about 85 per cent, but against this increased export of wheat stands a sharp decrease in wheat flour exports from 2,153,811 barrels in 1925 to 1,654,862 barrels during 1926. The total export figures for 1925 are from Annual International Statistics of Agriculture, 1925–26; the total export figures for 1926 are from Statisztikai Havi Közlemények, October, December, 1926.

TABLE 10.—*Wheat and wheat flour:* [1] *Imports and exports of Hungary, 1904–5 to 1913–14 and 1919–20 to 1927–28*

Year	Wheat		Wheat flour	
	Imports	Exports	Imports	Exports
Pre-war years:	*Bushels*	*Bushels*	*Barrels*	*Barrels*
1904–5	5,404,867	13,481,276		
1905–6	2,589,755	20,394,898		
1906–7	122,938	24,919,611	72,162	9,055,819
1907–8	449,533	16,221,568	92,762	6,321,496
1908–9	1,903,874	13,672,212	63,371	6,923,951
1909–10	22,405,111	7,525,564	139,732	6,197,252
1910–11	1,277,092	16,531,244	99,840	7,356,984
1911–12	1,331,288	18,609,223	89,938	8,435,784
1912–13	703,767	15,685,788	73,824	8,192,771
1913–14	7,911,773	16,313,996	159,642	7,545,699
Post-war years:				
1919–20	64,966	9,190	105,347	742
1920–21		1,775	53,525	51,823
1921–22	4,380	710,249	242	1,863,620
1922–23	223,455	70,301	141	1,137,580
1923–24	3,715	5,904,169	9	2,332,827
1924–25	649,787	4,739,111	1,698	2,027,243
1925–26	31,407	11,335,947	17	1,817,434
1926–27	592	14,471,604	17	1,587,492
1927–28	1,487	12,005,733	22	2,108,194

1904–5 to 1913–14 from Ann. Internatl. Statis. Agr. 1913–14.
1919–20 and 1920–21 from Ann. Internatl. Statis. Agr. 1922–23.
1921–22 from Ann. Internatl. Statis. Agr. 1924–25.
1922–23 and 1923–24 from Ann. Internatl. Statis. Agr. 1925–26.
1924–25 to 1927–28 from Ann. Internatl. Statis. Agr. 1927–28.
These data can not be considered comparable owing to frontier alterations during the period under review.

[1] Fiscal year Aug. 1 to July 31.

Trade in wheat was fairly brisk during the first half of 1927. The stagnation which had prevailed toward the end of the previous year,

gave place to an animated inquiry toward the end of January. This is explained by the fact that wheat in storage had been exhausted, and both Austria and Czechoslovakia, as well as the Hungarian mills, found it necessary to replenish their wheat supplies. Wheat was quoted at 33 pengös per quintal (157 cents per bushel) at the end of January; at the end of February, at 34 pengös; at the end of March at 34.50 pengös; and at the end of May, at 35 pengös per quintal, on an average of 164 cents per bushel. The world market however did not keep pace with these advances; the Chicago quotation for wheat, in the middle of January, was 143 cents and fell to 137 cents by the middle of February. For this reason Italy canceled a number of her earlier orders in Hungary. In June, the demand for wheat greatly subsided and, under the effect of favorable harvest prospects, prices fell to an average of 32.04 pengös during the month. (Table 9.)

Trade in wheat began at a slow rate immediately after the harvest of 1927. The farmers considered the market prices too low and were in no hurry to market their wheat; but as they needed money the storage of wheat against advances in cash underwent an unusual development.

Throughout the campaign, western markets evinced only a slight interest in Hungarian wheat, and prices remained low throughout the last six months of the year, fluctuating around 145 cents per bushel. On the other hand, the quotation in Chicago fell from 143 cents, on July 15, to 128¾ cents at the end of December; that is, more than 10 per cent. For this reason Hungary was practically excluded from the export trade in wheat, greatly reducing the year's total, which was 23 per cent less than that of 1926, although it exceeded that of 1925. The detailed export data for the year 1927 were as follows: Czechoslovakia, 5,435,805 bushels; Austria, 4,378,361 bushels; Poland, 1,058,902 bushels; Italy, 431,470 bushels; Germany, 107,548 bushels; Switzerland, 12,860 bushels; Yugoslavia, 10,788 bushels; and Rumania, 658 bushels. *(3, p. 71–72.)*

MILLING

Next after Minneapolis, Budapest is said to be the largest milling center in the world. From the standpoint of capital invested, number of persons employed, ready accessibility of raw material needed, value of products, and general importance to the national economic structure of the State, flour milling easily takes first rank over all other industries in residual Hungary, representing fully 50 per cent of the total industrial activity of the country.

The commercial and export industry is centered at Budapest, where the first roller mill in the world is said to have been put into operation. There were 4 great mill combines at the capital, with a total capacity of 937,000 short tons annually. There were some 300 commercial mills scattered throughout the country districts in 1923. Grist and meal were ground for local consumption at several hundred small village mills driven by power from diverse sources.[22]

[22] There were 20,726 mills in the old Kingdom of Hungary in 1906. Of this number 2,040 were modern steam mills and 183 combined steam and water mills. There were 562 motor driven (oil and gas) mills. Windmills had decreased to about 700, and primitive animal-driven mills (trocken muhlen) to 651. Most of the mills were driven by water. Of a total of 16,590 such mills, 7,895 were fitted to grind only corn. These mills were found in the mountainous districts of Slovakia, Seven Mountains, Caras Severin, and Croatia. There were 3,747 water mills fitted to grind wheat and 2,278 specialized in rye. (Die ungarische Mühlen industrie. An article in Magyar Közgazdaság és Kúltura, 1913, p. 12.)

The total capacity of all flour mills in Hungary has been placed at 4,400,000 short tons, whereas the pre-war estimated production of bread grains within the present boundaries of the country was approximately 1,828,530 short tons of wheat and 741,692 short tons of rye. That is, before the World War, all of the locally produced wheat and rye in Hungary would, on the average, have supplied grist to keep the mills of the country running at 58.4 per cent of their registered capacity. It would have been necessary to have imported 1,830,000 short tons of grain, equivalent to about 61,000,000 bushels of wheat, to have kept these mills running at full capacity.

The great commercial flour industry of Hungary was the outgrowth of a demand in central Europe for a flour made from the hard wheat developed under the conditions of climate and soil found on the plains of Hungary called Stahlweizen or steel wheat, which possesses superior milling and baking qualities. The Austro-Hungarian Monarchial Government fostered the industry by perfecting the access of the Budapest mills to the great grain-surplus regions of Crisana and eastern Banat, now parts of Rumania, and of Voivodina, now part of Yugoslavia. On the other hand, this great milling center was favored by special privileges in the protected markets of Galicia, now part of Poland; in Bukovina, now part of Rumania; in Croatia, Slavonia, Slovenia, Bosina, and Dalmatia now parts of Yugoslavia; and in the territories now comprising Czechoslovakia and in those constituting the Republic of Austria including the city of Vienna with a population of nearly 2,000,000.

The boundary lines established by the treaty of Trianon set up customs barriers that have cut off a large percentage of the pre-war supply of raw materials that had formerly been shipped from outlying districts to the mills now located in Hungary. In like manner, these mills have been cut off from fully 42,000,000 consuming population who had formerly looked to Hungary to supply flour to supplement their insufficient local production.

Before the World War, the population of Hungary consumed about 1.4 bushels of rye per capita each year. This is equivalent to 45.7 pounds of rye flour. They also consumed 5.32 bushels of wheat, which is equivalent to 231.7 pounds of wheat flour per capita per annum. The application of these norms to the 1926 population of Hungary indicates that had the pre-war normal bread requirement been consumed the national demand would have been for 978,232 short tons of wheat flour and 192,944 short tons of rye flour, representing about 26.6 per cent of the registered grinding capacity of all Hungarian mills.

The 1926 net production of wheat was equivalent to 1,390,000 short tons of flour [23] and that of rye to 431,000 short tons,[23] or 650,000 short tons more than would have been required to supply the Hungarian population with their pre-war per capita rate of consumption. The capacity of the Hungarian flour mills was thus sufficient not only to grind all of the domestic production of wheat and rye but an additional quantity of grain equivalent to 2,579,000 short tons of flour.

On the basis of the pre-war demand for flour in Hungary, the 1926 requirement would be about 26.6 per cent, whereas local production

[23] It is estimated that 4½ bushels of wheat will mill 1 barrel of wheat flour (196 pounds), and that 6 bushels of rye=1 barrel of rye flour (196 pounds).

in the same year was equivalent to 41.4 per cent of the grinding capacity of the mills located in this territory.

Had Hungarian mills run at full capacity in 1926, they would have been required to import 58.6 per cent of the grain ground and to export at least 73.4 per cent of the flour produced. This is the crux of the present situation.

It is obvious that the economic development of Hungary is closely bound up with the milling industry. The great need of the animal industry of the country is concentrated feeding stuffs, and for this reason alone every pound of grain that can be obtained by the mills should be ground within the country itself, and the resulting bran and other by-products should be fed domestically to increase exportable surpluses of dairy and other animal products and to build up the fertility of the soil. The pursuit of any other policy is practically equivalent to diminishing a chance of future generations having a fair opportunity to earn a livelihood from that soil unless fertility is restored by use of commercial fertilizers.

Instead of pursuing a policy of developing the milling industry and facilitating the exportation of flour, the action taken by the Hungarian Government resulted in forcing the exportation of native wheat and placing the mills in the position where they either had to lie idle or import foreign wheat. Thus, in 1922, the milling industry was stagnated by the imposition of an export tax of 65 quintals of wheat on each 10 metric tons of flour, or 212 bushels for every 100 barrels of flour made from native wheat. Since there was a tax of only 8 quintals (29 bushels) of wheat per 10 metric tons of exported flour made from foreign wheat, the Budapest mills shipped in grain from Manitoba for milling and reexport, leaving domestically produced wheat to be consumed within the country itself or to be exported as grain.

The milling industry had barely adjusted its operation to this tax system when the Government abandoned this plan and levied a tax of 5 per cent on wheat purchased by mills, and an additional tax of 10 per cent was placed on all wheat milled. The foreign exchange obtained from the sale of flour abroad had to be turned over to the central foreign exchange committee at rates less than the regular market quotations. This so discouraged milling that the industry operated at only about one-fourth capacity. Under such conditions the Hungarian mills were unable to hold the markets in central Europe that had formerly been supplied almost exclusively with Hungarian flour, and this product was replaced to a large extent by flour from the United States and other countries. Flour from the United States was sold extensively in Czechoslovakia, Austria, and Dalmatia, where formerly the popular belief had been that no flour was equal to Hungarian for pastry purposes. This belief has been dispelled.

The following year, 1923, the milling industry received a further setback, for, under pressure for funds, the Hungarian Government was forced to take over the export of grain for its own account, greatly to the injury of both the millers and grain merchants of the country.

The Royal Hungarian Ministry for Public Provisioning passed a regulation standardizing flour at a lower grade than formerly was maintained at Budapest, and, thus, practically placed the quality of the flour produced by the Budapest mills on a parity with that produced in the Comitats, to the advantage of the latter. The small mills operate with smaller costs and also buy their grain, for the most

part, in the immediate neighborhood, and therefore at lower prices, and are indeed, in their own districts, the strongest competitors of the great mills. These great mills, at the capital, unable to meet competition in foreign markets on account of being hampered by export taxes in addition to milling taxes, thus found themselves unable to meet home competition on account of freight rates. Severe losses were suffered, both at home and abroad, and the mills became so involved in debts that, in 1925, two great combines went into bankruptcy.

In 1926, the competition of the small mills was carried into Budapest itself. The metropolitan mills worked up 213,053 short tons of wheat and rye, which, including fodder meal, corresponds to about 172,510 short tons of flour. During 1926, a total of 143,078 short tons of wheat flour and rye flour were shipped into Budapest, giving the city a gross supply of 315,588 short tons. Of this amount, 104,215 short tons of flour were exported, of which the Budapest mills supplied 96,215 short tons. This left 211,373 short tons as the net supply of the metropolis, of which only 76,295 short tons were ground by the great mills and 135,078 short tons were shipped in by the smaller, country mills.

The increased difficulty of marketing their products in 1926 reduced the quantity of grain ground by the Budapest mills and more important country mills (that rendered reports) to about 24.3 per cent of their annual grinding capacity.

The following year, two large mills were made over into woodworking plants for house-construction material; two others were transformed into warehouses; and one mill remodeled its machinery to polish rice. Many other mills stood idle during the whole or part of 1927.

The introduction of the 1-phase system of turnover tax—that is, the release of mill products, in traffic outside the mills, from the turnover tax—had also the result that the wholesale trade in flour and mill products, which for the first half of 1927 was almost condemned to inactivity through the still existing 2 per cent turnover tax, began slowly to recover and to share with the mills in the business of trading.

The natural markets for Hungarian flour are those of the two near-by States of Austria and Czechoslovakia, whose production of wheat and rye is insufficient to cover the food requirements of their own populations. Three conflicting sets of interests have developed in each of these countries. The city populations demand cheap bread, the farmers contend for a just compensation for their wheat, and the millers require a margin of profit on their locally produced flour. The sale of flour from the United States and Canada in each of these countries is also firmly established. Thus, in the face of tariffs to protect the farmer and the local miller, as well as the offerings of cheap overseas flour, the Hungarian mills will find it extremely difficult to reestablish themselves in the Alpine Provinces of Austria to the west or in Bohemia, Moravia, and Silesia, where the bulk of the output of the Budapest mills was sold before the World War. It is to the advantage of both Austria and Czechoslovakia, on the west and north, to grind as much wheat as possible within their own frontiers and to import as little flour as possible.

It is to the interest of Yugoslavia, on the south, to export less wheat and to develop its own milling industry sufficiently to supply

the needs of Dalmatia, Bosnia, Herzegovina, Montenegro, Slovenia, and western Croatia. Each of these territories was accustomed, before the World War, to look to Budapest for part of its flour requirement.

The needs of Bukovina, on the east, are now being met by the mills of Rumania, whereas Galicia, to the north, which formerly looked to central Hungary for a portion of its flour requirement, has covered its deficit by purchases at more readily accessible sources of supply, its customs tariffs being prohibitively high for Hungarian products.

The former Hungarian territories of Banat and Crisana, that are now parts of Rumania, possess great mills of their own and under favorable conditions are able to compete with Budapest for western and northern markets.

Hungarian flour has to struggle against high customs protection in nearly every customer country and to meet the competition of flour from 13 or 14 other countries, all of which have to face the fierce competition of the milling industry of the customer country itself.

The Hungarian milling industry will have to find new markets, but whether in Switzerland, Greece, France, or Brazil they will have to meet the competition of the world market. It is improbable that the milling industry of Hungary can recover its former position of importance among the industries of the country. Just as had occurred in Czechoslovakia, it is probable that many mills in Hungary will be abandoned and dismantled. Those mills that survive this crisis will be forced to reorganize their business in the face of strong competition from American flour, which has established a reputation for quality among the bakers and housewives of Europe who formerly held Hungarian flour indispensable to their needs. This reorganization will probably be in the direction of combining the milling interests under fewer administrative units to cut down the costly overhead.

THE RELATION OF PRODUCTION AND DISAPPEARANCE TO THE EXPORT OF WHEAT

In countries of surplus production in southeastern Europe, where the export of cereals is a factor of first importance to the balance sheet of international trade, it is customary for governments to issue, during the summer, statements regarding the probable exportable surplus of wheat, rye, etc., from the crop about to be harvested. These statements are, customarily, calculated from a hypothetical consumption norm based upon averages of past years. Such forecasts may or may not approximate the export that follows the marketing of the crop. Many modifying factors may inject themselves into the situation during the 12 months following the harvest. Among these factors are the price situation as regards wheat and rye in an exporting country in relation to prices in customer and competing countries; fluctuations in exchange rates, shifts in tariffs and trade regulations both at home and abroad; the geographic relation of surplus areas to deficit areas within the country itself and to the consuming centers of customer countries; the relative size of the wheat surplus to the size and price of substitute products such as rye or potatoes. The continual play of changes in these and other factors tends to modify any estimate that may be made regarding the probable domestic requirement and the probable exportable surplus in their relation to the pro-

duction in any given crop year. Nevertheless, there are certain basic principles of relationship existing among production, disappearance, and export that can be expressed mathematically in such a way as to aid in analyzing or at least in visualizing the interplay of factors that affect the movement of farm products across international frontiers.

Production, exportation, and domestic disappearance are quantitative phenomena described by numbers; as, for example, numbers of bushels, barrels, or other units of weight or measure. For that reason, whatever shifts take place in the relationships among these quantities from year to year are reflected by the numerical relationships among the figures that express the quantities of wheat produced, or exported, or that have disappeared. Whenever a distinct or even approximate relationship can be shown, it is a help in analyzing the situation arising out of that relationship if the mathematical expression which describes it is available (*11*).

Domestic disappearance of wheat is the result chiefly of its utilization as human food or as seed, although a variable quantity is always stored. The quantity of seed used from the crop of any given year depends upon the area planted for the crop of the succeeding season. The quantity consumed as human food depends chiefly upon the number of inhabitants or consuming units within the country during the crop year. Usually there is little or no direct relationship between the annual fluctuations in these two groups of factors affecting disappearance of wheat. It has therefore been deemed expedient to consider the relationships of production, exportation, and disappearance from the viewpoint of net production; that is, production less seed (as noted above), in its relations to net exports and consequently to net disappearance. The human element can, also, be taken into numerical considerations and, therefore, the relation of per capita net production (P) to per capita net exports (E) and to per capita net disappearance (D), will be analyzed, in which $P-E=D$.

The relationships that existed among production, export, and disappearance of wheat in the old Kingdom of Hungary during the five years 1909–10 to 1913–14 will be briefly discussed as a background against which to picture the changes which have taken place in the situation following the World War. The figures representing per capita net production and per capita net disappearance for each year of the pre-war period are given in columns 2 and 3 of Table 11.

TABLE 11.—*Wheat: Per capita net production and per capita net disappearance in the old Kingdom of Hungary, 1909–10 to 1913–14*

Crop year	Per capita net production P	Per capita net disappearance D	PD	P^2	D^2
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Bushels*
1909–10	4.73	4.13	19.5349	22.3729	17.0569
1910–11	7.41	5.11	37.8651	54.9081	26.1121
1911–12	7.72	5.11	39.4492	59.5984	26.1121
1912–13	7.54	5.07	38.2278	56.8516	25.7049
1913–14	6.63	4.68	31.0284	43.9569	21.9024
Total (Σ)	34.03	24.10	166.1054	237.6879	116.8884

A casual inspection of the figures under P and D, in Table 11, reveals a relationship between these two sets of variables. In general a year of low production (as in 1909) was associated with a 12-month period of low disappearance, and the year of maximum production (1911) was associated with 12 months during which disappearance was also maximum.

These numbers have been plotted in the scatter diagram, Figure 2, each dot representing the relation between per capita net production and per capita net disappearance. It is evident from this diagram that, in general, the crop years in which production was successively greater than in 1909 were associated with 12-month periods during which disappearance was successively greater than that during the 12 months August 1, 1909, to July 31, 1910.

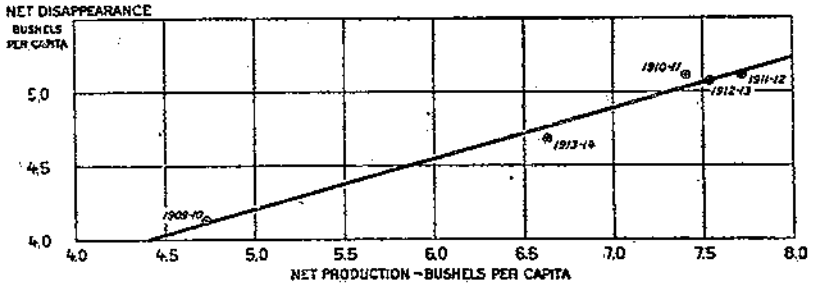

FIGURE 2.—RELATION BETWEEN PER CAPITA NET PRODUCTION AND PER CAPITA NET DISAPPEARANCE OF WHEAT IN THE OLD KINGDOM OF HUNGARY 1909-10 TO 1913-14

Before the World War, the fluctuations in per capita disappearance of wheat in the old Kingdom of Hungary bore a close relationship to fluctuations in production. The trend of this relationship is apparently a straight line.

If the Hungarian people had consumed as food, feed, or seed, or had stored or caused to disappear in some other manner all of the crop each succeeding year so that there was no wheat exported, the ratio of variation between disappearance and production would have been 1 to 1 and every point on a scatter diagram picturing the situation of that year would have been located in a straight line with a slope of 45°. Before the World War, the export organizations of the old Kingdom of Hungary shipped abroad a greater or less quantity of wheat as grain and flour depending upon the availability of the product and the margin of profit involved. This varying export tended to produce a relationship between disappearance and production not in the ratio of 1 to 1 but in the ratio of something less than 1 to 1. During the pre-war period, this relationship was analogous to a trend which apparently (fig. 2) can be represented by a straight line. Such a straight line could be fitted by inspection, but a more accurate result will be obtained if this line is fitted to the points on the scatter diagram by a modification of the method of least squares that brings out the average correlative relationship between the two sets of variables (P) and (D).

This calls for a solution of the following normal equations, which can be solved by substituting numerical values derived from the data as arranged in Table 11:

$$\Sigma\ (D) = na + b\Sigma\ (P)$$

$$\Sigma\ (DP) = a\Sigma\ (P) + b\Sigma\ (P^2)$$[24]

[24] The reader is referred to (*11, pp. 386, 400*) for the discussion of principles.

Substituting gives

$$24.10 = 5a + 34.03b$$

$$166.1054 = 34.03a + 237.6879b$$

Solving,

$$a = 2.49$$

$$b = 0.342$$

The required equation is

$$D' = bP + a$$

$$D' = 0.342P + 2.49$$

The estimated per capita net disappearance under average conditions (D') associated with the production of each crop year in the old Kindgom of Hungary during the period 1909–10 to 1913–14 is given in column 4 in Table 12. These values for D' all fall in the straight line of average relationship plotted in Figure 2.

TABLE 12.—*Wheat: Estimated per capita net disappearance under average conditions contrasted with observed per capita net disappearance in the old Kingdom of Hungary, 1909–10 to 1913–14*

Crop year	Per capita net production P	Production multiplied by ratio of variation bP	Estimated per capita net disappearance under average conditions $bP+a^1=D'$	Observed per capita net disappearance D	Difference between estimated and observed $D-D'$	$(D-D')^2$
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Bushel*	*Bushel*
1909–10	4.73	1.62	4.11	4.13	+0.02	0.0004
1910–11	7.41	1.54	5.03	5.11	+.08	.0064
1911–12	7.72	2.64	5.13	5.11	−.02	.0004
1912–13	7.54	2.58	5.07	5.07	.00	.0000
1913–14	6.63	2.27	4.76	4.68	−.08	.0064
Total (Σ)						.0136

[1] a is an algebraically negative quantity in this case.

If the relationship had been perfect, the observed disappearance associated with each crop year would also lie on the line of average relationship, and the equation could be used as an accurate instrument for determining the disappearance that would be associated with the production of any given year. But the observed disappearances are scattered or dispersed more or less above and below the line of estimated disappearances or the line of average relationship. Confidence in the accuracy with which the equation describes the relationship between disappearance and production for this particular period of years depends upon the amount of this scattering or dispersion, expressed as an average, which may be called the standard error of estimate, represented by the symbol S.

In computing S, we must know the normal value of D' (as given in column 4 of Table 12), which corresponds with the production of each crop year, P. The difference between the actually observed per capita net disappearance D and the normally to be expected disappearance

under average conditions $(D-D')$ may then be determined. The root-mean-square of these deviations $\pm\sqrt{\frac{\Sigma(D-D')^2}{n}}$ is the required measure of dispersion.

Substituting gives

$$S=\pm\sqrt{\frac{0.0136}{5}}$$

$$S=\pm 0.052154$$

This means, if the distribution of observed disappearance is normal, that about 68 per cent of all cases will range within a vertical distance equivalent to 0.052 bushel above or below the line of average relationship, about 95 per cent will fall within a range of $\pm 2\ S$ (in this case ± 0.104 bushels), and 99 per cent will fall within a range of $\pm 3\ S$ (in this case ± 0.156 bushels (*11*)).

During the pre-war period, the population of the old Kingdom of Hungary averaged 21,050,000, whose wheat requirement, as measured by statistical disappearance, averaged 101,476,000 bushels. If the average relationship, outlined above, had been employed to estimate disappearance this estimate would be expected to approximate the calculated disappearance within a range of $\pm 3{,}300{,}000$ bushels more or less or within 3.3 per cent in 99 cases out of 100. In 95 per cent of all cases, the range would probably have been about $\pm 2{,}200{,}000$ bushels or 2.2 per cent; whereas, in about two-thirds of all cases, the range would have been about $\pm 1{,}100{,}000$ bushels or 1.1 per cent. The maximum difference between estimated and observed pre-war disappearance (Table 12, column 5) was ± 0.08 bushel per capita; which was averagely equivalent to 1,684,000 bushels or 1.7 per cent.

The pre-war export trade in wheat in Hungary was even better organized than the domestic sale of flour and bread, and for that reason, as indicated in Table 13; and in Figure 3, there was a close relationship between production and export. As a rule the Hungarian people consumed more wheat in years of high production than averagely customary; but they also exported more. In years of less than average production they consumed and exported less than an average amount of wheat.

TABLE 13.—*Wheat: Per capita net production and per capita net export in the old Kingdom of Hungary, 1909–10 to 1913–14*

Crop year	Per capita net production P	Per capita net export E	EP	P^2	E^2
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Bushels*
1909–10	4.73	0.60	2.8380	22.3729	0.3600
1910–11	7.41	2.33	17.0433	54.9081	5.2900
1911–12	7.72	2.61	20.1492	59.5984	6.8121
1912–13	7.54	2.47	18.6238	56.8516	6.1009
1913–14	6.63	1.95	12.9285	43.9569	3.8025
Total (Σ)	34.03	9.93	71.5825	237.6879	22.3655

The normal equations descriptive of the relationship of production to export are the same as those pertaining to production and disappearance, except that E is substituted for D, thus:

$$\Sigma(E) = na + b\Sigma(P)$$

$$\Sigma(EP) = a\Sigma(P) + b\Sigma(P^2)$$

Substituting values from Table 13 gives

$$9.93 = 5a + 34.03b$$

$$71.5825 = 34.03a + 237.6879b$$

$$a = -2.49$$

$$b = 0.658$$

$$E' = 0.658P - 2.49$$

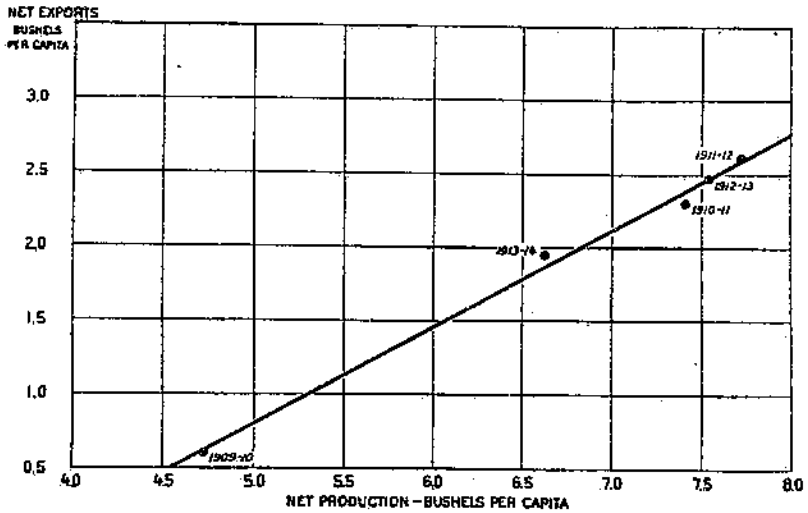

FIGURE 3.—RELATION BETWEEN PER CAPITA NET PRODUCTION AND PER CAPITA NET EXPORTS OF WHEAT IN THE OLD KINGDOM OF HUNGARY 1909-1910 TO 1913-14

Before the World War, fluctuations in per capita net exports from the old Kingdom of Hungary tended to bear as close or casual relationship to fluctuations in production, as did the fluctuations in per capita net disappearance. (Fig. 2.)

The estimated per capita net export under average conditions (E') coincident with the production of each crop year in the old Kingdom of Hungary during the period 1909–10 to 1913–14 is given in column 4 in Table 14. These values for E' all fall in the straight line of average relationship plotted in Figure 3.

TABLE 14.—*Wheat: Estimated per capita net export under average conditions contrasted with observed per capita net disappearance in the old Kingdom of Hungary, 1909–10 to 1913–14*

Crop year	Per capita net production P	Production multiplied by ratio of variation bP	Estimated per capita net export under average conditions $bP+a^1=E'$	Observed per capita net export E	Difference between estimated and observed $E-E'$	$(E-E')^2$
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Bushel*	*Bushel*
1909–10	4.73	3.11	0.62	0.60	−0.02	0.0004
1910–11	7.41	4.87	2.38	2.30	−.08	.0064
1911–12	7.72	5.08	2.59	2.61	+.02	.0004
1912–13	7.54	4.96	2.47	2.47	.00	.0000
1913–14	6.63	4.30	1.87	1.95	+.08	.0064
Total (Σ)						.0136

[1] a is an algebraically negative quantity in this case.

Substituting in the equation $S = \pm\sqrt{\frac{\Sigma(E-E')^2}{n}}$ gives:

$$S = \pm\sqrt{\frac{0.0136}{5}}$$

$$S = \pm 0.052$$

The standard error of estimate in the case of exports is identical with that in the case of disappearance in the old Kingdom of Hungary before the World War. As in the case of per capita net disappearance, this indicates that in about two-thirds of all cases, under pre-war conditions, per capita net export could be expected to range about 1,100,000 bushels above or below that estimated by the equations here given. Before the World War the old Kingdom exported 41,901,000 bushels of wheat as grain and flour, and the range of 1,100,000 bushels represents 2.6 per cent of the average export. The maximum difference between estimated and observed pre-war exports (Table 14, column 5) was ±0.08 bushel per capita; which was an equivalent to 1,684,000 bushels, or 4 per cent.

If history repeated itself, this sort of analysis of the relations of production to disappearance and exportation would predict with mathematical precision the disposition of the wheat crop to be expected, on an average, for any current year. Sometimes history does repeat itself, expecially during a period of settled food habits and commercial procedure. In such countries as pre-war Hungary, France, and Rumania, conditions of production and disappearance ranged within rather well-defined limits for several years in succession so that during those years an analysis of data pertaining to production, international trade, and disappearance, similar to that outlined above, might give dependable results.

But changed conditions are followed by changes in the relationships of disappearance to production so that these relationships may become strikingly different from those that have been typical of preceding periods. The upheaval of the World War has, naturally, been followed by fundamental changes in the relationships of production to the ultimate disposition of the crop.

In the first place, Hungary was partitioned; then the country passed through a governmental crisis, followed by a series of financial disturbances. The Government even undertook to supervise the grain trade and a Ministry of Public Provisioning undertook to regulate the manner in which the population nourished itself. However, when the averages of per capita production, exportation, and disappearance in Hungary, present boundary, for the five years 1922–23 to 1926–27 (Table 15) are compared with those of the old Kingdom for the 5-year period 1909–10 to 1913–14, the differences are not great. The per capita net production of wheat in the old Kingdom before the World War was 6.81 bushels, as compared with the post-war average for residual Hungary of 6.49 bushels. The pre-war per capita net exports averaged 1.99, as compared with 1.82 for the post-war period. Per capita net diappearance of the old Kingdom averaged 4.82 bushels during 1909–10 to 1913–14, as compared with an average of 4.67 bushels during 1922–23 to 1926–27 in present-day Hungary.

TABLE 15.—*Wheat: Per capita net production, export and disappearance, old Kingdom of Hungary, 1909–10 to 1913–14, and Hungary present boundary, 1920–21 to 1926–27*

Crop year	Per capita net		
	Production *P*	Export *E*	Disappearance *D*
Old Kingdom of Hungary:	*Bushels*	*Bushels*	*Bushels*
1909–10	4.73	0.60	4.13
1910–11	7.41	2.30	5.11
1911–12	7.72	2.61	5.11
1912–13	7.54	2.47	5.07
1913–14	6.63	1.95	4.68
Average 1909–10 to 1913–14	6.81	1.99	4.82
Hungary present boundary:			
1920–21	3.72	0.01	3.73
1921–22	5.30	1.13	4.17
1922–23	5.67	0.01	4.96
1923–24	7.09	2.00	5.03
1924–25	5.02	1.60	3.42
1925–26	7.31	2.33	4.98
1926–27	7.52	2.56	4.96
Average 1922–23 to 1926–27	6.49	1.82	4.67

A superficial inspection of the figures in Table 15 reveals a close relationship between production (*P*) and export (*E*), in Hungary, present boundary, whereas there is apparently little relationship between (*P*) and (*D*). The crop year 1924–25 is an exception. In 1922, the Hungarian Government took direct charge of exportations, and by 1923 the Government's buying organization was perfected to ship the largest possible quantity of wheat and flour out of the country. Although the crop of the year 1924–25 was very poor, the Government's buying organization purchased and exported nearly the same quantity of wheat and flour that they shipped abroad during 1923–24, leaving the nation to go on short rations, as there had also been a sharp falling off in the production of rye. This created an abnormal situation in the relationships of disappearance and export to the production of that crop year.

Under the conditions prevailing in Hungary during the four seasons 1922–23, 1923–24, 1925–26, and 1926–27 the Government, and those organizations that operated under governmental regulations, tended to leave within the country for domestic utilization about the same minimum quantities of wheat and flour each season and exported as much of the surplus as possible so that this exported quantity was necessarily very nearly proportional to the production.

The postwar trend in disappearance and export is therefore best described by the relationships of this group of variables if the low disappearance under the abnormal conditions of 1924–25 is excluded. The relationships between production and export for the four remaining years are indicated in Table 16.

TABLE 16.—*Wheat: Per capita net production and per capita net export in Hungary, present boundary, 1922–23, 1923–24, 1925–26, 1926–27*

Crop year	Per capita net production P	Per capita net exports E	EP	P^2	E^2
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Bushels*
1922–23	5.57	0.61	3.3977	31.0249	0.3721
1923–24	7.03	2.00	14.0600	49.4209	4.0000
1925–26	7.31	2.33	17.0323	53.4361	5.4289
1926–27	7.52	2.56	19.2512	56.5504	6.5536
Total (Σ)	27.43	7.50	53.7412	190.4323	16.3546

If the totals of the columns in Table 16 are substituted in the normal equations, given on page 37, it is seen that:

$$E' = 0.9909\ P - 4.92$$

This means that, during the four crop years 1922–23, 1923–24, 1925–26, and 1926–27, a given per capita net production (P) was accompanied, on an average, by a per capita net export equivalent to 99.09 per cent of (P) minus 4.92 bushels.

The estimated per capita net export of wheat under average conditions (E') coincident with the per capita net production of each of the four crop years under consideration is given in column 4 in Table 17. These values for (E') all fall in the straight line of average relationship plotted in Figure 4.

TABLE 17.—*Wheat: Estimated per capita net export under average conditions contrasted with observed per capita net export in Hungary, present boundary, 1922–23, 1923–24, 1925–26, and 1926–27*

Crop year	Per capita net production P	Production multiplied by ratio of variation bP	Estimated per capita net export under average conditions $bP+a^1=E'$	Observed per capita net export E	Difference between estimated and observed $E-E'$	$(E-E')^2$
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Bushel*	*Bushel*
1922–23	5.57	5.52	0.60	0.61	+0.01	0.0001
1923–24	7.03	6.97	2.05	2.00	− .05	.0025
1925–26	7.31	7.24	2.32	2.33	+ .01	.0001
1926–27	7.52	7.45	2.53	2.56	+ .03	.0009
Total (Σ)						.0036

[1] a is an algebraically negative quantity in this case.

The standard error of estimate is found by substituting in the equation $S = \pm\sqrt{\frac{\Sigma (E-E')^2}{n}}$ gives:

$$S = \pm\sqrt{\frac{0.0036}{4}}$$

$$S = \pm 0.03$$

This means that in about two-thirds of all cases in which the average conditions of these four years prevail, the export, estimated by the equation $E' = 0.9909\ P - 4.92$, should approximate the observed export—within a range of 0.03 bushel per capita.

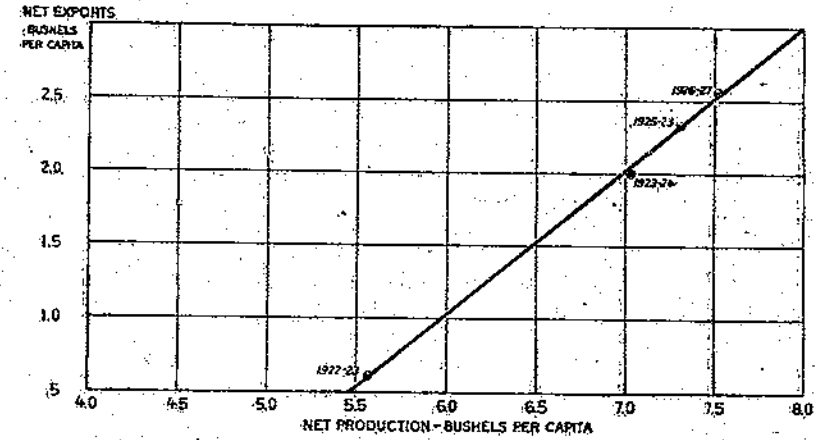

FIGURE 4.—RELATION BETWEEN PER CAPITA NET PRODUCTION AND PER CAPITA NET EXPORTS OF WHEAT IN RESIDUAL HUNGARY, 1922-23, 1923-24, 1925-26, AND 1926-27

During the four years, 1922–23, 1923–24, 1925–26, and 1926–27 per capita net disappearance in residual Hungary tended to remain of a very nearly constant level so that the fluctuations in per capita net exports tended to bear an almost direct proportional relationship to the fluctuations in production.

If the conditions prevailing during the season 1927–28 did not differ materially from the average conditions that prevailed during this 4-year period, there would be a chance of 68 to 100 that the relations between production and exportation during 1927–28 would be similar within the margin of ± 0.03 bushel per capita to the average relations that existed between production and exportation during the period. Any estimate based upon the above probability could be expected to hold true only in so far as actual conditions of the crop year 1927–28 approximated average conditions. A material change in any of the factors involved would produce a change in result, causing the actual per capita net exports to deviate from the calculated net exports or expectancy by a margin greater than the calculated value of $S = \pm 0.03$ bushel per capita, as was the case in 1923–24.

The net production of wheat in Hungary, 1927, was 7.65 bushels per capita. The estimated per capita net export under average

conditions for the crop year 1927–28 is found by substituting in the normal equation above; which gives

$$E' = 7.65 \times 0.9909 - 4.92$$

$$E' = 2.66$$

The probable per capita net export under average conditions for the year 1927–28 is, thus, estimated to be 2.66 bushels. Multiplying 8,520,000, the estimated population of Hungary for 1927–28, by 2.66 bushels gives 22,663,000 bushels as the net export to be expected during 1927–28 if average conditions prevailed.

Preliminary reports for the 12 months ended July 31, 1928, indicate net exports of wheat and flour from residual Hungary, in terms of wheat, to be approximately 21,491,000 bushels or 1,172,000 bushels below the estimated expectancy under average conditions.

Under the average conditions of the four years 1922–23, 1923–24, 1925–26, and 1926–27 there was a probability of about 68 to 100 that the observed export would approximate the estimated export within a range of ±0.03 bushel per capita or ±256,000 bushels. There was a probability of 95 to 100 that the range would fall within ±511,000 bushels and a probability of 99 to 100 that the range would be not greater than ±767,000 bushels.

The fact that the actual exports from Hungary during 1927–28 fluctuated 405,000 bushels below the lower level of expectancy is associated with the relative price levels in Hungary, Austria, and Czechoslovakia. This downward fluctuation is, also, associated with the shortage of the domestic rye crop and relatively high rye prices, which probably increased the domestic demand for wheat.

During 1926 the average price of domestic wheat in Budapest was equivalent to $1.51 per bushel, as compared with $1.57 in Vienna and $1.77 in Prague; and wheat moved up the Danube to Austria and Czechoslovakia. The average price relationships during 1927 were $1.52 in Budapest, $1.57 in Vienna, and $1.93 in Prague. The margin between the price of wheat in Hungary and that in the upper Danube States narrowed toward the close of the year and wheat moved more slowly toward Czechoslovakia and not at all toward Vienna, where, during the first three months of 1928, the average price was equivalent to $1.53 per bushel, as compared with $1.53 in Budapest. The price of wheat improved steadily during April, May, and June, but during these months Czechoslovakia offered a better price for rye on a weight basis than for wheat. Consequently an abnormal situation was created. The exports of rye greatly exceeded expectancy, whereas less wheat was exported than might have been expected from the increased production of 1927. At the same time domestic disappearance of wheat reached the highest point since the World War. Rye and wheat are so intimately associated in the dietary and trade of central Europe that the situations in wheat can not be described without taking into consideration the situation in rye.

TABLE 18.—*Wheat: Acreage and production in Hungary, 1877–1928*

Year	Hungary (proper)			Croatia and Slavonia			Total Hungary		
	Acreage	Production	Yield per acre	Acreage	Production	Yield per acre	Acreage	Production	Yield per acre
	1,000 acres	*1,000 bushels*	*Bushels*	*1,000 acres*	*1,000 bushels*	*Bushels*	*1,000 acres*	*1,000 bushels*	*Bushels*
Pre-war year:									
1877	5,972	[1] 76,910	12.88	.....	.....	.....	5,972	76,910	12.88
1878	6,185	[1] 108,619	17.56	.....	.....	.....	6,185	108,619	17.56
1879	6,091	[1] 52,217	8.57	.....	.....	.....	6,091	52,217	8.57
1880	5,958	[1] 79,325	13.31	.....	.....	.....	5,958	79,325	13.31
1881	6,262	[1] 88,897	14.20	.....	.....	.....	6,262	88,897	14.20
1882	6,163	[1] 131,757	21.38	.....	.....	.....	6,163	131,757	21.38
1883	6,437	[1] 90,548	14.07	.....	.....	.....	6,437	90,548	14.07
1884	6,798	[1] 107,217	15.77	.....	.....	.....	6,798	107,217	15.77
1885	6,773	114,735	16.94	400	5,324	13.31	7,173	120,059	16.74
1886	6,830	103,701	15.18	400	5,328	13.32	7,230	109,029	15.08
1887	6,862	147,161	21.45	415	5,346	12.88	7,277	152,507	20.96
1888	6,845	136,999	20.01	427	6,015	14.09	7,272	143,005	19.67
1889	7,193	94,313	13.11	445	4,920	11.06	7,638	99,233	12.99
1890	7,381	149,318	20.29	465	6,790	14.60	7,826	156,108	19.95
1891	7,443	140,470	18.87	487	6,662	13.68	7,930	147,132	18.55
1892	7,571	143,773	18.99	516	7,139	13.84	8,087	150,912	18.66
1893	8,100	160,612	19.83	549	8,201	14.94	8,649	168,813	19.52
1894	7,917	145,588	18.39	566	8,837	15.61	8,483	154,425	18.20
1895	7,742	163,291	21.09	561	8,583	15.30	8,303	171,874	20.70
1896	7,724	151,643	19.63	586	9,575	16.34	8,310	161,218	19.40
1897	6,869	81,074	11.80	576	6,140	10.66	7,445	87,214	11.71
1898	7,554	128,227	16.97	605	11,409	18.86	8,159	139,636	17.11
1899	7,803	141,285	18.11	635	9,013	14.19	8,438	150,298	17.81
1900	8,142	141,201	17.34	665	11,034	16.59	8,807	152,235	17.29
1901	8,196	123,935	15.12	670	10,692	15.96	8,866	134,627	15.18
1902	8,263	170,882	20.68	687	12,019	17.49	8,950	182,901	20.44
1903	8,513	161,954	19.02	714	14,664	20.54	9,227	176,618	19.14
1904	8,401	137,078	16.32	729	9,840	13.50	9,130	146,918	16.09
1905	8,443	157,511	18.66	754	13,077	17.34	9,197	170,588	18.55
1906	8,784	197,407	22.47	736	10,351	14.06	9,520	207,758	21.82
1907	8,069	120,507	14.93	708	10,170	14.36	8,777	130,677	14.89
1908	8,715	152,204	17.46	759	13,220	17.42	9,474	165,424	17.46
1909	8,036	113,353	14.11	763	11,662	15.28	8,799	125,015	14.21
1910	8,584	169,703	19.77	791	11,435	14.46	9,375	181,138	19.32
1911	8,354	174,891	20.94	808	15,190	18.80	9,162	190,081	20.75
1912	8,748	173,326	19.81	827	11,313	13.68	9,575	184,639	19.28
1913	7,700	151,349	19.66	833	15,996	19.21	8,533	167,347	19.61
War years:									
1914	8,016	105,240	13.13	846	12,537	14.82	8,862	117,777	13.29
1915	8,081	148,755	18.41	798	8,892	11.14	8,879	157,647	17.76
1916	7,628	112,253	14.72	764	8,209	10.74	8,392	120,462	14.35
1917	7,826	123,231	15.75	[3]	[3]	.....	7,826	123,231	15.75
1918	7,678	95,095	12.39	[3]	[3]	.....	7,678	95,095	12.39
Post-war years:									
1919	[4]	[4]	[4]	[4]	[4]	.....	[4]	[4]	[4]
1920	2,662	37,927	14.25	[4]	[4]	.....	2,662	37,927	14.25
1921	2,888	52,715	18.25	[4]	[4]	.....	2,888	52,715	18.25
1922	3,522	54,729	15.54	[4]	[4]	.....	3,522	54,729	15.54
1923	3,293	67,705	20.56	[4]	[4]	.....	3,293	67,705	20.56
1924	3,499	51,568	14.74	[4]	[4]	.....	3,499	51,568	14.74
1925	3,524	71,675	20.34	[4]	[4]	.....	3,524	71,675	20.34
1926	3,706	74,908	20.21	[4]	[4]	.....	3,706	74,908	20.21
1927	4,021	76,933	19.13	[4]	[4]	.....	4,021	76,933	19.13
1928	4,133	92,037	22.27	[4]	[4]	.....	4,133	92,037	22.27

Acreage and production:
1877–1896 from Das Getreide in Weltverkehr, Austria 1900: 50–53.
1897–1904 from Das Getreide in Weltverkehr, Austria 1905: 20–21.
1905–1906 from Das Getreide in Weltverkehr, Austria 1909: 16–17.
1907–1908 from Magyar Statisztikai Évkön. 1910: 100–101.
1909–1912 from Magyar Statisztikai Évkön. 1913: 87–88.
1913–1915 from Magyar Statisztikai Évkön. 1915: 86–87.
1916–1918 from Ann. Statis. Hongrois 1916, 1917, 1918: 40–44, 47–52.
1920 from Ann. Statis. Hongrois 1919-1922: 56, 60.
1921–1928 from official records of U. S. Department of Agriculture, Bureau of Agricultural Economics.

[1] Winchester bushels converted from hectoliters. [3] Ceded to Yugoslavia. [4] Not available.

RYE

Before the World War the territories comprised within the present boundaries of Hungary seeded 1,608,000 acres of rye. In 1921, there were only 1,341,000 acres under rye, since which time acreage increased to 1,729,000 acres in 1926, falling off to 1,641,000 in 1928.

Post-war yields per acre have averaged (1922–1926) about 17.06 bushels, as compared with an average of 19.51 bushels during 1909–1913. The year 1927 was not favorable to rye production, and the yield per acre fell off to 13.5 bushels.

Net production, except for the years 1925 and 1928, have not come up to the pre-war average. On the other hand, per capita disappearance has averaged about one-half bushel greater than was normal before the World War. These varying factors have resulted in a falling off in the exportable surplus. As indicated in Table 19, the exports in 1925–26, the season of post-war maximum production were only 6,950,000 bushels, or about 44 per cent of the surplus estimated to have been available for export before the war. The exportation of rye from Hungary has, however, been somewhat irregular, as evidenced by the fact that although the production of 1926 was somewhat lower than that of 1925 the net exports of 1926–27 were over 3,000,000 bushels greater than those during the preceding season.

TABLE 19.—*Rye: Statistical balances of Hungary, old boundary, 1904–5 to 1913–14; new boundary, average 1909–1913, and annual, 1920–21 to 1928–29*

Crop year	Acreage [1]	Seed [2]	Production		Disappearance		Net exports [3]
			Gross [1]	Net [2]	Statistical	Per capita [4]	
	1,000 acres	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Bushels*	*1,000 bushels*
Former boundary:							
1904–5	2,778	8,556	45,918	37,279	----------	----------	[5] 6,871
1905–6	2,805	8,639	53,079	44,403	----------	----------	[5] 10,909
1906–7	2,817	8,676	53,879	45,772	30,500	1.51	15,272
1907–8	2,632	8,107	41,581	33,111	21,092	1.03	12,019
1908–9	2,750	8,470	47,705	39,518	28,868	1.40	10,650
Average 1906–7 to 1908–9	2,756	----------	48,432	40,018	26,820	1.31	12,647
1909–10	2,658	8,187	47,246	38,588	27,618	1.33	10,970
1910–11	2,810	8,658	51,792	43,374	28,302	1.36	15,072
1911–12	2,733	8,418	50,328	40,649	25,532	1.21	16,117
1912–13	2,818	8,679	53,194	44,804	32,672	1.54	12,132
1913–14	2,724	8,390	52,697	43,891	28,135	1.32	15,755
Average 1909–10 to 1913–14	2,749	----------	51,051	42,461	28,452	1.35	14,009
New boundary:							
Estimated average 1909–1913	[7] 1,608	4,888	[7] 31,377	26,489	10,663	[8] 1.40	[9] 15,826
1920–21	1,475	4,484	20,248	16,171	15,324	1.92	[10] 847
1921–22	1,341	4,077	23,177	18,121	15,698	1.95	[10] 2,423
1922–23	1,663	5,056	25,147	20,222	17,650	2.17	[10] 2,572
1923–24	1,620	4,925	31,274	26,294	20,430	2.49	[10] 5,854
1924–25	1,528	4,980	22,103	16,938	11,416	1.38	[11] 5,522
1925–26	1,692	5,165	32,526	27,270	20,320	2.43	[11] 6,950
1926–27	1,739	5,256	31,416	26,279	16,139	1.91	[11] 10,240
1927–28	1,657	5,037	22,365	17,376	12,905	1.51	[11] 4,471
1928–29	1,641	4,989	32,528	27,539	----------	----------	----------

[1] Acreage and production from official records of U. S. Department of Agriculture, Bureau of Agricultural Economics.

[2] 3.08 bushels per acre for old boundary and 3.04 bushels per acre for new boundary (*10 p. 18*).

[3] Seed for acreage the following year subtracted from production for stated year, except average 1909–1913 and annual 1928–29.

[4] For populations see Table 8.

[5] Years beginning Aug. 1, 1904–5 to 1913–14 from Ann. Internatl. Statis. Agr. 1913–14: 429–431.

[6] Does not include rye flour.

[7] Acreage and production calculated from Magyar Statisztikai Évkön. 1909–1913.

[8] Includes Budapest. The estimated per capita consumption in Budapest was 1.34 bushels per year. The rural population is estimated to have consumed about 1.41 bushels of rye.

[9] Surplus.

[10] Net exports of rye for years beginning Aug. 1 and net exports of rye flour estimated by taking the average of the two calendar years from Internatl. Yearbook Agr. Statis., 1923, 1924–25 and 1926–27.

[11] Net exports of rye for years beginning Aug. 1 and net exports of rye flour for years beginning July 1 from Internatl. Yearbook Agr. Statis. 1927–28.

Although the acreage of rye, since 1922, has been in excess of the pre-war average of 1,608,000 acres, it is improbable that there will be any marked expansion above the 1926 area of 1,729,000 acres. Rye acreage in Hungary has probably been slightly affected by the land reform but probably more by the pressure brought to bear by the Ministry of Public Provisioning to increase the use of rye as a wheat substitute in making bread. It is probable that some of the present rye acreage is marginal so that when governmental stimulus is removed acreage may decrease.

INTERNATIONAL TRADE IN RYE

The old Kingdom of Hungary exported (net) on the average 14,009,000 bushels of rye as grain and flour during the 5-year period ended July 31, 1914. During this period the rye and rye-flour exports from the territory now constituting Hungary are estimated to have been equivalent to 15,826,000 bushels. A part of this surplus produced in the central part of the old Kingdom was shipped to deficit areas of Crotia and Slavonia, and the balance went chiefly to cover the deficits of present-day Austria and the northwestern districts of present day Czechoslovakia.

Both before and since the World War, the export of rye from Hungary fluctuated widely, corresponding with fluctuations in production. By far the greater part of Hungary's rye exports are in the form of grain. (Table 20.)

TABLE 20.—*Rye and rye flour: Imports and exports of Hungary, 1904–5 to 1913–14 and 1919–20 to 1927–28*

Year	Rye		Rye flour	
	Imports	Exports	Imports	Exports
	Bushels	*Bushels*	*Barrels*	*Barrels*
Pre-war years:				
1904–5	98, 172	6, 968, 918		
1905–6	20, 479	10, 929, 860		
1906–7	12, 354	12, 427, 039	11, 354	487, 554
1907–8	19, 822	9, 477, 591	9, 698	436, 540
1908–9	16, 058	7, 991, 006	12, 225	458, 063
1909–10	24, 609	9, 112, 234	20, 069	333, 842
1910–11	15, 609	12, 580, 156	20, 910	438, 909
1911–12	20, 637	12, 688, 504	20, 107	595, 026
1912–13	18, 133	9, 259, 383	17, 689	499, 351
1913–14	23, 030	11, 339, 966	20, 711	760, 445
Post-war years:				
1919–20		5, 830		1, 792
1920–21				
1921–22	7, 118	34, 329		
1922–23	1, 559	20, 933		
1923–24	409	3, 804, 163		
1924–25	4, 295	4, 055, 885	[1] 1, 491	[1] 246, 552
1925–26	228	6, 079, 196	[1] 66	[1] 145, 203
1926–27	921	9, 570, 224	[1] 87	[1] 111, 799
1927–28	1, 527	5, 876, 597	[1] 26	[1] 109, 307

1904–5 to 1913–14 from Ann. Internatl. Statis. Agr. 1913–14.
1919–20 and 1920–21 from Ann. Internatl. Statis. Agr. 1922–23.
1921–22 from Ann. Internatl. Statis. Agr. 1924–25.
1922–23 and 1923–24 from Ann. Internatl. Statis. Agr. 1925–26.
1924–25 to 1927–28 from Ann. Internatl. Statis. Agr. 1927–28.
These data can not be considered comparable owing to frontier alterations during the period under review.

[1] Fiscal year July 1 to June 30.

During the calendar year 1926, 51 per cent of all rye exports went to Austria, 25 per cent to Czechoslovakia, 13 per cent to Germany,

5 per cent to Italy, and the remaining 6 per cent went to other countries including Poland, Belgium, Holland, France, and Switzerland.

During the calendar year 1927, the following quantities of rye were exported: To Austria, 2,942,000 bushels; to Czechoslovakia, 1,785,000 bushels; to Poland, 348,000 bushels; to Germany, 267,000 bushels; to Italy, 66,000 bushels.

THE RELATION OF PRODUCTION AND DISAPPEARANCE TO THE EXPORT OF RYE

As in the case of the wheat industry, the World War produced profound changes in the relationships of production and disappearance to the export of rye. The treaty of Trianon segregated the eastern and southern districts, in which both production and consumption of rye were low. Hungary produced 3.02 bushels of rye per capita, during the 5-year period 1922–23 to 1926–27, as compared with 2.02 bushels in the old Kingdom before the World War. Disappearance averaged 2.25 bushels per capita during these post-war years, as compared with the pre-war average disappearance of 1.35 bushels. Net exports averaged one-tenth of a bushel per capita greater in Hungary during 1922-23 to 1926–27 than in the old Kingdom during 1909–10 to 1913–14. (Table 21.)

TABLE 21.—*Rye: Per capita net production, export, and disappearance, average old Kingdom of Hungary, 1909–10 to 1913–14 and annual, Hungary present boundary, 1920–21 to 1926–27*

Crop year	Per capita net		
	Production *P*	Export *E*	Disappearance *D*
Old Kingdom of Hungary:	*Bushels*	*Bushels*	*Bushels*
1909–10	1.86	0.53	1.33
1910–11	2.08	.72	1.36
1911–12	1.98	.77	1.21
1912–13	2.11	.57	1.54
1913–14	2.05	.73	1.32
Average 1909–10 to 1913–14	2.02	.67	1.35
Hungary, present boundary:			
1920–21	2.03	.11	1.92
1921–22	2.25	.30	1.95
1922–23	2.48	.31	2.17
1923–24	3.20	.71	2.49
1924–25	2.05	.67	1.38
1925–26	3.26	.83	2.43
1926–27	3.13	1.21	1.91
Average 1922–23 to 1926–27	3.02	.77	2.25

A superficial inspection of the postwar figures in Table 21 reveals a closer annual relationship between fluctuations in production (*P*) and export (*E*) than between those of (*P*) and (*D*). In discussing the case of wheat, the data of the very unusual crop-year 1924–25 was eliminated. In the case of rye, disappearance dropped to 1.38 bushels per capita during 1924–25. For this reason and for purposes of comparison with the wheat situation, the postwar trend in disappearance and export is considered to be best described by the relationships of the years 1922–23, 1923–24, 1925–26, and 1926–27 as indicated in Table 22.

TABLE 22.—*Rye: Per capita net production and per capita net export in Hungary, present boundary, 1922–23, 1923–24, 1925–26, and 1926–27*

Crop year	Per capita net production P	Per capita net export E	EP	P^2	E^2
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Bushels*
1922–23	2.48	0.31	0.7688	6.1504	0.0961
1923–24	3.20	.71	2.2720	10.2400	.5041
1925–26	3.26	.83	2.7058	10.6276	.6889
1926–27	3.12	1.21	3.7752	9.7344	1.4641
Total (Σ)	12.06	3.06	9.5218	36.7524	2.7532

If the totals of the columns in Table 22 are substituted in the normal equations, given on page 37, it is found that:

$$E' = 0.7556\,P - 1.51$$

If this equation is used in estimating the per capita net export of rye under average conditions, the values for E' coincident with the per capita net production of each of the 4-crop years as given in column 4 of Table 23 are obtained. These values for E' all fall in the straight line of average relationship plotted in Figure 5.

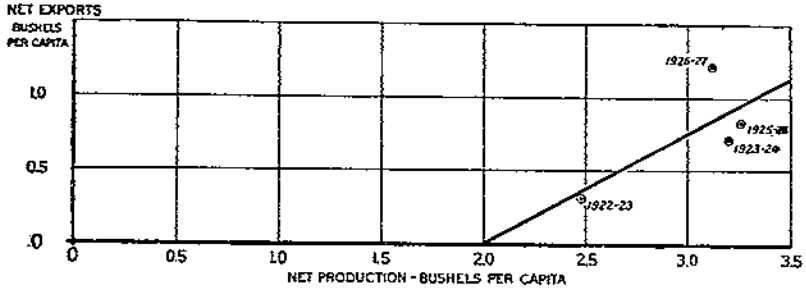

FIGURE 5.—RELATION BETWEEN PER CAPITA NET PRODUCTION AND PER CAPITA NET EXPORTS OF RYE IN RESIDUAL HUNGARY, 1922-23, 1923-24, 1925-26, AND 1926-27

The relationship of per capita net exports of rye from residual Hungary during the years 1922–23, 1923–24, 1925–26, and 1926–27 exhibited a trend relationship to production; but this relationship was not nearly as close as in the case of wheat. (Fig. 4.)

TABLE 23.—*Rye: Estimated per capita net export under average conditions contrasted with observed per capita net export in Hungary, present boundary, 1922–23, 1923–24, 1925–26, and 1926–27*

Crop year	Per capita net production P	Production multiplied by ratio of variation bP	Estimated per capita net export under average conditions $bP+a^1=E'$	Observed per capita net export E	Difference between estimated and observed $E-E'$	$(E-E')^2$
	Bushels	*Bushels*	*Bushel*	*Bushels*	*Bushel*	*Bushel*
1922–23	2.48	1.87	0.36	0.31	−0.05	0.0025
1923–24	3.20	2.42	.91	.71	−.20	.0400
1925–26	3.26	2.46	.95	.83	−.12	.0144
1926–27	3.12	2.36	.85	1.21	+.36	.1296
Total (Σ)						.1865

[1] a is an algebraically negative quantity in this case.

The domestic disappearance of rye in Hungary has fluctuated more widely than has that of wheat. Consequently the relationship of production to export has not been as close as in the case of the major bread cereal. An inspection of the scatter diagram, Figure 5, shows a much greater dispersion of the annual observed rye exports about the line of average relationship than was the case with observed wheat exports. (Fig. 4.)

It is therefore to be expected that the value of the standard error of estimate, in the case of rye exports, will be greater than in the case of wheat exports.

Substituting in the equation $S = \pm\sqrt{\frac{\Sigma(E-E')^2}{n}}$ gives

$$S = \pm\sqrt{\frac{0.1865}{4}}$$

$$S = \pm 0.216$$

Another way of putting this is to say that there is not as close a correlation between production and exports of rye as between production and exports of wheat. The measure of correlation (r) between two variables as P and E can be expressed by the equation

$$r = \pm\sqrt{1 - \frac{S^2}{\frac{\Sigma E^2}{n} - \left(\frac{\Sigma E}{n}\right)^2}}$$

Substituting in the case of rye gives:

$$r = \pm\sqrt{1 - \frac{0.046625}{0.6883 - 0.585225}}$$

$$r = \pm 0.74$$

Substituting the value of S in the case of wheat (p. 41) and the values of $\frac{\Sigma E^2}{n}$ and $\left(\frac{\Sigma E}{n}\right)^2$, derived from Table 16 gives

$$r = \pm\sqrt{1 - \frac{0.0009}{4.08865 - 3.51563}}$$

$$r = \pm 0.999$$

The lower correlation between rye production and rye export indicates that under average conditions each observed annual export (E) will not tend to approximate the corresponding estimated export (E') within as close a range as in the case of wheat.

The net production of rye in Hungary in 1927 was only 17,376,000 bushels, or 2.04 bushels per capita, as compared with a per capita net production of 3.12 bushels the previous season. The estimated per capita net export for the crop year 1927–28 that might have been expected under the average conditions of 1922–23, 1923–24, 1925–26,

and 1926–27, is found by substituting in the normal equation as given on page 47, which gives $E' = 2.04 \times 0.7556 - 1.51$

$$E' = 0.03$$

The value of $S = \pm 0.216$ (the standard error of estimate) is 7.2 times as great as this estimated value $E' = 0.03$ (the probable export under average conditions). Even under average conditions, little dependence could be placed on this estimate of probable export. The situation that developed during 1927–28 was far from average.

The estimated per capita export of 0.03 bushel is equivalent to an estimated total net export of 256,000 bushels.[25]

Multiplying the error of estimate (± 0.216) by the 1927–28 estimated population indicates a probability of 68 in 100 that the actual export would be 1,840,000 bushels greater or less than the estimated; that is, international trade might range from an export of 2,096,000 bushels to an import of 1,584,000 bushels. The chances were 95 in 100 that international trade might range from an import of 3,425,000 bushels to an export of 3,937,000 bushels. This is a range of 7,300,000 bushels, which is greater than the net export of any crop year, except 1926–27.

Preliminary reports for the 12 months ended July 31, 1928, indicate that net exports of rye from Hungary were approximately 4,471,000 bushels. This export of 4,471,000 bushels of rye during a season when there was a rye shortage in many parts of the country was possible because of the peculiar location of the rye surplus-producing districts.

The chief rye surplus-producing regions in Hungary are the Comitat of Pest, comprising the light soils along the east bank of the Danube, and the northwestern comitates along the south bank of the Danube. (Fig. 6.) In years of high production it is very easy to concentrate and ship rye up the Danube to Austria and Czechoslovakia, and the grain-handling organizations of these regions are organized primarily to export grain rather than to cater to the domestic trade. It is also easier in years of generally low production to concentrate the rye of these townships along the Danube for export than to distribute it to the districts of rye shortage in eastern and southeastern Hungary. At such times, these deficit districts generally make up their rye shortage by consuming a greater than normal amount of wheat, particularly if wheat is relatively cheap. It is not customary in Hungary as in Germany to substitute potatoes for rye in making bread.

In April and May, 1927, disastrous frosts reduced the productivity of the rye crop, which was 28.8 per cent below that of 1926. The price situation in Hungary can not be analyzed completely on account of lack of data. However, during the second half of the calendar year 1927 prices rose from 27.52 pengös per quintal (122 cents per bushel) in August to 29.15 pengös (129 cents per bushel) in December. This rise was chiefly in response to home demand since there were relatively favorable harvests in Austria and Czechoslovakia and the foreign demand for Hungarian rye was apathetic. During the

[25] The estimated population for 1927–28 was 8,520,000.

early months of 1928 the price of rye in Hungary rapidly approached that of wheat, the price difference amounting to 5 to 6 per cent in

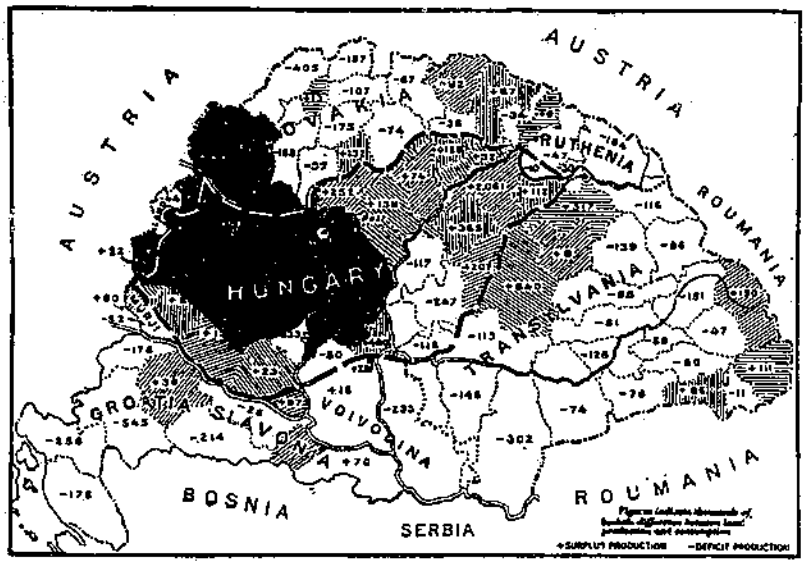

FIGURE 6.—AVERAGE PRODUCTION OF RYE, 1911-1915, BALANCED AGAINST DISAPPEARANCE

The numbers represent thousands of bushels. The solid black areas roughly outline the districts in which most of the export rye was produced. The shaded areas outline those districts whose combined surplus was sufficient to cover the local domestic deficits within the boundary of the old Kingdom of Hungary. The deficit districts are roughly outlined by the unshaded areas. The surplus producing area of residual Hungary is situated in the northwestern part of the country.

April. With such a small price difference, it is natural that consumers should prefer wheat flour for bread and that the domestic consumption of rye should be less than normal.

TABLE 24.—*Rye: Average price in Budapest, by months, January, 1922–December, 1925, January, 1927–July, 1928*

Month	1922		1922-23		1923-24		1924-25		1925-26		1926-27		1927-28	
	Crowns per quintal	Cents per bushel	Crowns per quintal	Cents per bushel	Crowns per quintal	Cents per bushel	Crowns per quintal	Cents per bushel	Crowns per quintal	Cents per bushel	Pengös per quintal	Cents per bushel	Pengös per quintal	Cents per bushel
August			5,077	77	50,610	129	344,333	114	282,283	100	(1)		27.52	122
September			6,540	66	62,120	158	358,700	118	266,510	95	(1)		28.42	126
October			7,370	75	63,176	160	428,462	141	247,538	88	(1)		28.43	126
November			6,843	70	69,938	178	413,229	136	227,250	81	(1)		28.23	125
December			7,211	73	81,457	207	419,479	139	255,208	91	(1)		29.15	129
January	1,520	58	8,136	83	109,375	108	478,700	164	(1)		[2] 26.50	118	29.06	129
February	1,715	65	8,165	83	184,427	155	491,695	175	(1)		(1)		29.35	130
March	1,971	65	10,279	78	266,875	102	445,650	158	(1)		(1)		31.26	139
April	2,370	78	14,831	75	277,554	99	457,717	163	(1)		[2] 29.00	129	32.11	142
May	2,925	97	17,057	87	312,115	103	417,200	148	(1)		(1)		30.85	137
June	3,256	91	24,100	61	207,272	81	411,957	147	(1)		29.26	130	30.20	134
July	4,803	98	35,779	91	316,538	96	358,981	128	(1)		26.42	117	24.73	110

January, 1922, to July, 1928, from Inst. Internatl. Statis. Bul. Mens. Off. Permanent.
See Table 54 for average values of the crown and pengö.

[1] Not available.

[2] Prices at end of month (*3, p. 72*).

Monthly prices in Hungary are not available from January, 1926, through December, 1926, but the yearly average quotation for rye in 1926 in Budapest was 20.09 pengös per 100 kilograms ($0.90 per bushel), as compared with 28.01 schillings per 100 kilograms ($1 per bushel) in Vienna and 158.6 crowns ($1.19 per bushel) in Prague. In 1927 the annual average was 27.85 pengös per 100 kilograms ($1.24 per bushel) in Budapest, as compared with 37.86 schillings per 100 kilograms ($1.35 per bushel) in Vienna, whereas the Prague quotation reached 223.66 crowns per 100 kilograms ($1.68 per bushel).

By March, 1928, Prague was offering 236.43 crowns per 100 kilograms ($1.78 per bushel) and Vienna 42 schillings ($1.50 per bushel). With the Budapest price at 31.26 pengös per 100 kilograms ($1.39 per bushel), rye moved up the Danube, although the shortage at home was acute. This relative price relationship among these three countries as regards rye fluctuated somewhat during April, May, and June, but in general there was a strong demand in Czechoslovakia and Austria for Hungarian rye. At the same time, the demand for wheat by these countries was relatively less.

The peculiar geographic position of the rye-surplus districts and the organization of the export trade subjects the rye of Hungary to unusual and wide fluctuations as regards the relationships of production to export and domestic disappearance. Price relationships favoring export will always draw rye out of the country regardless of the usual domestic demand.

TABLE 25.—*Rye:*[1] *Acreage and production in Hungary, 1877–1928*

Year	Hungary (proper)			Croatia and Slavonia			Total Hungary		
	Acreage	Production	Yield per acre	Acreage	Production	Yield per acre	Acreage	Production	Yield per acre
	1,000 acres	*1,000 bushels*	*Bushels*	*1,000 acres*	*1,000 bushels*	*Bushels*	*1,000 acres*	*1,000 bushels*	*Bushels*
Pre-war years:									
1877	3,101	[2] 38,051	12.27	------	------	------	3,101	38,051	12.27
1878	3,207	[2] 52,049	15.93	------	------	------	3,207	52,049	15.93
1879	2,968	[2] 24,214	8.16	------	------	------	2,968	24,214	8.16
1880	2,693	[2] 34,592	12.85	------	------	------	2,693	34,592	12.85
1881	2,698	[2] 40,324	14.95	------	------	------	2,698	40,324	14.95
1882	2,698	[2] 50,653	18.77	------	------	------	2,698	50,653	18.77
1883	2,723	[2] 40,219	14.77	------	------	------	2,723	40,219	14.77
1884	2,738	[2] 43,102	15.74	------	------	------	2,738	43,102	15.74
1885	2,805	41,344	14.74	289	3,079	10.65	3,094	44,423	14.36
1886	2,790	37,100	13.30	287	3,303	11.51	3,077	40,403	13.13
1887	2,782	50,851	18.28	279	2,972	10.65	3,061	53,823	17.58
1888	2,740	41,820	15.26	277	2,992	10.80	3,017	44,812	14.85
1889	2,686	36,466	13.58	277	2,571	9.28	2,963	39,037	13.17
1890	2,691	49,749	18.49	277	2,988	10.79	2,968	52,737	17.77
1891	2,562	37,025	14.45	259	2,874	11.10	2,821	39,899	14.14
1892	2,740	46,092	16.82	257	2,433	9.47	2,997	48,525	16.19
1893	3,049	55,489	18.20	259	2,976	11.49	3,308	58,465	17.67
1894	2,758	54,934	19.92	264	3,338	12.64	3,022	58,272	19.28
1895	2,580	44,887	17.40	242	1,882	7.78	2,822	46,769	16.57
1896	2,585	48,131	18.62	242	2,945	12.17	2,827	51,076	18.07
1897	2,473	33,955	13.73	235	2,264	9.63	2,708	36,219	13.37
1898	2,511	42,797	17.04	225	3,496	15.54	2,736	46,293	16.92
1899	2,599	47,202	18.16	217	2,669	12.30	2,816	49,871	17.71
1900	2,548	40,206	15.78	205	2,287	11.16	2,753	42,493	15.44
1901	2,590	40,884	15.79	205	2,775	13.54	2,795	43,659	15.62
1902	2,597	49,458	19.04	222	3,051	13.74	2,819	52,509	18.63
1903	2,607	47,356	18.20	215	3,386	15.75	2,817	50,742	18.01
1904	2,565	43,879	17.11	213	2,039	9.57	2,778	45,918	16.53
1905	2,602	50,544	19.43	203	2,535	12.49	2,805	53,079	18.92
1906	2,629	51,062	19.76	188	1,917	10.20	2,817	53,879	19.13
1907	2,401	39,445	16.03	171	2,136	12.49	2,632	41,581	15.80
1908	2,575	45,185	17.55	175	2,520	14.40	2,750	47,705	17.35

[1] Includes spelt through 1906; converted to bushels, using rye equivalent.
[2] Winchester bushels converted from hectoliters.

TABLE 25.—*Rye: Acreage and production in Hungary, 1877–1928*—Continued

Year	Hungary (proper)			Croatia and Slavonia			Total Hungary		
	Acreage	Production	Yield per acre	Acreage	Production	Yield per acre	Acreage	Production	Yield per acre
	1,000 acres	*1,000 bushels*	*Bushels*	*1,000 acres*	*1,000 bushels*	*Bushels*	*1,000 acres*	*1,000 bushels*	*Bushels*
Pre-war years:									
1909	2,496	44,856	18.04	172	2,390	13.90	2,668	47,248	17.78
1910	2,534	49,696	19.86	176	2,106	11.97	2,810	51,792	18.43
1911	2,557	47,785	18.69	176	2,543	14.45	2,733	50,328	18.41
1912	2,654	51,442	19.38	168	1,752	10.63	2,818	53,194	18.88
1913	2,558	50,168	19.61	166	2,531	15.25	2,724	52,697	19.35
War years:									
1914	2,639	42,411	16.07	220	3,027	13.76	2,859	45,438	15.89
1915	2,570	45,682	17.78	205	2,094	10.21	2,775	47,776	17.22
1916	2,538	37,408	14.75	170	1,374	8.08	2,706	38,782	14.33
1917	2,624	39,936	15.82	(1)	(1)	.....	2,524	39,936	15.82
1918	2,453	32,439	13.22	(1)	(1)	.....	2,453	32,439	13.22
Post-war years:									
1919	(2)	(2)	.....	(1)	(1)	.....	(2)	(2)	(2)
1920	1,475	20,248	13.73	(1)	(1)	.....	1,475	20,248	13.73
1921	1,341	23,177	17.28	(1)	(1)	.....	1,341	23,177	17.28
1922	1,663	25,147	15.12	(1)	(1)	.....	1,663	25,147	15.12
1923	1,620	31,274	19.30	(1)	(1)	.....	1,620	31,274	19.30
1924	1,638	22,103	13.49	(1)	(1)	.....	1,638	22,103	13.49
1925	1,699	32,526	19.14	(1)	(1)	.....	1,699	32,526	19.14
1926	1,729	31,416	18.17	(1)	(1)	.....	1,729	31,416	18.17
1927	1,657	22,365	13.50	(1)	(1)	.....	1,657	22,365	13.50
1928	1,641	32,528	19.82	(1)	(1)	.....	1,641	32,528	19.82

1877–1896 from Das Getreide im Weltverkehr, Austria 1900: 50–53.
1897–1904 from Das Getreide im Weltverkehr, Austria 1905: 20–21.
1905–1908 from Das Getreide im Weltverkehr, Austria 1909: 16–17.
1907–1908 from Magyar Statisztikai Évkön. 1910: 100–101.
1909–1912 from Magyar Statisztikai Évkön. 1913: 87–88.
1913–1915 from Magyar Statisztikai Évkön. 1915: 86–87.
1916–1918 from Ann. Statis. Hongrois 1916, 1917, 1918: 40–44, 47–52.
1920 from Ann. Statis. Hongrois 1919–1923: 50, 50.
1921–1928 from official records of U. S. Department Agriculture, Bureau of Agricultural Economics.

[1] Ceded to Yugoslavia. [2] Not available.

BREAD CEREALS

The exports of wheat and rye flour were not stated separately in Hungarian statistics until the season 1906–07 because the use of these two flours was closely related and in a sense interchangeable in the deficit districts of the former Austro-Hungarian Monarchy, to which wheat and rye products were shipped from the old Kingdom of Hungary. In the old Kingdom of Hungary there does not appear to have been a year-to-year inverse relationship between the disappearance of wheat and rye. In some countries, a decrease in wheat disappearance is often associated with an increase in that of rye, but, before the World War, only once (in 1912–13) was a decrease in wheat disappearance in the old Kingdom of Hungary associated with an increased disappearance of rye.

During the eight crop years 1920–21 to 1927–28, there was only one season during which an inverse relationship between the use of wheat and rye was indicated. In 1927–28, a per capita decrease of 0.4 bushel of rye was associated with an increased per capita disappearance of 0.17 bushel of wheat. In other years, the wheat and rye disappearance fluctuated together.

Before the World War it was customary for the officials of the Austro-Hungarian Monarchy to consider the two bread cereals together on a flour basis. An analysis of the postwar bread-cereal situation on a flour basis is therefore not out of place.

THE RELATION OF PRODUCTION AND DISAPPEARANCE TO THE EXPORT OF BREAD CEREAL

Before the World War, the disappearance of bread cereals in Hungary averaged 10,663,000 bushels of rye [26] and 40,462,000 bushels of wheat. The pre-war milling coefficients in Austria-Hungary were 72 per cent for rye and 76.2 per cent for wheat; this indicates a pre-war disappearance of 429,932,000 pounds of rye flour and 1,849,923,000 pounds of wheat flour, or a total of 2,279,855,000 pounds of flour. The average per capita disappearance of wheat and rye flour during 1909–10 to 1913–14 averaged 300 pounds.

During the four seasons 1922–23, 1923–24, 1925–26, and 1926–27, the disappearance of bread cereals in Hungary averaged 18,637,000 bushels of rye [26] and 41,330,000 bushels of wheat. If the pre-war milling coefficients are employed, these quantities are equivalent to 751,444,000 pounds of rye flour and 1,889,608,000 pounds of wheat flour, or a total of 2,641,052,000 pounds of flour. The average per capita disappearance of wheat and rye flour during these four years was 318 pounds as compared with 300 pounds before the World War.

During the interval between the two periods, population had increased from 7,606,917, before the World War to an average of 8,293,711, during the postwar period. A part of the increased total disappearance of 361,197,000 pounds of flour is associated with increased population. A higher standard of living has also been established as evidenced by an increase of 18 pounds in per capita disappearance.

Before the World War per capita net production of bread cereals in residual Hungary was equivalent to 507 pounds of wheat and rye flour. Production had decreased to an average equivalent to 435 pounds of flour per capita during the four years 1922–23, 1923–24, 1925–26, and 1926–27. Disappearance had increased from 300 pounds to 318 and, consequently, average exports were cut nearly in half. A comparison of the pre-war average with that of the four post-war years shows a drop in net exports of wheat and rye from the equivalent of 207 pounds of flour per capita to 117 pounds. (Table 26.)

TABLE 26.—*Wheat and rye:* [a] *Per capita net production, export and disappearance, average, old Kingdom of Hungary, 1909–10 to 1913–14, and annual Hungary present boundary, 1922–23, 1923–24, 1925–26, and 1926–27*

Crop year	Per capita net		
	Production *P*	Exports *E*	Disappearance *D*
	Pounds	*Pounds*	*Pounds*
Old Kingdom of Hungary: Average 1909–10 to 1913–14	507	207	300
Present boundary:			
1922–23	355	41	314
1923–24	450	120	330
1925–26	465	139	326
1926–27	470	166	304
Average	435	117	318

[a] Wheat and wheat flour and rye and rye flour expressed in terms of flour.

[26] Includes maslin, which is a mixture of wheat and rye sown together. This mixture is harvested and milled in local gristmills for consumption by the farmer's own family.

The per capita net disappearance of wheat, rye, and maslin flour has remained remarkably uniform during these four years, ranging from 12 pounds above to 14 pounds below the mean of 318 pounds per capita. On the other hand, as production has ranged up or down exports have tended on the average to range in like direction. (Table 27.)

TABLE 27.—*Wheat and rye:* [1] *Per capita net production and per capita net export in Hungary, present boundary, 1922–23, 1923–24, 1925–26, and 1926–27*

Crop year	Per capita net production P	Per capita net exports E	EP	P^2	E^2
	Pounds	*Pounds*	*Pounds*	*Pounds*	*Pounds*
1922–23	355	41	14,555	126,025	1,681
1923–24	450	120	54,000	202,500	14,400
1925–26	485	139	64,635	216,225	19,321
1926–27	470	166	78,020	220,900	27,556
Total (Σ)	1,760	466	211,210	765,650	62,958

[1] Wheat and wheat flour and rye and rye flour expressed in terms of flour.

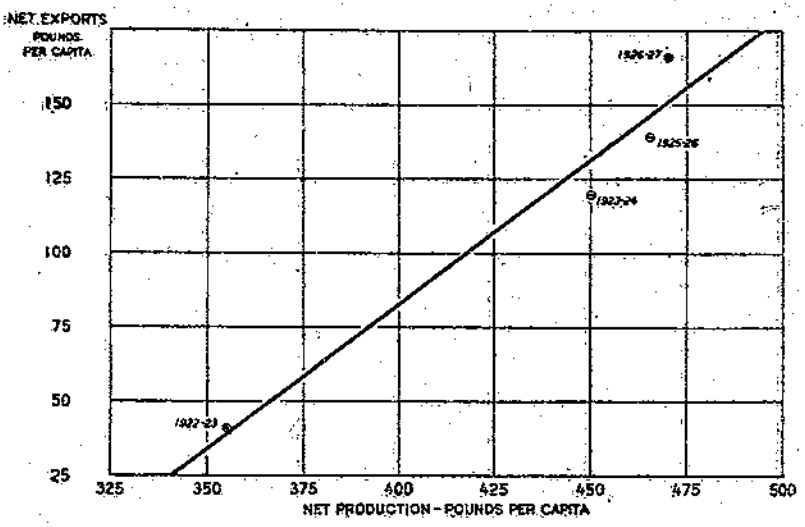

FIGURE 7.—RELATION BETWEEN PER CAPITA NET PRODUCTION OF WHEAT AND RYE, EXPRESSED IN TERMS OF FLOUR, AND PER CAPITA NET EXPORTS OF WHEAT AND RYE, EXPRESSED IN TERMS OF FLOUR IN RESIDUAL HUNGARY, 1922-23, 1923-24, 1925-26, AND 1926-27

Since wheat and rye are interchangeable in making bread in residual Hungary, a description of these bread cereals would not be complete without considering the relationships between the per capita net production of wheat plus rye and the combined per capita net exports of these two cereals.

If the totals in the columns of Table 27 are substituted in the normal equations given on page 37, it is seen that $E' = 0.9715\,P - 306$. The values for E' coincident with the per capita net production of each of the crop years are given in column 4 of Table 28. These values for E' all fall in the straight line of average relationship plotted in Figure 7.

TABLE 28.—*Wheat and rye:* [1] *Estimated equivalent of the per capita net export of bread cereals under average conditions contrasted with that of observed per capita net export in Hungary, present boundary, 1922–23, 1923–24, 1925–26, and 1926–27*

Crop year	Per capita net production P	Production multiplied by ratio of variation bP	Estimated per capita net export under average conditions $bP+a^2=E'$	Observed per capita net export E	Difference between estimated and observed $E-E'$	$(E-E')^2$
	Pounds	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*
1922–23	355	345	39	41	+2	4
1923–24	450	437	131	120	−11	121
1925–26	465	452	146	139	−7	49
1926–27	470	457	151	166	+15	225
Total (2)						399

[1] Wheat and wheat flour and rye and rye flour expressed in terms of flour.
[2] a is an algebraically negative quantity in this case.

The dispersion of the observed values of (E) above and below the line of average relationship is relatively less (fig. 7) than in the case of rye. (Fig. 6.) The value of the standard error of estimate is therefore proportionately smaller.

Substituting in the equation $S=\pm\sqrt{\frac{\Sigma(E-E')^2}{n}}$ gives $S=\pm 10$.

The net production of wheat in 1927 was estimated at 65,195,000 bushels, equivalent to 2,980,715,000 pounds of flour. Net production of rye (including maslin) was 17,376,000 bushels, equivalent to 700,600,000 pounds of flour. The total flour equivalent of the bread cereal production in 1927 was thus 3,681,315,000 pounds or 432 pounds per capita.

The per capita net export under average conditions that might be expected to follow a production of 432 pounds is estimated by substituting in the equation

$$E'=0.9715P-306$$

$$E'=114$$

There was the probability that in 68 out of 100 chances the flour equivalent of the exports of wheat and rye would approximate 114 pounds within a range of ± 10 pounds per capita. In 95 cases out of 100, the range should not be greater than ±20 pounds per capita.

Preliminary reports for the year August 1, 1927, to July 31, 1928, placed the net exports of wheat from residual Hungary at 12,004,246 bushels of grain and 2,108,172 barrels of flour. Employing 76.2 per cent as the factor to convert grain to flour gives a total wheat export equivalent to 962,036,000 pounds of flour. The net rye export during 1927–28 has been placed at 3,869,070 bushels of grain and 100,281 barrels of flour. If 72 per cent is employed as the factor to convert grain to flour, the total rye export was equivalent to 175,656,000 pounds of flour. The total bread cereal export was, thus, equivalent to 1,137,692,000 pounds of flour or 134 pounds per capita or 20 pounds higher than the estimated export of 114 pounds per capita.

The mathematical description of the relations of production to disappearance and exportation outlined above is not a method for accurately forecasting the expectancy in exportation to be associated with the production of any given year. It does, however, accurately describe past performance and furnishes a descriptive basis for forecasting probably future performance under the average conditions of the group of variables employed to obtain that average.

At the beginning of the season of 1927–28, wheat moved with difficulty because of relatively unprofitable quotations in Vienna and Prague. Although there was a greater crop in Hungary than during the previous season, exports were light during the first few months following the harvest, and it is probable that grain and flour were accumulated in warehouses. This is exactly the reverse of the rye situation. The shortage of the rye crop was sufficient to warrant an import, if average disappearance were to be maintained, and yet the price pull from Vienna and Prague was great enough to make it profitable to export. Merchants bought and exported rye wherever possible. As the surplus rye in the northwestern districts was shipped out of the country, prices rose to nearly a parity with wheat and rye movement slackened. The unavailability of rye probably tended to release stored wheat and flour, but toward the close of the crop year the exports of rye, as compared with those of the first part of 1927–28, tended to be relatively greater than the exports of wheat.

During the last four months of the crop year Hungary exported the equivalent of 4,561,000 bushels of wheat or 21.2 per cent as much as the total gross exports of 1927–28. At the same time 1,264,000 bushels of rye, or 32.7 per cent of the year's total, was shipped up the Danube. The proximity of surplus-producing regions to demand centers and the relative price pull of the domestic and foreign markets are highly important factors in determining the manner in which the production of an exporting country is utilized. Abnormal conditions in price relationships create widely fluctuating results. In years of abnormal production, under stress of price fluctuations, the substitution of one cereal for another may create a wide departure from the average relationships that might have been expected under normal conditions.

BARLEY

Before the World War residual Hungary seeded 1,322,000 acres of barley annually. By 1927 barley acreage had decreased more than 300,000 acres. Yields per acre had also fallen off to such an extent that the 1923–1927 average was 2.1 bushels per acre below that of 1909–1913. Net production, during the 5-year period ended 1927, was thus reduced to an average of 20,367,200 bushels, as compared with 28,535,000 bushels before the World War. (Table 29.)

TABLE 29.—*Barley: Statistical balances of present Hungary, average 1909–1913, and annual 1921–22 to 1928–29*

Crop year	Acreage	Seed [1]	Production		Disappearance		Exportable surplus
			Gross	Net [2]	Total	Per capita [3]	
	1,000 acres	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Bushels*	*1,000 bushels*
Pre-war average: [4]							
1909–1913	1,322	3,834	32,369	28,535	[5] 19,926	2.62	8,609
Post-war years: [6]							
1921–22	1,184	3,434	21,408	18,088	17,908	2.22	[7] 180
1922–23	1,145	3,320	22,169	18,872	18,871	2.32	[7] 1
1923–24	1,137	3,297	27,271	24,348	24,013	2.92	[7] 335
1924–25	1,008	2,923	14,712	11,757	11,525	1.39	[7] 232
1925–26	1,019	2,955	25,430	22,335	20,115	2.40	[7] 2,270
1926–27	1,050	3,045	25,509	22,603	20,261	2.40	[7] 2,342
1927–28	1,002	2,906	23,684	20,743	18,559	2.18	[7] 2,184
1928–29	1,014	2,941	27,871	24,930			

[1] 2.9 bushels per acre (*10, p. 28*).
[2] Production for stated year, minus seed for the following year except for average 1909–1913 and annual 1928–29.
[3] See Table 8 for populations.
[4] Acreage and production calculated from Magyar Statisztikai Évkön. 1909–1913.
[5] From *10, p. 28.*—Barley fed to swine plus estimate for that used industrially.
[6] Acreage and production 1921–1928 from official records of U. S. Department of Agriculture, Bureau of Agricultural Economics.
[7] Net exports for years beginning August 1, from Internatl. Yearbook Agr. Statis. 1924–25, and 1927–28.

As indicated in Table 1, the large estates seeded 13.2 per cent of their cereal acreage to barley in 1926, whereas the small farmers seeded about 10.3 per cent. The transfer of 1,246,000 acres of plowlands from the management of the estates into the hands of small peasant farmers accounts for the general reduction in barley acreage throughout Hungary. It is probable that the new level of barley acreage fluctuating about the 1923–1927 average of 1,043,000 acres indicates the future level of Hungary's barley production.

The malt industry of Hungary depends entirely upon the export possibilities for its prosperity. The domestic breweries produce more malt than they need for their own consumption; the factories exclusively engaged in producing malt are dependent upon foreign countries for their market. The sale of malt abroad, however, is accompanied by many difficulties, among which are the customs barriers of surrounding countries and the unfavorable position of Hungarian malt in respect to freight tariffs, as compared with its great competitor, the malt of Czechoslovakia. In spite of these difficulties, the export of malt increased from 7,083 short tons in 1926 to 7,841 short tons in 1927. The greatest quantity, 2,358 short tons, was exported to Austria. Switzerland took 1,923 short tons; Yugoslavia, 1,129; Holland, 1,100; Italy, 892; Germany, 372; and Portugal, 67 short tons. The import amounted to 4 short tons. (Commerce and Industry of Hungary in the year 1927, 1928, p. 107.)

If the poor crop season of 1924–25 is excluded, the per capita net disappearance of barley since the World War has averaged 2.41 bushels, or nearly the same as during 1909–1913, 2.62 bushels. As a result, the surplus available for export was reduced to negligible proportions until 1925–26. Before the World War, the territories within the present boundaries of Hungary produced a surplus of approximately 8,609,000 bushels, whereas actual average exports during 1921–1924 amounted to only 187,000 bushels. However,

beginning with the season 1925–26, exports rose to more than 2,200,000 bushels.

TABLE 30.—*Barley: Acreage and production in Hungary, 1877–1928*

Year	Hungary (proper)			Croatia and Slavonia			Total Hungary		
	Acreage	Production	Yield per acre	Acreage	Production	Yield per acre	Acreage	Production	Yield per acre
	1,000 acres	*1,000 bushels*	*Bushels*	*1,000 acres*	*1,000 bushels*	*Bushels*	*1,000 acres*	*1,000 bushels*	*Bushels*
Pre-war years:									
1877	2,301	[1] 34,458	14.98	.....	.....	.....	2,301	34,458	14.98
1878	2,471	[1] 47,415	19.19	.....	.....	.....	2,471	47,415	19.19
1879	2,420	[1] 26,200	10.79	.....	.....	.....	2,429	26,200	10.79
1880	2,417	[1] 50,917	21.07	.....	.....	.....	2,417	50,917	21.07
1881	2,251	[1] 39,912	17.73	.....	.....	.....	2,251	39,912	17.73
1882	2,399	[1] 57,566	24.00	.....	.....	.....	2,399	57,566	24.00
1883	2,402	[1] 39,209	16.36	.....	.....	.....	2,402	39,209	16.36
1884	2,459	[1] 46,816	19.04	.....	.....	.....	2,459	46,816	19.04
1885	2,585	56,690	21.93	173	2,544	14.71	2,758	60,234	21.48
1886	2,580	39,517	15.32	170	2,453	14.43	2,750	41,970	15.26
1887	2,481	58,151	23.44	168	2,191	13.04	2,649	60,342	22.78
1888	2,424	47,054	19.41	166	2,131	12.84	2,590	49,185	18.99
1889	2,458	36,008	14.47	158	1,782	11.28	2,646	37,790	14.28
1890	2,488	55,198	22.19	166	2,370	14.29	2,654	57,568	21.69
1891	2,577	57,150	22.18	161	2,044	12.70	2,738	59,203	21.62
1892	2,577	54,146	21.01	168	2,182	12.99	2,745	56,328	20.52
1893	2,585	64,758	25.05	166	2,420	14.58	2,751	67,176	24.42
1894	2,609	60,227	23.08	170	2,838	16.69	2,779	63,065	22.69
1895	2,496	54,495	21.83	163	2,356	14.45	2,659	56,851	21.38
1896	2,496	61,012	24.44	170	2,990	17.59	2,666	64,002	24.01
1897	2,358	42,025	17.97	156	2,081	13.34	2,494	44,106	17.68
1898	2,409	57,333	23.80	175	3,541	20.23	2,584	60,874	23.56
1899	2,511	61,586	24.53	170	2,733	16.08	2,681	64,319	23.99
1900	2,486	53,875	21.67	183	2,903	15.86	2,669	56,778	21.27
1901	2,503	50,072	20.00	178	3,050	17.13	2,681	53,122	19.81
1902	2,523	62,349	24.71	173	3,261	18.85	2,696	65,610	24.34
1903	2,567	64,576	25.16	178	3,840	21.57	2,745	68,416	24.92
1904	2,520	49,916	19.81	173	2,283	13.20	2,693	52,199	19.38
1905	2,550	62,454	24.49	170	2,868	16.86	2,720	65,320	24.01
1906	2,602	69,748	26.81	165	2,756	16.69	2,768	72,504	26.19
1907	2,725	63,077	23.15	161	2,064	12.82	2,886	65,141	22.57
1908	2,647	56,323	21.28	160	2,552	15.95	2,807	58,875	20.97
1909	2,858	71,870	25.15	157	2,347	14.93	3,015	74,217	24.62
1910	2,716	53,627	19.74	158	2,104	13.32	2,874	55,731	19.39
1911	2,736	73,507	26.90	158	2,641	16.72	2,894	76,238	26.34
1912	2,603	70,143	26.95	156	1,975	12.66	2,759	72,118	26.14
1913	2,837	79,825	27.65	158	3,123	19.77	3,045	82,948	27.24
War years:									
1914	2,705	65,265	24.13	154	2,342	15.21	2,859	67,607	23.65
1915	2,786	58,302	20.93	151	1,690	11.19	2,937	59,992	20.43
1916	2,648	51,891	19.60	148	1,605	10.84	2,796	53,496	19.13
1917	2,506	36,947	14.74	[2]	[2]	.....	2,506	36,947	14.74
1918	2,321	40,365	17.39	[2]	[2]	.....	2,321	40,365	17.39
Post-war years:									
1919	[2]	[2]	[2]	[2]	[2]	.....	[2]	[2]	[2]
1920	1,266	21,672	17.12	[2]	[2]	.....	1,266	21,672	17.12
1921	1,184	21,408	18.08	[2]	[2]	.....	1,184	21,508	18.08
1922	1,145	22,169	19.36	[2]	[2]	.....	1,145	22,169	19.36
1923	1,137	27,271	23.99	[2]	[2]	.....	1,137	27,271	23.99
1924	1,008	14,712	14.60	[2]	[2]	.....	1,008	14,712	14.60
1925	1,019	25,430	24.96	[2]	[2]	.....	1,019	25,430	24.96
1926	1,050	25,509	24.29	[2]	[2]	.....	1,050	25,509	24.29
1927	1,002	23,684	23.64	[2]	[2]	.....	1,002	23,684	23.64
1928	1,014	27,871	27.49	[2]	[2]	.....	1,014	27,871	27.49

1877–1896 from Das Getreide im Weltverkehr, Austria 1900: 50–53.
1897–1904 from Das Getreide im Weltverkehr, Austria 1905: 20–21.
1905–1906 from Das Getreide im Weltverkehr, Austria 1909: 16–17.
1907–1908 from Magyar Statisztikai Évkön. 1910: 100–101.
1909–1912 from Magyar Statisztikai Évkön. 1913: 87–88.
1913–1915 from Magyar Statisztikai Évkön. 1913: 86–87.
1916–1918 from Ann. Statis. Hongrois 1916, 1917, 1918: 40–44, 47–52.
1920 from Ann. Statis. Hongrois 1919–1922: 56, 60.
1921–1928 from official records of U. S. Department of Agriculture, Bureau of Agricultural Economics.

[1] Winchester bushels converted from hectoliters.
[2] Ceded to Yugoslavia.
[3] Not available.

The barley crop of 1927 was very good as regards quality although far below the pre-war average production and smaller than the previous year. The breweries, both domestic and foreign, took an interest in Hungarian barley soon after it began to come on the market. Thanks to the superior quality of the 1927 crop, new markets were obtained in Great Britain (137,000 bushels), and in Poland (10,000 bushels brewer's barley, and 4,000 bushels fodder barley). Switzerland, which is very fastidious with respect to the quality of its imported brewer's barley, took 113,000 bushels. The bulk of barley exports went to Austria—936,000 bushels of brewer's barley and 377,000 bushels of fodder barley. The quantities taken by other customer countries were as follows: Germany, 420,000 bushels; Yugoslavia, 281,000 bushels. A total of 2,278,000 bushels was exported during the calendar year 1927. This is about one-fourth of the pre-war performance, and it is probable that this low volume of barley exports will not be greatly exceeded in future years. In the first place, the greater peasant influence in Hungarian agriculture that has followed the land reform has tended toward lower yields per acre. There will probably be a greater demand for barley as a feeding stuff for livestock within the country itself.

OATS

Before the World War, residual Hungary seeded 849,000 acres of oats annually. In 1927, only 643,000 acres were planted. The average yield per acre during the 5-year period ended in 1927 was 32.6 bushels, as compared with the 1909–1913 average of 33.5 bushels. This indicates a general trend, since the war toward slightly lower yields. Average net production has decreased (Table 31) from 24,771,000 bushels during 1909–1913 to 20,248,000 bushels for the 5-year period ended 1927.

TABLE 31.—*Oats: Statistical balances of present Hungary, average 1909–1913, and annual 1921–22 to 1928–29*

Crop year	Acreage	Seed [1]	Production		Disappearance		Exportable surplus
			Gross	Net	Statistical	Per horse [2]	
	1,000 acres	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Bushels*	*1,000 bushels*
Pre-war averages: [3]							
1909–1913	849	3,693	28,464	24,771	22,189	[4] 25.10	2,582
Post-war years: [5]							
1921–22	885	3,850	21,964	[6] 18,430	17,870	25.49	[7] 568
1922–23	811	3,528	22,553	19,034	17,479	24.38	[7] 1,555
1923–24	809	3,519	27,458	24,378	20,952	25.71	[7] 3,426
1924–25	708	3,080	15,713	12,594	12,426	14.62	[7] 168
1925–26	717	3,119	25,532	22,578	18,702	21.35	[7] 3,876
1926–27	679	2,954	24,802	22,005	19,637	22.19	[7] 2,368
1927–28	643	2,797	22,513	19,684	18,548	20.54	[7] 1,136
1928–29	650	2,829	23,725	20,896	----	----	----

[1] 4.35 bushels per acre (*10, p. 25*).
[2] See Table 50 for number of horses.
[3] Acreage and production calculated from Magyar Statisztikai Évkön. 1909–1913.
[4] Disappearance per horse as indicated (*10, p. 25*).
[5] Acreage and production 1921–1927 from official records of U. S. Department of Agriculture, Bureau of Agricultural Economics.
[6] Seed for following year subtracted from production for stated year, except average 1909–13, annual 1928–29.
[7] Net exports for years beginning Aug. 1, from Internatl. Yearbook Agr. Statis. 1924–25 and 1927–28.

The peasants seeded only 5.4 per cent of their cereal land to oats, as compared with 10.5 per cent seeded on the large estates during 1926. (Table 1.) The land reform probably has created a permanently depressing influence upon the areas planted to oats. The increased use of motor cars has conspicuously decreased the use of horses in cities. The army has been reduced and is employing motor vehicles in place of horses to a considerable extent. Demand for oats has fallen off, and as a consequence acreage has steadily decreased to a proportion more in keeping with domestic requirements.

Disappearance of oats in recent years has been somewhat less than before the World War. If the poor crop year 1924–25 is excluded, the disappearance of oats between 1922–23 and 1926–27 has averaged 19,192,000 bushels, as compared with 22,189,000 bushels during 1909–1913. During the seasons 1923–24 and 1925–26, net exports of oats were considerably higher than the estimated surplus produced before the World War. During the calendar year 1926, Austria absorbed 77 per cent of the oats exported from Hungary. Czechoslovakia took 13 per cent and Italy 9 per cent. The remaining 1 per cent was divided among Yugoslavia, Switzerland, and Rumania.

The peasants of Hungary do not feed oats to livestock to the extent that this cereal is utilized in central and northwestern Europe. More corn is employed on the small land holdings; therefore, following the land reform, the area seeded to oats in Hungary will probably tend to remain below what was normal before the World War.

The quality of the 1927 crop was excellent; but net production was 2,321,000 bushels below that of 1926. There was thus a tendency to increase domestic prices, which was enhanced by the improvement in the building trade both in Budapest and in the Comitats and by an expansion in road building. Net exports during 1927–28 declined 1,232,000 bushels below those of the season 1926–27. The decline in exports was also affected by favorable harvests in the neighboring States to the west and north. During the greater part of the year, oats were cheaper in Vienna than in Budapest. During the first half of the calendar year 1927 Hungary took a considerable part in supplying the oats required by the Italian Army; but later prices in Hungary rendered this trade unprofitable.

During the calendar year 1927 Hungary exported altogether 1,794,000 bushels of oats. This was apportioned among the various countries as follows: Austria, 1,324,000 bushels; Italy, 249,000 bushels; Czechoslovakia, 198,000 bushels; other countries, 23,000 bushels.

Domestic utilization of oats in Hungary will probably tend to remain below the pre-war average; the result will probably be that net exports, which will fluctuate with seasonal fluctuations in production, will tend to average about the same as before the World War.

TABLE 32.—*Oats: Acreage and production in Hungary, 1877–1928*

Year	Hungary (proper)			Croatia and Slavonia			Total Hungary		
	Acreage	Production	Yield per acre	Acreage	Production	Yield per acre	Acreage	Production	Yield per acre
	1,000 acres	*1,000 bushels*	*Bushels*	*1,000 acres*	*1,000 bushels*	*Bushels*	*1,000 acres*	*1,000 bushels*	*Bushels*
Pre-war years:									
1877	2,686	[1] 40,114	14.93	.....	.....	.....	2,686	40,114	14.93
1878	2,854	[1] 60,168	21.08	.....	.....	.....	2,854	60,168	21.08
1879	2,691	[1] 38,252	14.21	.....	.....	.....	2,691	38,252	14.21
1880	2,515	[1] 61,660	24.52	.....	.....	.....	2,515	61,660	24.52
1881	2,362	[1] 47,810	20.24	.....	.....	.....	2,362	47,810	20.24
1882	2,469	[1] 67,500	27.34	.....	.....	.....	2,469	67,500	27.34
1883	2,454	[1] 51,161	20.85	.....	.....	.....	2,454	51,161	20.85
1884	2,459	[1] 57,089	23.22	.....	.....	.....	2,459	57,089	23.22
1885	2,565	57,774	22.52	277	5,305	19.15	2,842	63,079	22.20
1886	2,602	58,346	22.42	274	5,312	19.39	2,876	63,658	22.13
1887	2,535	65,249	25.24	274	4,650	18.67	2,859	69,899	24.45
1888	2,582	59,965	23.22	264	4,092	15.50	2,846	64,057	22.51
1889	2,515	46,297	18.41	242	2,666	11.02	2,757	48,963	17.76
1890	2,454	56,527	23.03	240	3,899	16.25	2,694	60,426	22.43
1891	2,488	68,859	27.68	235	4,051	17.24	2,723	72,910	26.78
1892	2,481	60,228	26.60	235	3,810	16.21	2,716	70,038	25.79
1893	2,397	72,704	30.33	230	3,879	16.87	2,627	76,583	29.16
1894	2,430	74,036	30.76	230	5,353	23.27	2,666	80,280	30.12
1895	2,377	72,400	30.46	215	4,478	20.83	2,592	76,878	29.66
1896	2,318	74,688	32.22	227	5,346	23.55	2,545	80,034	31.45
1897	2,216	55,060	24.85	235	4,402	18.73	2,451	59,462	24.26
1898	2,340	78,704	33.63	247	7,020	28.42	2,587	85,724	33.14
1899	2,382	81,219	34.10	245	6,318	25.79	2,627	87,537	33.32
1900	2,424	70,637	29.14	247	5,567	22.54	2,671	76,204	28.53
1901	2,427	68,081	28.05	247	5,815	23.54	2,674	73,896	27.64
1902	2,434	82,803	34.02	245	6,304	25.73	2,679	89,107	33.26
1903	2,528	87,330	34.55	250	7,330	29.32	2,778	94,660	34.07
1904	2,456	62,776	25.56	247	4,905	19.86	2,703	67,681	25.04
1905	2,513	78,008	31.04	247	6,076	24.60	2,760	84,084	30.47
1906	2,562	87,720	34.24	252	5,539	21.98	2,814	93,288	33.14
1907	2,653	79,484	29.96	249	4,174	16.76	2,902	83,658	28.83
1908	2,612	70,168	26.86	247	4,253	17.22	2,859	74,421	26.03
1909	2,695	92,269	34.24	247	5,608	22.70	2,942	97,877	33.27
1910	2,640	70,699	26.78	241	4,017	16.67	2,881	74,716	25.93
1911	2,653	80,658	33.79	247	5,553	22.48	2,900	95,211	32.83
1912	2,473	76,758	31.04	237	3,534	14.91	2,710	80,302	29.63
1913	2,884	99,806	34.61	271	6,566	24.23	3,155	106,372	33.72
War years:									
1914	2,603	86,537	33.25	255	5,766	22.61	2,858	92,303	32.30
1915	2,631	80,861	30.73	267	5,367	20.10	2,898	86,228	29.75
1916	2,652	84,591	31.90	281	6,300	22.42	2,933	90,891	30.99
1917	2,586	53,362	20.83	[2]	[2]	.....	2,586	53,362	20.83
1918	2,398	45,928	19.15	[2]	[2]	.....	2,398	45,928	19.15
Post-war years:									
1919	[3]	[3]	[3]	[2]	[2]	.....	[3]	[3]	[3]
1920	802	22,307	27.81	[2]	[2]	.....	802	22,307	27.81
1921	885	21,964	24.82	[2]	[2]	.....	885	21,964	24.82
1922	811	22,553	27.81	[2]	[2]	.....	811	22,553	27.81
1923	809	27,458	33.94	[2]	[2]	.....	809	27,458	33.94
1924	708	15,713	22.19	[2]	[2]	.....	708	15,713	22.19
1925	717	25,532	35.61	[2]	[2]	.....	717	25,532	35.61
1926	679	24,802	36.53	[2]	[2]	.....	679	24,802	36.53
1927	643	22,513	35.01	[2]	[2]	.....	643	22,513	35.01
1928	650	23,725	36.50	[2]	[2]	.....	650	23,725	36.50

1877–1896 from Das Getreide im Weltverkehr, Austria 1900: 50–53.
1897–1904 from Das Getreide in Weltverkehr, Austria 1905: 20–21.
1905–1906 from Das Getreide in Weltverkehr, Austria 1909: 16–17.
1907–1908 from Magyar Statisztikai Évkön. 1910: 100–101.
1909–1912 from Magyar Statisztikai Évkön. 1913: 87–88.
1913–1915 from Magyar Statisztikai Évkön. 1915: 86–87.
1916–1918 from Ann. Statis. Hongrois 1916, 1917, 1918: 40–44, 47–52.
1920 from Ann. Statis. Hongrois 1919–1922: 56–60.
1921–1928 from official records of U. S. Department of Agriculture, Bureau of Agricultural Economics.

[1] Winchester bushels converted from hectoliters.
[2] Ceded to Yugoslavia.
[3] Not available.

CORN

From 1921 the area planted to corn steadily increased in Hungary until 1926. The pre-war average approximated 2,192,000 acres, whereas in 1926 the acreage was 2,631,000 acres. It fell off slightly

to 2,625,000 acres in 1927. Between 1921 and 1923 climatic conditions were unfavorable, and yields per acre were low. Between 1924 and 1926 conditions were more favorable, and net production was relatively high. There was not enough corn produced in 1921 and 1922 to meet the domestic Hungarian requirements (Table 33), and a small net importation was made during each of the calendar years 1922 and 1923.

TABLE 33.—*Corn: Statistical balances of present Hungary average 1909–1913, and annual 1921–22 to 1928–29*

Crop year	Acreage	Seed [1]	Production		Disappearance		Exportable surplus (+) or deficit (−)
			Gross	Net	Statistical	Per capita [2]	
	1000, acres	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Bushels*	*1,000 bushels*
Pre-war average: [3]							
1909–1913	2,192	1,228	60,813	59,585	[4] 58,389	7.68	+ 1,196
Post-war years: [5]							
1921–22	2,167	1,214	31,703	[6] 30,334	30,554	3.79	[7] −220
1922–23	2,445	1,389	48,725	47,348	47,426	5.83	[7] −78
1923–24	2,450	1,377	49,247	47,870	46,657	5.68	[7] +1,213
1924–25	2,459	1,377	74,122	72,635	65,813	7.95	[7] +6,822
1925–26	2,655	1,487	87,999	86,496	80,929	9.37	[7] +5,567
1926–27	2,631	1,473	76,544	75,074	74,717	8.85	[7] +357
1927–28	2,625	1,470	68,347	66,870			
1928–29	2,637	1,477	43,324	41,874			

[1] 0.56 bushel per acre (*10, p. 19*).
[2] For populations see Table 8.
[3] Acreage and production calculated from Magyar Statisztikai Évkön, 1909–1913.
[4] Total corn requirement considered to be equivalent to the average disappearance during 1911–1915 (*10, p. 19*).
[5] Acreage and production 1921–1928 from official records of U. S. Department of Agriculture, Bureau of Agricultural Economics.
[6] Seed for following year subtracted from production for stated year, except for average 1909–1913 and annual 1928–29.
[7] Net imports indicated by (−) and net exports by (+) for calendar years following the crop year from Internatl. Yearbook Agr. Statis. 1925–26 and 1927–28.

Climatical conditions in 1924 brought net production to 13,000,000 bushels above the pre-war normal, all but 6,822,000 bushels of which were absorbed within the country itself. The following year, another bumper crop followed increased acreage and favorable climatical conditions. Only 5,567,000 bushels were exported against 81,000,000 bushels domestic disappearance. It is estimated that about 62,595,000 bushels of corn were fed to hogs and fowls in 1925. Some corn was fed to cattle, horses, and sheep, and some was utilized industrially but, unlike the custom of Rumania and Yugoslavia, almost no corn was employed as human food.

Although, in 1926, the area planted was 2,631,000 acres (only 24,000 acres below the area of the previous year) the net production was 11,422,000 bushels less. The quality of the crop was good; but on account of smaller production, domestic prices rose, and net exports fell off.

Most of the corn exported during the calendar year 1926, about 3,721,000 bushels went to Czechoslovakia. Austria took 1,522,000 bushels. The balance went to other countries, including Germany, Italy, and Switzerland.

The corn crop of 1927 was adversely affected by frosts in May. Rains in September and subsequent warm weather greatly improved the injured crop; but the final net production was 8,204,000 bushels

below that of the previous year. Prices rose, and export stagnated. During the first part of the calendar year 1927 some old corn of the previous crop was shipped abroad; but during the second half, corn was imported. The gross exports reached 1,352,000 bushels, which was scarcely a quarter of the exports of the preceding year (5,569,000 bushels). The leading customers were Czechoslovakia, which took 818,000 bushels, and Austria, which took 486,000 bushels.

The depressed state of the Vienna livestock market, as compared with the great numbers of cattle and swine in demand before the World War, has had a profound effect upon the feed-lot industry in the territories now comprising Hungary. In pre-war days thousands of lean animals, as well as large quantities of feeding stuffs, were shipped to the feed lots near Budapest and in the western Comitats where fat stock was prepared for the Vienna market. It is probable that as Vienna recovers its purchasing power the feed-lot industry of Hungary will be revived and that not only will all domestically produced corn be fed at home but further quantities may be imported from Rumania and Yugoslavia.

Late in 1927, the Ministry of Agriculture allowed the duty-free import of 995,000 bushels of corn, principally from Yugoslavia and Rumania, for use in the transit-fattening business. Under these provisions, commercial feeding organizations are allowed to import corn for reexport in the form of pork and lard.

Increased acreage and production of corn in Hungary is probably an after effect of the land reform. It is probable, also, that the disappearance of corn will increase in Hungary since the general trend of peasant agriculture will be to raise more corn and hogs in proportion to the area of plowland than was customary on the large estates where oat production in connection with horse breeding was preferred to corn and swine.

TABLE 34.—*Corn: Acreage and production in Hungary, 1877–1928*

Year	Hungary (proper)			Croatia and Slavonia			Total Hungary		
	Acreage	Production	Yield per acre	Acreage	Production	Yield per acre	Acreage	Production	Yield per acre
Pre-war years:	*1,000 acres*	*1,000 bushels*	*Bushels*	*1,000 acres*	*1,000 bushels*	*Bushels*	*1,000 acres*	*1,000 bushels*	*Bushels*
1877	4,340	[1] 54,200	12.47				4,346	54,200	12.47
1878	4,680	[1] 102,864	21.98				4,680	102,864	21.98
1879	4,633	[1] 65,957	14.24				4,633	65,957	14.24
1880	4,011	[1] 98,769	21.42				4,011	98,769	21.42
1881	4,438	[1] 81,913	18.46				4,438	81,913	18.46
1882	4,680	[1] 107,523	22.98				4,680	107,523	22.98
1883	4,507	[1] 87,231	19.35				4,507	87,231	19.35
1884	4,586	[1] 90,341	19.70				4,586	90,341	19.70
1885	4,633	111,399	24.04	701	11,725	16.41	5,304	123,123	22.83
1886	4,720	86,251	18.24	773	13,653	17.66	5,502	99,904	18.16
1887	4,517	75,271	16.66	773	11,149	14.42	5,290	86,420	16.34
1888	4,608	97,392	21.14	791	13,562	17.15	5,399	110,954	20.55
1889	4,789	104,549	21.83	798	12,944	16.22	5,587	117,493	21.03
1890	4,774	91,412	19.15	815	13,354	16.39	5,589	104,766	18.75
1891	4,972	149,041	29.97	857	16,247	18.96	5,829	165,288	28.35
1892	5,162	118,954	23.04	867	16,231	18.72	6,029	135,185	22.42
1893	5,063	137,134	27.09	877	15,861	18.09	5,940	152,995	25.76
1894	4,996	70,091	14.03	902	12,610	13.98	5,898	82,701	14.02
1895	5,308	146,031	27.51	902	18,735	20.77	6,210	164,766	26.53
1896	5,145	131,248	25.51	904	18,203	20.24	6,049	149,546	24.72
1897	4,912	103,904	21.15	882	14,609	16.56	5,794	118,513	20.45
1898	5,224	127,383	24.38	966	20,463	21.18	6,190	147,846	23.88
1899	5,761	115,982	22.05	909	14,650	16.15	6,170	130,632	21.18

[1] Winchester bushels converted from hectoliters.

TABLE 34.—*Corn: Acreage and production in Hungary, 1877–1928*—Continued

Year	Hungary (proper)			Croatia and Slavonia			Total Hungary		
	Acreage	Production	Yield per acre	Acreage	Production	Yield per acre	Acreage	Production	Yield per acre
	1,000 acres	*1,000 bushels*	*Bushels*	*1,000 acres*	*1,000 bushels*	*Bushels*	*1,000 acres*	*1,000 bushels*	*Bushels*
Pre-war years—Contd.									
1900	5,478	127,654	23.30	917	18,692	20.38	6,395	146,346	22.88
1901	5,434	127,387	23.44	959	20,467	21.34	6,393	147,854	23.13
1902	5,352	104,545	19.53	937	15,255	16.28	6,289	119,800	19.05
1903	5,604	135,748	24.22	974	23,774	24.41	6,578	159,522	24.25
1904	4,853	59,398	12.24	976	11,366	11.65	5,829	70,764	12.14
1905	5,248	94,046	17.93	988	18,385	18.61	6,234	112,431	18.04
1906	5,715	162,924	28.51	1,006	29,472	29.35	6,721	183,395	27.29
1907	6,032	155,617	25.80	988	17,934	18.15	7,020	173,551	24.72
1908	5,831	146,122	25.06	1,004	20,278	20.20	6,835	166,400	24.35
1909	6,061	161,881	26.71	1,001	21,751	21.72	7,062	183,612	26.00
1910	5,998	187,753	31.30	996	25,758	25.86	6,994	213,491	30.52
1911	6,090	137,421	22.57	1,024	24,007	23.44	7,114	161,428	22.69
1912	6,022	176,605	29.34	1,045	24,065	23.03	7,067	200,761	28.41
1913	6,129	182,968	29.71	1,077	28,955	26.88	7,206	211,923	29.28
War years:									
1914	6,015	172,309	28.65	1,057	25,865	24.47	7,002	198,174	28.30
1915	6,084	160,160	26.32	1,043	15,495	14.86	7,127	175,655	24.65
1916	5,829	93,316	16.01	1,082	12,267	11.34	6,911	105,583	15.28
1917	5,778	103,618	17.93	(1)	(1)	.....	5,778	103,618	17.93
1918	5,569	94,378	16.95	(1)	(1)	.....	5,569	94,378	16.95
Post-war years:									
1919	(2)	(2)	(2)	(1)	(1)	.....	(2)	(2)	(2)
1920	2,017	50,163	24.87	(1)	(1)	.....	2,017	50,163	24.87
1921	2,167	31,703	14.63	(1)	(1)	.....	2,167	31,703	14.63
1922	2,445	48,725	19.93	(1)	(1)	.....	2,445	48,725	19.93
1923	2,459	49,247	20.03	(1)	(1)	.....	2,459	49,247	20.03
1924	2,459	74,122	30.14	(1)	(1)	.....	2,459	74,122	30.14
1925	2,655	87,969	33.13	(1)	(1)	.....	2,655	87,969	33.13
1926	2,631	76,544	29.09	(1)	(1)	.....	2,631	76,544	29.09
1927	2,625	68,347	26.04	(1)	(1)	.....	2,625	68,347	26.04
1928	2,637	43,324	16.43	(1)	(1)	.....	2,637	43,324	16.43

1877–1896 from Das Getreide im Weltverkehr, Austria, 1900: 50–53.
1897–1904 from Das Getreide im Weltverkehr, Austria, 1905: 20–21.
1905–6 from Das Getreide im Weltverkehr, Austria, 1909: 16–17.
1907–1908 from Magyar Statisztikai Évkön. 1910: 100–101.
1909–1912 from Magyar Statisztikai Évkön. 1913: 87–88.
1913–1915 from Magyar Statisztikai Évkön. 1915: 85–86.
1916–1918 from Ann. Statis. Hongrois, 1916, 1917, 1918: 40–44, 47–52.
1920 from Ann. Statis. Hongrois, 1920–1922: 56, 60.
1921–1928 from official records of U. S. Department of Agriculture, Bureau of Agricultural Economics.

[1] Ceded to Yugoslavia. [2] Not available.

POTATOES

The territories comprising residual Hungary were just about self-sufficient before the World War, as far as potatoes were concerned. In the spring new potatoes were shipped into Budapest from the southern Comitats now part of Yugoslavia. Later in the season the central Comitats, now constituting Hungary, shipped potatoes to Vienna and Prague. But this trade was unimportant. Only small quantities of potatoes were used industrially, as compared with the quantities in regions like Slovakia, Bohemia, and Galicia, where abundant rainfall makes potatoes a crop of primary agricultural importance. Relatively small quantities of potatoes are fed to swine in Hungary, where pork production, as in the United States, is associated with corn production and is not dependent upon the potato crop, as is the case in Germany and Poland.

The Austrian Government has published estimates of the potato requirements of each of the districts of the old Austro-Hungarian Monarchy (*1, p. 515*), placing the per capita human consumption in the old Kingdom of Hungary at 1.17 quintals or 4.30 bushels per

capita. Conditions in the Comitats comprising residual Hungary were about average for the old Kingdom, and this figure may be accepted as representing the pre-war human food requirements of Budapest and the Comitats now comprising the Hungarian State.

The pre-war quantity of potatoes utilized industrially or fed to livestock has been estimated at about 30 per cent of the net production; that is, gross production, less seed, less 10 per cent for decay and for potatoes that have otherwise become unavailable for utilization. The pre-war potato situation in residual Hungary which has been based upon Austrian governmental estimates, may be considered to be approximated by the data in Table 35. The area planted averaged 619,000 acres; which produced 71,118,000 bushels gross, or 48,005,000 bushels net. Of this amount, 32,710,000 bushels were consumed annually as human food, and 14,401,500 bushels were fed to livestock or utilized industrially. The resulting small statistical surplus during 1909–1913 averaged 893,000 bushels per year.

TABLE 35.—*Potatoes: Statistical balances of present Hungary, average 1909–1913, and annual 1921–22 to 1928–29*

Crop year	Acreage	Seed [1]	Production		Disappearance		Exportable surplus (+) or deficit (−)
			Gross	Net [2]	Total	Per capita [3]	
	1,000 acres	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Bushels*	*1,000 bushels*
Pre-war average: [4]							
1909–1913	619	16,001	71,118	48,005	[5] 47,112	6.19	+893
Post-war years: [6]							
1921–22	665	17,190	45,808	24,893	24,138	2.90	[7] +755
1922–23	635	16,415	48,490	26,942	27,343	3.36	[7] −401
1923–24	646	16,699	49,024	28,302	27,372	3.33	[7] +930
1924–25	612	15,820	56,406	34,118	33,509	4.05	[7] +609
1925–26	644	16,647	84,859	60,372	59,250	7.08	[7] +1,122
1926–27	619	16,001	68,880	45,396	40,401	4.80	[7] +4,995
1927–28	642	16,596	73,666	49,367	46,916	5.51	[7] +2,451
1928–29	655	16,932	47,280	25,620			

[1] 25.85 bushels per acre (*10, p. 27*).
[2] 10 per cent of gross production deducted for decay and other losses and seed for following year subtracted from production for stated year, except average for 1909–1913, and annual 1928–29.
[3] For populations, see Table 8.
[4] Acreage and production calculated from Magyar Statisztikai Évkön. 1909–1913.
[5] Human consumption, 4.3 bushels per capita (*1, p. 515*). Industrial and livestock consumption, 30 per cent of net production, or 14,401,500 bushels.
[6] Acreage and production 1921–1925 from official records of U. S. Department of Agriculture, Bureau of Agricultural Economics.
[7] Net imports indicated by (−) and net exports by (+) for calendar years from Internatl. Yearbook Agr. Statis. 1924–25 and 1927–28.

The acreage of potatoes was increased during 1921, 1922, and 1923; yet net production was only about half of the pre-war normal because of climatic conditions and the low quality of seed potatoes employed. Before the World War it had been customary to renew seed potatoes every two or three years with importations from Germany or Slovakia; but after the war this practice was discontinued until 1922. In this year and in 1923, the Government distributed seed potatoes from Germany and Poland, gratis, on the condition that the growers would turn over to the Government for further distribution a quantity of potatoes from the new crop equal to one and one-half times the quantity of seed potatoes received.

It is probable that the yields from 1924 to 1927, which were higher than those of the three preceding years, were somewhat benefited by this improvement in seed. However, these four seasons were favorable to the development of potatoes, and the 1925 and 1927 net production exceeded the pre-war average. Up through 1924 dis-

appearance of potatoes was far below the pre-war average; nevertheless, with the exception of 1922, potatoes were exported each year.

There are seven starch factories and five large distilleries in Hungary. These factories, which use wheat, corn, and rice as well as potatoes, worked only part time in 1924. The starch factories worked at about one-third capacity and the distilleries at about one-tenth capacity. It is probable that few potatoes were fed to stock during these years and that human consumption was also reduced.

In 1925 the use of potatoes was probably a little above the pre-war normal, and 1,122,000 bushels (net) were exported abroad. The crop was of record proportions, reaching 60,372,000 bushels (net), as compared with an average of 48,005,000 bushels during 1909–1913. The cheap price of Hungarian potatoes in the fall and winter of 1925–26 stimulated demand from foreign countries, and 4,987,000 bushels gross were exported during the calendar year 1926. This remarkable rise in exports followed heavy purchases (2,737,000 bushels) by Austrian distilleries. Czechoslovakia took 1,246,000 bushels; Greece, 501,000 bushels; Switzerland, 171,000 bushels; Yugoslavia, 127,000 bushels; Italy, 108,000 bushels; Germany, 79,000 bushels; and other countries, 18,000 bushels.

Hungary imported 81,915 bushels during 1926 from Austria and Yugoslavia.

The crop of 1927 exceeded that of 1926 by 3,971,000 bushels (net); yet the exports were less than those of the previous season, totaling 2,662,000 bushels gross. The greatest part of these exports, 893,000 bushels, went to Austria. Exports to other countries were as follows: To Greece, 496,000 bushels; to Czechoslovakia, 486,000 bushels; to Yugoslavia, 466,000 bushels; to Italy, 173,000 bushels; to Germany, 142,000 bushels; and to other countries, 6,000 bushels.

Hungary imported 211,000 bushels of potatoes in 1927 from Yugoslavia, Rumania, and Italy.

Domestic trade in potatoes was slack throughout 1927, and it is remarked as a new phenomenon by experts that the consumption of potatoes, in recent years, has diminished considerably (*3*).

SUGAR BEETS AND BEET SUGAR

Just as the beet-sugar industry of the Austrian Empire was financed and controlled largely from Vienna, so in the former Kingdom of Hungary this industry was controlled by a few banks in Budapest and one or two financially powerful families. The 31 [27] factories and refineries located in the old Kingdom of Hungary were closely affiliated with the 192 [27] factories located in the old Empire of Austria. Most of the former Hungarian factories were situated outside the present frontiers of Hungary. Hence, when the country was partitioned, following the treaty of Trianon, 8 factories in Slovakia went to Czechoslovakia, 2 in Transylvania went to Rumania, 4 in Voivodina and 1 in Croatia and Slavonia went to Yugoslavia, and 3 in Burgenland went to Austria. Hungary retained 11 factories, producing both raw and refined sugar, and 2 refineries.

During the five sugar seasons September 1, 1909, to August 31, 1914, the 11 factories [28] now located in Hungary worked on the average

[27] The number of factories in operation during any one year varied considerably before the World War. During the sugar season 1913–14 there were 31 factories reported to be in operation in Hungary and 187 in operation in Austria, where 5 factories did not report operations during that season.

[28] Two factories, one at Sarkad in the Comitat of Bihar and one at Eresi in Fijer Comitat, operated only the last two seasons of this period, as is noted in Table 36.

1,607,914 short tons of beets and produced 222,306 short tons of raw sugar, as is indicated in Table 36.

TABLE 36.—*Sugar beets worked and sugar produced at factories in operation in Hungary, present boundary, average 1909–10 to 1913–14*

Comitat and site of factory	Sugar beets worked at factory	Sugar produced in terms of raw sugar
	Short tons	*Short tons*
Bihar, Sarkad	[1] 139, 537	[1] 18, 438
Csanad, Mezohegyes	175, 077	23, 549
Fejer, Ercsi	[1] 91, 789	[1] 11, 867
Heves, Hatvan	301, 606	44, 469
Komarom, Acs	134, 447	19, 248
Nograd, Selyp	122, 924	15, 424
Somogy, Kaposvar	147, 648	20, 220
Sopron, Nagycenk	[2] 68, 201	[2] 10, 633
Sopron, Petohaza	[1] 69, 838	[1] 9, 942
Vas, Sarvar	184, 051	23, 765
Zemplen, Szerencs	[3] 173, 797	[3] 25, 383
Total	1, 607, 914	222, 306

From Magyar Statisztikai Evkön, 1910 to 1914 Tables on "Fabrication du sucre".

[1] 2-year average 1912–13 and 1913–14.

[2] 3-year average 1909–10 to 1911–12. Not separately stated for the last 3 years.

[3] One-half of the beets worked and sugar produced at 2 factories reported to be in operation in Zemplen in 1912–13 and 1913–14 averaged with the separate data for the Szerencs plant for 1909–10 to 1911–12.

It has been estimated that during 1909–1913 the area planted to sugar beets within the territories now constituting Hungary averaged 131,000 acres and produced annually 1,513,000 short tons of sugar beets. The 11 sugar factories thus worked up annually about 95,000 tons of beets produced in territories outside the frontiers of present-day Hungary. It required on an average 7.233 tons of beets to produce 1 ton of raw sugar during this period, so that had the 1,513,000 short tons of domestically produced beets been put through the sugar factories, they would have yielded the equivalent of 209,000 short tons of raw sugar.

TABLE 37.—*Acreage and production of sugar beets and production of sugar in Hungary, present boundary, average 1909–10 to 1913–14, and annual 1921–22 to 1927–28*

Year beginning September 1	Sugar beets		Raw sugar
	Acreage	Production	Production
	1,000 acres	*Short tons*	*Short tons*
Pre-war average: 1909–10–1913–14	131	[1] 1,513,000	[2] 222,306
Post-war years: [3]			
1921–22	103	598,488	67,096
1922–23	103	783,896	90,259
1923–24	123	951,934	136,073
1924–25	168	1,404,554	222,838
1925–26	163	1,683,685	185,128
1926–27	156	1,592,400	192,906
1927–28	159	1,604,311	205,779
1928–29 [4]	164	1,212,761	220,000

Pre-war acreage and production of sugar beets from U. S. Dept. Agr. Yearbook 1926, 1008. Sugar produced, see Table 36.

Post-war acreage and production of sugar beets and production of sugar from official records of U. S. Department of Agriculture, Bureau of Agricultural Economics.

[1] An additional 95,000 short tons of beets imported from present Rumania, Yugoslavia, and Austrian territory were worked up at the factories of residual Hungary.

[2] Includes the sugar produced from the 95,000 short tons of beets indicated in footnote 1. Using the same yield of sugar per ton of beets as indicated in Table 36 to estimate the total sugar produced from the pre-war production of sugar beets in present Hungary, would be equivalent to 209,000 short tons.

[3] The post-war sugar production figures include sugar produced at a factory in Szolnok built during the war, with a daily capacity of 1,500 short tons, and after 1923 includes a factory established in Budapest in 1923, with a daily capacity of 66 carloads, or 728 short tons of beets daily.

[4] Preliminary.

Aside from the citizens of Budapest and of a few large centers, the rank and file of Hungarians use very little sugar. Unlike the Austrian peasants, who include coffee in their diet, the Hungarian peasants seldom use either tea or coffee. Furthermore, honey is widely employed as the sweetening agent in the ordinary household cooking rather than sugar. The total statistical disappearance of raw sugar in the old Kingdom of Hungary, including Croatia and Slavonia, averaged 15.86 pounds per capita during the sugar season 1909–10; whereas in 1913–14 per capital disappearance reached 24.38 pounds.[29]

During the five sugar seasons ended 1913–14, the average statistical disappearance of raw sugar in the old Kingdom of Hungary was 211,203 short tons. Assuming that the annual per capita consumption of sugar in Budapest was at least equivalent to the household consumption in Vienna (47 pounds per capita) and employing the 1910 population of 880,371, the annual pre-war requirement of the Hungarian capital would have amounted to practically 20,689 short tons. This would indicate that 190,514 short tons were consumed in provincial Hungary, which prorated over the 20,006,116 provincial population gives a rough approximation of about 19 pounds per capita.

The 1910 population of the area comprised within the boundaries of the present Kingdom of Hungary has been estimated at 7,606,971. Assuming that the 6,726,600 provincial inhabitants consumed at least as much sugar as the average of the old Kingdom, the provincial pre-war requirement of residual Hungary would have been approximately 63,903 short tons. Adding the requirement of Budapest, or 20,689 short tons,[30] gives 84,592 short tons, or 22.2 pounds per capita as the average pre-war sugar disappearance of Hungary, present boundaries.

During the season 1921–22, when sugar production decreased to 67,096 short tons, about 10,965 short tons of sugar were imported, and the citizens of Budapest were reported to have resorted to the use of saccharine. After adding the visible supply at the beginning of the season and deducting the visible supply at the end of the season as well as exports during the 12 months, the resultant statistical disappearance was about 74,630 short tons. (Table 38.) Prorating this amount over the 1921 estimated population of 8,065,537 gives an average per capita disappearance of 18.5 pounds.

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[29] This latter figure is only a little more than half of the average pre-war household disappearance of sugar in the territories comprising the present Republic of Austria and including the high consumption center of Vienna, which in 1912-13 was approximately 43.6 pounds per capita.

[30] During the sugar season Sept. 1, 1924, to Aug. 31, 1925, cheap sugar brought provincial consumption up to 51,861 short tons, whereas Budapest consumed 43,084 short tons in terms of raw sugar. (MORGAN, J. H. Cons. Rpt. Aug. 23, 1926.) [Typewritten copy on file in Bureau Agricultural Economics Library.]

TABLE 38.—*Sugar in terms of raw: Approximate supply and distribution of present Hungary, average 1909–10 to 1913–14, and annual 1921–22 to 1927–28*

Item	Average 1909–10 to 1913–14	1921–22	1922–23	1923–24	1924–25	1925–26	1926–27	1927–28
	Short tons	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*
Visible supply on Sept. 1		[1] 3,657	[1] 7,088			19,671	4,834	8,270
Net production	[2] 222,306	[3] 67,096	[4] 90,259	[5] 136,073	[3] 222,838	[3] 183,128	[6] 192,968	[11] 205,799
Importation		[5] 10,965	[6] 1,028	[5] 162				
Total	222,306	81,718	98,375	136,235	222,838	202,799	197,832	214,069
Exportation			[5] 55,417	[5] 90,145	[7] 108,493	[7] 95,332	[5] 78,599	[12] 84,309
Visible supply on Aug. 31		[1] 7,088			[9] 19,671	[8] 4,834	[10] 8,270	[13] 10,506
Total export and on hand at end of year	[9] 137,714	7,088	55,417	90,145	128,164	100,166	86,869	94,815
Disappearance	[14] 84,592	74,630	42,958	46,090	[7] 94,674	[7] 102,633	110,963	119,254

Refined: raw :: 1:1.14.

[1] Report of Vice Consul Digby A. Willson, Oct. 25, 1922, Budapest.
[2] See Table 37.
[3] Ann. Internatl. Inst. 1922: 48–49.
[4] Magyar Statisztikai Szemle January, 1924: 38.
[5] Magyar Statisztikai Szemle November–December, 1924.
[6] Report of Consul Walter S. Reineck, Dec. 3, 1924.
[7] Hungarian Commerce and Industry in the year 1926 (*8, p. 88*).
[8] From report of Vice Consul John H. Morgan dated Nov. 21, 1927, Budapest.
[9] By difference.
[10] From report of Vice Consul John H. Morgan dated Oct. 20, 1927, Budapest.
[11] From official records of U. S. Department of Agriculture, Bureau of Agricultural Economics.
[12] From Commerce and Industry of Hungary in the year 1927 (*8, p. 126*).
[13] From report of Vice Consul John H. Morgan dated Sept. 20, 1928, Budapest.
[14] Disappearance discussed in text.

It is comparatively easy to keep the production, distribution, and retail sale of sugar under the inspection of Government officials. Also, sugar has a relatively high taxable value in proportion to its bulk, and each of the succession States has fostered its production as a means of building up national income. About January 1, 1921, the Hungarian Government fixed the domestic sales price of sugar and decreed that 47.8 per cent of this price should accrue to the account of the State. At the same time, the Government pledged its sugar revenues thus obtained as security for a reconstruction loan for which Hungary was negotiating abroad.

Thus an indirect tax was levied by the Government on all consumers of sugar through what it designated as Treasury participation.[31] This participation so raised the price of sugar that consumption decreased during the season of 1922–23 to about 43,000 short tons. During the season 1923–24, consumption continued far below normal, and saccharine was widely employed as a substitute. During these years the cost of sugar to the foreign buyer in Hungary was less than that in Czechoslovakia because of the lower exchange rate of the Hungarian crown in terms of foreign currency, and in 1924 the entire surplus of the factories of Hungary is reported to have been bought up by foreign buyers. The equivalent of more than 90,000 short tons of raw sugar was sent abroad during the season 1923–24, the greater portion going to Italy.

[31] Treasury participation amounted to 35.61 per cent of the sales price on Jan. 1, 1923, and rose to 53.5 per cent by December, 1924. Reineck, W. S., Cons. Rpt. Dec. 6, 1924, Bowman, T. D., Cons. Rpt. July 13, 1926. [Typewritten copies on file in Bureau Agricultural Economics Library.]

By December, 1925, the degree of Treasury participation was decreased to 41.4 per cent of the purchase price. Prices remained fairly stable during 1925, and domestic consumption increased rapidly to about 102,600 short tons during 1925–26. As a result, the income to the State was greater than when the higher rate of participation was levied.

On account of the importance of domestic sugar sales as a source of internal revenue and the exports of sugar as a means of reducing the adverse trade balance of the country, the Government has taken every means of increasing sugar-beet production.

Sugar-beet production in Europe has always been an industry essentially associated with large-estate farming. As indicated in Table 1, 89.1 per cent of the sugar-beet acreage in 1926 was planted by farmers operating 142.2 acres or more. Small peasants are not equipped to grow beets as well as are the large operators and do not obtain such large returns per acre. The beets produced by large operators in 1926 represented about 90 per cent of the total crop.

The acreage of sugar beets has increased rapidly since the World War. The 1921–22 crop was produced on 103,000 acres, whereas for 1924–25 a total of 168,000 acres was planted, as compared with an average of 131,000 acres before the war. (Table 37.) The large acreage in 1924 followed material support given to the producers by the manufacturers in the way of loans on favorable terms, enabling the farmers to purchase much-needed implements. There was a falling off in 1925 of 5,000 acres, and in the following year about 7,000 additional acres went out of cultivation. This was the consequence of world overproduction in sugar, the slump in the price of sugar in foreign markets being reflected in a decrease in the prices paid for beets to the growers in Hungary.

The low price of sugar in Hungary during 1925–26 resulted in an increase in domestic consumption. The amount of sugar taxed for home use during the season was equivalent to 102,633 short tons of raw sugar. About 95,000 short tons were exported. The quantity of sugar taxed for home use in Hungary during the season 1925–26 is considerably larger than the estimated pre-war disappearance, but is still only 24.6 pounds per capita, as compared with 36.7 pounds in Austria and 61.2 pounds in Czechoslovakia.

Production of sugar in 1926–27 was reported by the International Institute of Agriculture in Rome at 193,000 short tons. The following year, 1927–28, unofficial estimates placed production at 206,000 short tons, an increase of 6.7 per cent. Exports of sugar in terms of raw sugar amounted to 83,199 short tons in the calendar year 1926, as compared with 84,309 short tons in 1927. This is an increase of only 1.3 per cent.

The export of 1927 did not respond more nearly to the increased production of that year over 1926 because, in the first place, the conditions of the world market were unfavorable, also because domestic consumption increased, so that there remained a relatively smaller proportion of the production available for export than in 1926 (*3*).

In all of the other succession States the acreage of sugar beets shows a tendency to fluctuate with conditions of the world market and the price paid to growers. Particularly is this so in Hungary, because such a large percentage of the area grown is on large-estate lands,

whose management is more sensitive to economic changes than is that of peasant lands.

Table 39 indicates the sugar trade of Hungary in terms of raw sugar by countries during the calendar years 1925 to 1927.

TABLE 39.—*Sugar in terms of raw:* [1] *Exports from Hungary by countries, calendar years 1925–1927*

Country	1925	1926	1927
	Short tons	*Short tons*	*Short tons*
Fiume	76,467	44,599	55,717
British India and Straits Settlements	4,915	22,619	2,634
Austria	10,290	9,583	9,970
Bulgaria	2,905	38	333
Switzerland	0	1,377	2,256
Italy	1,288	0	0
Trieste	5,240	1,137	5,574
Egypt	(2)	848	3,437
Greece	(2)	785	270
European Turkey	(2)	647	748
Other countries	5,773	1,566	3,370
Total	106,018	83,199	84,309

1925 and 1926 from Statisztikai Havi Közlemények October-December, 1925, and October-December, 1926. 1927 from Commerce and Industry of Hungary in the Year 1927 (3).

[1] Refined converted to raw on the basis, raw : : refined : 1.14 : 1.
[2] If any, included in other countries.

According to Vice Consul John H. Morgan,[32] an expansion of the sugar industry of Hungary is not to be expected, as difficulties have been experienced in finding markets in foreign countries. On the contrary, if the difficulties in meeting foreign competition abroad continues, Hungarian manufacturers may be compelled to reduce production.

TOBACCO

Under the Austro-Hungarian Monarchy, the entire tobacco industry from planting to the manufacture of the cured leaf was under the control of the Royal Hungarian Tobacco Monopoly. Naturally, after the segregation of Hungary from the territories ceded to the surrounding succession States, the tobacco industry has continued to be handled as a Government monopoly. The districts included within the boundaries of the present State planted 93,000 acres to tobacco yearly before the World War and produced an average of 111,883,000 pounds during 1909–1913. (Table 40.)

[32] MORGAN, J. H. THE HUNGARIAN SUGAR INDUSTRY. Cons. Rpt. Nov. 26, 1927, 8 p. 1927. [Typewritten copy on file in Bureau Agricultural Economics Library.]

TABLE 40.—*Tobacco: Statistical balance of Hungary, present boundary, average 1909–1913, and annual 1921–1927*

Year	Acreage	Production	Disappearance		Exportable surplus (+) or deficit (−)
			Total	Per capita[1]	
	1,000 acres	*1,000 pounds*	*1,000 pounds*	*Pounds*	*1,000 pounds*
Pre-war average:					
1909–1913	93	111,803	19,244	[2] 2.53	+92,659
Post-war years:					
1921	49	40,705	40,684	5.04	[3] +21
1922	44	34,393	32,334	3.97	+2,059
1923	38	29,762	26,838	3.26	+2,924
1924	38	38,045	33,800	4.08	+4,345
1925	38	37,609	37,637	4.50	−28
1926	[4] 59	[4] 57,823	65,016	7.70	−7,193
1927	58	[5] 60,095	58,224	8.01	+871

1921–1925 acreage and production from U. S. Dept. Agr. Yearbook 1931: 825–826; 1925: 1025–1027; 1926: 1029.

1927 International Yearbook of Agricultural Statistics 1927–28.

[1] For populations see Table 3.

[2] Average 1909–1913 per capita amount of tobacco sold in the old Kingdom of Hungary from Magyar Statisztikai Évkön. 1911: 194; 1914: 132.

[3] Net exports (+) and net imports (−) 1921 to 1927 from Statisztikai Havi Közlemények 1921–1927.

[4] Commerce and Industry of Hungary in the Year 1927 (5).

Two types of tobacco are grown in Hungary—a heavy-leaf tobacco and a small-leaf variety used for cigarettes and smoking tobacco. The latter variety is not of outstanding importance. Only 271 acres, which produced 193,000 pounds, were planted in 1926. There were seven local varieties of broadleaf tobaccos of commercial importance. These varieties and their acreage and production in 1926 were as follows: Debrecen, 30,419.4 acres, producing 30,911,000 pounds; Tisza, 17,039 acres, producing 15,857,000 pounds; Erti, 4,425 acres, producing 5,595,000 pounds; Szeged, 2,529 acres, producing 2,111,000 pounds; Szolnok, 1,897 acres, producing 1,149,000 pounds; Szentandras muscat, 380 acres, producing 260,000 pounds; and Kapa, 1,871 acres, producing 1,746,000 pounds. The last-named variety is a coarse, low-grade tobacco. It is called kapa (Hungarian for hoe) because it is smoked chiefly by farm laborers. Some of this tobacco is used for making cigars, but most of it goes into cigarettes and pipe tobacco. One sort of tobacco, Debrö, was grown experimentally, only 1.4 acres were planted, which produced 1,000 pounds.

In all, 58,833 acres of tobacco produced 57,823,000 pounds of leaf in 1926. The acreage planted to tobacco is regulated by the monopoly to meet domestic requirements and to afford only such surplus as can be exported profitably.

During the fiscal year 1926–27 the monopoly manufactured 26,577,000 pounds of tobacco, as compared with 26,949,000 pounds in 1925-26. The native tobacco employed was 20,627,000 pounds in 1926–27 as compared with 21,068,000 pounds during the preceding year. In 1926–27 the monopoly used 5,950,000 pounds of imported tobacco as compared with 5,881,000 pounds in 1925–26.

The manufactured products included 10,667,000 pounds of common pipe tobacco, 7,820,000 pounds of fine pipe and cigarette tobacco, 252,000 pounds special pipe and cigarette tobacco, and 1,532 pounds of snuff. They also made 35,071,000 special and 2,154,602,000

common cigarettes, as well as 3,344,000 special and 91,279,000 common cigars.

INTERNATIONAL TRADE IN TOBACCO

Tobacco is imported into Hungary only by the Royal Hungarian Tobacco Monopoly. Leaves for cigar binders and wrappers are purchased exclusively at the auctions of Amsterdam and Rotterdam. Fillers (Havana, Brazil, Cuba, Java, etc.) are purchased chiefly on the basis of offers submitted to the Regie (monopoly) through German agents. * * * Tobacco for the manufacture of pipe and cigarette tobacco (Turkish, Bulgarian, Greek, and Russian) are purchased by agents of the monopoly who are sent out after offers have been received from producers or middlemen in these countries.[33]

This trade does not affect the farmers of North America directly because no Hungarian tobacco is sold in the United States and very little tobacco from the United States has been purchased by the Hungarian Tobacco Monopoly since the World War. A small quantity of Virginia and Kentucky tobacco was purchased in 1922. This supply was sufficient to meet the needs of the monopoly until 1925, when the last of these purchases was worked up into pipe tobacco. Because the quantity of United States grown tobacco used in Hungary is very small, it is probable that the depleted stock will be replenished by purchases in European markets rather than by purchase from the United States direct.

During 1927 Hungary imported 7,886,075 pounds of raw tobacco, as compared with 10,433,270 pounds the previous year, and 253,309 pounds of manufactured tobacco during 1927, as compared with 22,266 pounds in 1926. The countries of origin are indicated in Table 41.

TABLE 41.—*Tobacco: Imports and exports of Hungary by countries, calendar years 1926 and 1927*

Country	1926		1927	
	Imports	Exports	Imports	Exports
Raw:	*Pounds*	*Pounds*	*Pounds*	*Pounds*
Bulgaria	5,024,064		4,972,035	
Asiatic Turkey	3,465,190		1,592,162	
Greece	1,118,394		146,386	
Italy	513,672		345,240	
Holland	197,311	253,750		
Germany	114,639	276,015	224,869	336,643
Austria		1,247,142		3,253,990
Poland		783,956		2,667,125
Belgium		435,400		322,538
France		188,493		113,757
Czechoslovakia		55,115		1,956,362
Netherlands			605,383	46,076
Egypt				60,496
Total	10,433,270	3,239,880	7,886,075	8,756,892
Manufactured:				
Great Britain	15,653		78,925	220
Egypt	3,307		115,301	
Belgium	2,645			
Denmark		220		882
European Turkey	(a)	(a)	55,335	
Switzerland	(a)	(a)		2,867
Other countries	601		3,748	220
Total	22,266	220	253,309	4,189

From Statisztikai Havi Közlemények, October-December, 1926, and October-December, 1927.

[a] If any, included in other countries.

[33] HORTON, G. REPORT CONCERNING THE CULTURE, PRODUCTION, AND TRADE ON TOBACCO. Cons. Gen. Rpt. Jan. 23, 1924, 10 p. 1924. [Typewritten copy on file in Bureau Agricultural Economics Library.]

The imports of manufactured tobacco were more than ten times as great in 1927 as in the previous year, chiefly on account of the ease of purchasing special products abroad. In 1928, 300 carloads (about 6,613,800 pounds) were sold in Amsterdam. Several carloads of cigarette and pipe tobacco are reported to have been sold in China, Formosa, and Japan.

COTTON

Since the World War, 43 new textile plants have been put into operation in Hungary. Most of these were cotton mills in small country centers. From 1918 to 1924 the number of spindles had increased five times. It was reported that there were about 93,000 spindles in 1924. During that year 8,240 looms were reported to be in operation. According to Vice Consul Morgan,[34] the National Association of Textile Manufacturers reports the number of cotton spindles as 120,000 and the number of looms as approximately 10,000 in 1926. Production increased considerably during the year, enabling the mills to supply about 50 per cent of the domestic demand, as compared with 44 per cent during the previous year.

The bulk of the cotton employed in the Hungarian textile industry is supplied directly by the United States. (Table 42.)

TABLE 42.—*Cotton, raw, including waste: Imports and exports of Hungary by countries, 1926 and 1927*

[In thousand pounds—i. e., 000 omitted]

Country	1926		1927	
	Imports	Exports	Imports	Exports
United States	10,147		12,697	
Germany	552	77	1,027	301
Austria	515	670	920	912
British India and Straits Settlements	359		1,568	
Czechoslovakia	115	107	285	211
Egypt	95			
Switzerland	82	2	152	
Holland	75			
Brazil	67			
Netherlands	(1)	(1)	73	9
Other countries	33	64	48	39
Total	12,040	920	16,770	1,472

From Statisztikai Havi Közlemények, October–December, 1926, and October–December, 1927.

[1] If any included in other countries.

FODDER PLANTS

The farmers of western Hungary, who were within easy rail and water communication with Vienna and Budapest and who were not far removed from Prague, Munich, and central Europe, were accustomed, before the World War, to buy up lean, grass-fed cattle and other livestock in the eastern part of the old Kingdom and stall feed these animals preparatory to slaughter. They had free access not only to the districts producing the animals to be fed but, also, to districts producing surpluses of feeding stuffs with which to do the

[34] MORGAN, J. H. COTTON SURVEY IN HUNGARY FOR THE 12 MONTHS ENDING JULY 31, 1927. Cons. Rpt. Sept. 10, 1927, 4 p. 1927. [Typewritten copy on file in Bureau of Agricultural Economics Library.]

feeding—corn from Voivodina, Banat, and Crisana, hay from the Seven Mountain region, and potatoes from Slovakia.[35]

When Hungary was set off as a segregated State by the treaty of Trianon, the feeding centers about Budapest and in western Hungary were cut off not only from feeders but also from supplemental feeds. In fact the feed supply for such animals as would normally be carried on the farms of central Hungary was placed in jeopardy. There has been a tendency, even before the World War, to constrict the acreage of natural meadows and pastures and to depend upon cultivated field crops for feeding stuffs. In 1868, meadows and pastures constituted 28.3 per cent of the farm lands of the old Kingdom of Hungary. This proportion had dropped to 25 per cent by 1885; to 22.67 per cent by 1895; and, by 1911, to 21.93 per cent. (*14, p. 17.*)

The percentage of all lands under meadows and pastures in 1911 in the districts comprising present-day Hungary has been estimated at 18.4 per cent. In 1921, out of a total area of 22,921,000 acres, 4,147,000 acres or 18.1 per cent was under meadows and pastures. By 1927, adjustments of boundaries brought the total area up to 22,970,000 acres, but the percentage of meadows and pastures remained unchanged, totaling 4,154,000 acres. (See Table 2.)

It has been suggested that the land reform would probably have a tendency to decrease the area of meadows and pastures because, as is indicated in Table 43, the proportion of grazing lands to total acreage was much less on small peasant holdings than on the large estates.

TABLE 43.—*Percentage of farm acreage in plowland and in pastures in 1895*

Utilization of land	Percentage of farm land classified by—			
	Very small holdings	Small holdings	Middle-sized holdings	Large estates
	Per cent	*Per cent*	*Per cent*	*Per cent*
Plowland	63.6	78.1	57.6	33.3
Pastures	3.2	5.3	12.0	13.6

Die Boden Reform und ihre Wirkung auf die Entwicklung der Ungarischen Landwirtschaft. (*14, p. 18.*)

Between 1921 and 1927 there was no indication of a diminution of meadows and pastures. The meadows and pastures of Hungary in 1923 covered about 18 per cent of the total area of the country, as compared with 18.4 per cent in Czechoslovakia (1925) and 28.2 per cent in Austria (1923). The grazing on the pastures and meadows of Hungary is always problematical and subject to wide fluctuations on account of drought and flood.

It has been necessary to increase the areas under artificial forage crops to maintain the flocks and herds of Hungary at their pre-war level or at the level requisite to the highest possible development of the animal industry.

[35] Volvodina and the western part of Banat are now incorporated in Yugoslavia. The eastern part of Banat, Crisana, and the Seven Mountain region are now parts of the administrative district of Transylvania in Rumania. Slovakia is part of Czechoslovakia.

According to Ludwig Leopold *(9, p. 152)* the area of clover in Hungary in 1926 was 34 per cent above the pre-war normal; that of alfalfa 39 per cent above normal; that of sanfoin 92 per cent; and that of hirsengrass (millet grass) 39 per cent above normal.

The Hungarian peasants value forage plants not only because they supply feed for livestock whose manure is indispensable in maintaining the fertility of the soil but because they understand that such crops as clover improve soil conditions chemically and such crops as roots and potatoes improve them physically. The number of farm animals that Hungary can maintain is limited to the carrying capacity of the meadows and pastures as supplemented by cultivated forage and fodder plants and grains or by the importation of such feeding stuffs. Eastern Hungary is a plains country (the Alföld) and with the improvement of the pastures and meadows could carry considerably more livestock than is now found in this part of the country. However, the improvement in the livestock industry of Hungary may follow the trend begun before the World War and express itself in greater weight and production per animal—in an increase in quality rather than in numbers.

Hungary exported 12,769 short tons of hay in 1927, as compared with 10,078 in 1926. In both years the bulk of the export went to Czechoslovakia and Austria.

TABLE 44.—*Forage and fodder plants: Acreage and production in Hungary, 1924–1927*

Classification	1924		1925		1926		1927	
	Acreage	Production	Acreage	Production	Acreage	Production	Acreage	Production
	Acres	*Short tons*	*Acres*	*Short tons*	*Acres*	*Short tons*	*Acres*	*Short tons*
Forage beets	237,485	1,957,704	254,041	2,849,204	243,994	2,680,892	249,591	2,709,996
Forage beets (mixed crop)	5,436	42,658	5,755	61,256	6,719	66,474	8,426	88,355
Forage pumpkins	15,965	113,033	16,640	172,811	16,279	165,178	16,674	169,442
Sanfoin	88,071	98,492	92,252	117,121	82,685	119,307	84,244	99,211
Alfalfa	459,932	778,059	453,540	804,234	434,118	787,877	422,773	689,709
Alfalfa (mixed crop)	6,395	11,110	6,516	12,176	8,999	16,310	10,213	17,066
Corn fodder	194,095	2,224,084	192,466	2,279,231	193,178	2,005,841	185,790	2,209,065
Moha [1]	61,429	72,137	63,638	86,089	72,269	101,367	72,642	95,197
Winter peas and fodder rye	30,986	45,723	30,907	47,007	27,070	47,339	23,581	38,991
Clover	314,195	431,450	367,499	544,680	364,707	594,060	393,065	559,199
Vetches	113,728	139,639	115,237	142,954	96,915	127,519	99,957	124,429
Vetches and oats	358,162	461,987	383,507	526,308	365,075	526,529	365,029	512,371
Total sown grasses and other forage	1,874,048	6,376,076	1,969,727	7,643,071	1,896,290	7,838,693	1,913,355	7,313,031
Permanent meadows and pastures	4,150,292		4,133,847		4,153,855		4,151,332	

From Internatl. Yearbook Agr. Statis. 1925–26: 48–49; 1926–27: 48–49; 1927–28: 48–49.

[1] A variety of Italian millet.

LIVESTOCK

The scientific breeding and feeding of livestock in the Kingdom of Hungary was almost exclusively an industry developed by the initiative of the large landed proprietors until 1880. The Government offered assistance and encouragement by paying the freight and subsistence of breeding animals en route, by advancing noninterest-bearing loans to breeders, and by giving advice as to breeds and methods. Later, the Government took active steps to foster the animal industry of the Kingdom. In 1894 a law of the rural police instituted a technical section in animal husbandry in the Ministry of Agriculture and undertook to regulate the following: (1) The number of animals to be grazed on village pastures; (2) the adaptation of breeds to each locality; (3) the number of sows bred to a single male; (4) the quality of the male as to breed characteristics. It also issued certificates to owners of sires that were to be employed by the public. Advances in animal industry were more easily effected among the Magyar nobles and peasantry in the counties west of the Danube and on the Alföld, than among the subject peoples: Slovaks, Rumanians, Croats, and others who had been crowded back into the surrounding foothills when the nomadic hordes from the steppes of Russia invaded the upper Danube Basin.

The Avars, the Francs, the Huns, the Slavs, and the Germans during their migrations had each brought their own particular native breeds of livestock with them from western Europe, or Russia or Asia to the Alföld of the Danube, and these had intermingled with the domestic animals of the aboriginal Celts. The Rumanians, during the early centuries of the Christian Era, had acquired several breeds from the Mediterranean Basin and Asia, including water buffaloes from India, so that when the Magyars arrived on their fast ponylike horses, followed more deliberately by their wagon trains of slowly plodding oxen, they found a variety of flocks and herds on the Danube steppes. These primitive breeds of farm animals persisted in Hungary until well toward the close of the last century, and vestiges of them are still to be found in the foothills and mountains of the surrounding succession States. But on the plains now comprised within the frontiers of Hungary the general-purpose low-grade breeds had been rapidly giving place to the purebred specialized strains of livestock introduced from the west.

These changes were accelerated by the direct participation of the Hungarian Government, after 1880, and from then until the outbreak of the World War the systematic upbuilding of the animals found not only on large estates but also on small peasant land holdings in the Comitats now constituting Hungary was more intensely organized, perhaps, than in any other part of Europe. Animal industry rivaled crop production, and the value of the export of live animals, meat, fat sides, hides, and other animal products practically equaled the export value of field-crop products.

In the counties west of the Danube animal husbandry is intensive. Animals are stall-fed, and large areas are cultivated to forage and fodder crops. This is in sharp contrast to the extensive cattle grazing on the plains of the Alföld east of the Danube, where, on account of the lack of moisture or the sterility of the soil (soda soils), whole regions are unsuited to field-crop production. Here

are found large herds of cattle, horses, and sheep, which on the whole afford a source of profit but which suffer severely in dry years.

At the outbreak of the World War the animal industry of Hungary was at its height. Breeders and feeders of the central plain had easy access to the large surpluses of corn produced in Banat and Crisana, now parts of Yugoslavia and Rumania, and to the supplies of hay produced in the Seven Mountain region, now incorporated into Rumania, and to the supplies of potatoes grown in Slovakia.

Hungary is cut off from its former sources of feeding-stuff supplies by the frontiers of three newly formed succession States—Czechoslovakia, Yugoslavia, and Rumania—and is thus handicapped by customs barriers from obtaining feeds to which it had free access before the World War, to supplement the production of the meadows and pastures found in the Alföld.

There were 6,722,000 (*10, p. 8*) acres of meadows and 8,327,000 acres of pastures in the old Kingdom in 1911, as contrasted with 1,706,000 acres of meadows and 2,523,090 acres of pastures within the present boundary of Hungary. There were, on the average, in 1911 throughout the old Kingdom of Hungary 51 sheep, 43 swine, 41 cattle, and 13 horses to each 100 acres of grassland or 1.5 animals per acre. This is in contrast to the conditions in the counties now comprising Hungary, in which in 1911 were found 56 sheep, 76 swine, 47 cattle, and 21 horses per 100 acres of meadows and pastures or an average of 2 animals per acre.

Even before the World War (in 1911), it was not possible to maintain the numbers of livestock found within the Comitats now comprising Hungary without recourse to supplementary feeding on an extensive scale and the purchase of corn, hay, and potatoes in other parts of the former Kingdom. Since the war, although the numbers of livestock has been considerably below the 1911 level and although the areas under forage and fodder plants have been increased, it has been a grave problem to obtain feedingstuffs sufficient to maintain the animals on Hungarian farms in proper condition.

In 1923 there was such a shortage of forage for livestock that the Minister of Agriculture took into serious consideration the question of increasing the area of pasture lands in connection with the land reform. Many farmers were reported to have sold their surlpus cattle to butchers, retaining only such animals as were required for breeding and spring work. The total number of horses, cattle, sheep, and swine carried over at the end of that year was 6,354,000, or about 1.5 per acre of meadows and pastures. A small quantity of corn had to be imported during the year to carry even this number through the summer.

The crop and pasture lands are limited and these in turn limit the numbers of live animals that can be maintained. It is probable that in good years Hungary could produce many more animals than were carried over at the end of 1911. However, on account of the capriciousness of the climate, there would be considerable danger in carrying the maximum number of live animals the country's forage supply would support. The peasant farmer would always be in danger of having to dump his animals upon the market at a possible loss whenever there was a drought or a shortage from any other cause.

The pre-war numbers of livestock in the Comitats now comprising Hungary, as indicated by the census of 1911, had not been reached by the spring of 1928. It must, however, be borne in mind that the census of 1911 included many animals on feed (young stock and lean animals) that were bred in territories outside the boundaries of present Hungary and that had been shipped to the farms about Budapest and near Vienna for finishing before final marketing for slaughter. On the other hand, the 1911 numbers do not represent the maximum number of animals that can be carried on Hungarian farms. If the utilization of forage and fodder can be sufficiently increased these numbers may represent only a fair average about which livestock numbers in Hungary may probably fluctuate. This is more than sufficient for the country's domestic needs and admits of a considerable export of horses, cattle, sheep, hogs, meats, and other animal products to western and northern markets.

In ancient times, no animal was in such high favor in eyes of the Magyars as the horse; later, on account of the high price of wool, the sheep "walked on feet of gold." At the outbreak of the World War, the modern Hungarian farmers kept pace with the Americans and valued their farm animals in the following order: Swine, cattle, horses, and sheep.

Only 15.5 per cent of the swine were found on large holdings of 284.5 acres or more. These large farms specialized in the production of wool and mutton and possessed 71.2 per cent of the sheep. As indicated in Table 6, 552,620 small landowners owned 679,343 horses, averaging more than 1 horse to the farm, as well as 1,200,110 cattle, or more than 2 to the farm. The production of animals and animal products in Hungary was outstandingly an industry of the small farmer.

SWINE

It is probable that the aboriginal dwellers in the Alföld as well as those of the hill country west of the Danube possessed half-wild swine at the time of the advent of the Magyars. It is also probable that the thrifty Magyars brought with them swamp and mountain swine plundered from the villagers of the Carpathians and the lowlands to the east. In any case, two well-defined breeds of hogs were found in Hungary at the beginning of the nineteenth century. One of these called Bakony was found west of the Danube, where hogs were grazed in herds in the oak and beech forests as far west as Styria in Austria and as far south as the Sava River on the Bosnian frontier. The other breed, known as Szalonta, was found on the Alföld east of the Danube as far as the region of Seven Mountains. (See footnote 35.) Both of these breeds were rangy, razorback, meat hogs—late maturing and not very prolific.

The modern swine industry of Hungary dates from 1838, at which time one of the leading Hungarian agriculturists, Prince-Palatin Joseph, brought to his estates in Kisjeno 2 boars and 10 sows of a breed called Angolica (Mangolica)[36] which he obtained from the Topschider domains of the Serbian Prince Milos. This breed was prolific, and the rapidity with which it laid on fat was astounding to the Hungarians. At 1 year of age, boars weighed from 154 to 187

[36] The name suggests that this breed was of Mongolian origin.

pounds and sows 143 to 176 pounds. The Mangolicas were so well adapted to the conditions found in the wooded hills west of the Danube that, 17 years after their introduction into Hungary, the Bakony breed had disappeared. During the next 20 years, Mangolicas had practically replaced the Szalontas on the Alföld east of the Danube.

Such an impetus was given to hog production that between 1857 and 1895 swine numbers in Hungary (not including Croatia and Slavonia) increased from 3,572,000 to 6,447,000. During the next 16 years there was little change, the census of 1911 showing 6,415,000 swine in the old Kingdom.

About half the swine in the old Kingdom were found within the Comitats now comprising Hungary. (Table 45.)

TABLE 45.—*Swine: Trend of numbers on hand in the old Kingdom of Hungary for specified years, 1857–1911, and in Hungary, present boundaries, 1911 and 1920–1928*

Territory	Year	Total swine	Per 1,000 acres [1]	Per 1,000 inhabitants [2]
		Thousands	*Number*	*Number*
Old Kingdom of Hungary (excluding Croatia and Slavonia)	1857	3,572	51.1	[3] 302.0
	1870	3,072	43.9	220.2
	1884	4,804	68.7	334.5
	1895	6,447	92.2	404.4
	1911	6,415	91.8	351.2
Hungary, present boundary	1911	3,213	139.8	422.4
	1920	2,653	115.4	333.9
	1921	2,563	111.5	319.1
	1922	2,473	107.6	305.0
	1923	2,133	92.8	260.5
	1924	2,458	106.9	298.3
	1925	2,633	114.6	314.6
	1926	2,520	109.6	298.4
	1927	2,387	103.9	280.2
	1928	2,562	115.8	309.7

1857, from Le Porc en Hongrie 1900: 45.
1870–1911, from Magyar Statisztikai Évkön. 1872: 120; 1900: 100; 1913: 96.
1911, new boundaries calculated from Magyar Statisztikai Évkön. 1912: 131, 137.
1920, furnished by the Royal Hungarian Ministry of Agriculture.
1921, estimated by interpolating the decrease between 1920 and 1922.
1922–1926, from Magyar Statisztikai Szemle, May–June, 1925, January, 1926, and January, 1927.
1927, from Internatl. Crop Rpt. and Agr. Statis., November, 1927, (n. s.) 18: 614.
1928, from report of Vice Consul J. H. Morgan, Oct. 24, 1928, Budapest.

[1] Pre-war area = 60,898,000 acres from Magyar Statisztikai Évkön. 1913: 11, and post-war area = 22,983,000 acres from Statesman's Yearbook, 1926.

[2] Populations = 1870, 13,579,129 from Statis. Jahrb. Ungar. 1873: 22.
1884, 14,363,012 from Statis. Jahrb. Ungar. 1884: 5.
1895, 15,940,327 from Magyar Statisztikai Évkön. 1895: 65.
1910, 18,264,533 from Magyar Statisztikai Évkön. 1912: 19.
1910–1928, new boundaries, see Table 8.

[3] From Le Porc en Hongrie 1900: 45.

Before the World War, 90.2 per cent of the swine in the Comitats now comprising Hungary were Mangolicas. Out of a total of 3,213,000 hogs in 1911 only 314,000, or 9.8 per cent were Yorkshires or other western-European breeds of the bacon type. Aboriginal types of hogs are not to be found in Hungary, although such primitive types still persist in the highlands of Austria, Czechoslovakia, Rumania, Bulgaria, and south Yugoslavia.

The production of pork and lard in Hungary is of special interest to the farmers of the United States because of the competition of these products with American pork and pork products on the markets of central Europe.

FEEDING AND MARKETING

The swine owned by small farmers run around the farmyards and act as scavangers. The 552,620 owners possessing farms up to 284.4 acres held 1,819,921 swine in 1911, or an average of 3 to 4 hogs each. (Table 6.) When grain is cheap the peasant turns his cereals into pork, and markets his produce in this form. When pork is cheap or cereals dear, the peasant lets his swine shift for themselves and markets his product in very lean condition. There is thus no uniformity in the character of hogs produced by the peasants under such conditions, and for this reason there is great variation in size and quality from year to year and from household to household.

In 1911 there were 273,880 landless owners of swine who maintained 896,075 hogs. Most of these owners were householders who fed 1 or 2 hogs for home use, but many owned small establishments for fattening pigs with purchased feed. Most of these establishments were in the vicinity of Budapest or in western Hungary between Budapest and Vienna or Prague. But there were several large establishments that handled thousands of hogs each year.

The commercial fattening of swine in the Comitats now comprising Hungary is an ancient industry. During the early years of the eighteenth century, the Serbs drove large herds of swine on foot along well-defined trails through the woods west of the Danube in the direction of Vienna, selling a few here and a few there along the route. They also brought hogs in boats up the Danube. The animals not sold in Hungary eventually found their way into Styria, lower Austria, Bohemia, or even as far up the Danube as Bavaria.

The cultivation of Indian corn during this century increased rapidly, particularly in the lowlands of the Alföld in the southeast, where pork production on a commercial scale was firmly established at the beginning of the nineteenth century. The Serbs, who also produced corn in great quantities and who had swine of superior quality, were practically the sole competitors of the Hungarians until the middle of the last century. At that time, pork and lard from the United States began to appear upon the German markets to the detriment of the corn and hog farmers in both Serbia and Hungary.

From 1870 to 1890, the main business of pork production was conducted at Köbánya, a large establishment near Budapest where, during 1890, more than 640,000 hogs were on feed. Another important establishment was located at Györ, on the Danube between Budapest and Vienna. This establishment was equipped to handle more than 40,000 hogs. During the next 10 years, 8 other establishments, equipped to fatten from 15,000 to 40,000 hogs each came into prominence, and the significance of Köbánya diminished so that by 1900 only 170,000 hogs were under feed at this plant.

Köbánya handled about 90,000 native hogs and 80,000 Serbian hogs in 1900, Rumania having dropped out as a source of lean swine. When the Austria-Hungarian agricultural protective tariff went into effect in 1906, Serbia was shut out of the Hungarian market, and from then on Köbánya handled only native stock. After the loss of Serbian lean swine Köbánya was unable to obtain sufficient native hogs and until the outbreak of the World War the number of hogs handled during any one year never exceeded 92,300 (Table 46), although the total number of swine commercially slaughtered or exported from the old Kingdom of Hungary during 1909–1913 averaged about 2,191,000.

TABLE 46.—*Swine: Numbers received at the feeding institution in Kőbánya from specified countries, 1870, 1880, 1890, and 1900–1913*

Year	Hungary	Serbia	Rumania (old Kingdom)	Galicia	Total
	Number	*Number*	*Number*	*Number*	*Number*
1870	318,700	216,160	54,000		588,860
1880	416,440	32,050	26,573		473,063
1890	502,764	336,787	1,879		841,430
1900	87,977	82,295			170,272
1901	88,210	108,306			196,516
1902	81,398	148,857			230,255
1903	62,060	133,985			196,054
1904	48,943	151,929			200,852
1905	64,124	114,020			178,144
1906	81,083	162,181			143,189
1907	85,702				83,702
1908	89,000				89,000
1909	90,732				90,732
1910	86,957				86,957
1911	67,700			350	68,050
1912	88,374				88,374
1913	92,272				92,272

1870–1890 from Le Pore en Hongrie 1900: 84.

1900–1913, from Magyar Statisztikai Évkönyv, 1900 to 1908 and 1913.

[1] 7 months only. There were no shipments of hogs from Serbia to Hungary after July, 1906, at which time the agricultural protective tariff of the Austro-Hungarian Monarchy went into effect. The bitter feeling engendered in Serbia at the abrupt exclusion of Serbian hogs from the Austria-Hungarian markets continued until the World War.

During the 5-year period ended in 1913, the slaughterhouses of the old Kingdom of Hungary including Croatia and Slavonia dressed an average of 1,597,586 hogs, in addition to which 593,635[37] live hogs were shipped abroad each year. The yearly commercial turnover of hogs before the World War thus averaged about 2,191,000 head or about 29 per cent of the numbers of swine reported on Hungarian farms including Croatia and Slavonia in 1911. This does not include animals slaughtered for home use, of which there is no record.

Before the World War the hog-feeding industry was concentrated in two general districts: (1) In the counties of west Hungary between the Danube and the Austrian frontier, and (2) in the southeastern corn belt comprising eastern Croatia and Slavonia and Voivodina (now in Yugoslavia), and Banat and Crisana (now parts of Rumania). Since the war, it has been difficult for the commercial feeding establishments to obtain lean hogs from their former sources of supply, from which they have been shut off by Rumanian and Yugoslavian customs barriers. The Comitats comprising Hungary were dependent upon former outlying districts not only for lean hogs but for corn and other feeds as well. Free trade in the former markets of Vienna, Prague, and many other cities to the west and north is a thing of the past. Sales of hogs and pork products in the Provinces now comprising Austria and Czechoslovakia are hampered by tariff restrictions and questions of the fluctuating value of the currencies of these countries. Therefore, it will be very difficult, if indeed it is possible, for the former swine-fattening industry of Hungary to be reestablished upon a plane of its pre-war magnitude.

[37] During this period Austrian records show that 438,158 live hogs received at Vienna originated in Hungary and Croatia-Slavonia. Galicia, now a part of Poland, shipped 373,439 hogs to Vienna each year during these 5 years.

In 1920 there were 2,653,000 swine in Hungary, as compared with 3,213,000 in 1911, a decrease of 560,000 head. But a large part of this decrease is accounted for by the fact that there were not such large numbers of swine from the east and southeast in the feed lots about Budapest and west of the Danube as has been normally the case before the World War. The 1920 census figures represent more nearly the swine bred and raised within Hungary than do those of 1911.

During the next three years swine numbers decreased, reaching their postwar minimum of 2,133,000 in 1923. During 1922 and 1923, not enough corn was produced in Hungary to carry the livestock of the country through these two seasons, and 220,000 bushels had to be imported in 1922 and 78,000 bushels in 1923.

In 1924 and 1925, corn production increased to 72,635,000 and 86,496,000 (net) bushels respectively. Swine numbers similarly increased to 2,458,000 in 1924 and to 2,633,000 in 1925. The following year, corn production fell off to 75,074,000 bushels (net), and the number of swine decreased to 2,520,000. In 1927, there was a further decrease in corn to 66,870,000 bushels, accompanied by a decrease in swine to 2,387,000.

There is a general relation between the numbers of hogs carried on farms in Hungary and the production of corn, and the decrease in the corn crop in 1926 was accompanied by heavier marketing of hogs. (Table 47.)

TABLE 47.—*Hogs sold in Budapest, 1924–1927*

Year	Sold in open market	Other reported sales	Total
	Number	*Number*	*Number*
1924	199, 423	28, 870	228, 293
1925	345, 358	37, 239	385, 597
1926	532, 691	[1] 52, 771	[1] 585, 462
1927	421, 574	23, 450	445, 024

Ludwig Leopold (9), Commerce and industry of Hungary in the year 1927 (8).

[1] Estimated.

In the beginning of 1926 more and more hogs were placed on feed at commercial establishments in the hope of the development of trade with Germany. Corn of the 1925 crop was cheap at first; but, during the season, it became evident that the 1926 crop would be short, and prices rose sharply while the hogs were still on feed. In the meantime the price of fat hogs fell below the price the farmers were asking for lean pigs.

The packing houses of Czechoslovakia took advantage of this situation and bought up 40,427 hogs weighing over 154 pounds each from the estates of Hungarian nobles for conversion into hams and bacon. Austria took 105,579 heavy hogs, and 30 went to other countries.

Hungary exported 753 suckling pigs to Austria in 1926 and 15 to Yugoslavia. A total of 10,890 pigs weighing from 66 to 154 pounds was exported to various countries, as follows: Austria, 9,564; Czechoslovakia, 1,208; Yugoslavia, 105; and Rumania, 13.

The total export for 1926 was 157,694, as compared with 893,192 exported from the old Kingdom of Hungary in 1913. (Table 48.)

TABLE 48.—*Swine: Exports from the old Kingdom of Hungary by principal countries, 1906–1913, and from Hungary, present boundary, 1921–1927*

Year	Austria	Germany	Switzerland	Italy	Czechoslovakia	Other countries	Total
Old Kingdom:	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*
1906	424,122	244	653	10	(1)	130	425,159
1907	378,354	114	5,344	8,624	(1)	33	392,469
1908	482,740	1,446	3,156	17,126	(1)	81	504,529
1909	669,827	863	798	3,034	(1)	59	674,581
1910	550,298	45	164	255	(1)	120	550,882
1911	300,559	16	800	289	(1)	149	301,813
1912	546,071	141	461	895	(1)	139	547,707
1913	891,066	447	379	1,213	(1)	87	893,192
Hungary, present boundary:							
1921	9,751	730				89	10,570
1922	40,957	0,643			10,820	182	70,602
1923	22,904	511			27,702	1	51,208
1924	30,113	3,547			11,373	983	46,016
1925	81,350	.1			24,602	3,547	109,500
1926	115,893				41,635	163	157,694
1927	59,701				55,050	1,756	116,507

1906–1913 total exports from Hungary from Magyar Statisztikai Évkön. 1909: 206; 1912: 227; and 1923: 154.

1906–1913 exports from Austria-Hungary from Statis. Auswärtigen Handels des Vertragszollgebrets der Beiden Staaten der Österr-Ungar Monarchie 1906–1913.

1906–1913 exports from Hungary were larger than those from the dual monarchy, so the difference is assumed to be exported to Austria from Hungary.

1921–1926 from Statisztikai Havi Közlemények, October-December, 1921–1926.

1927 Commerce and industry of Hungary in the year 1927 (*8, p. 118*).

[1] Czechoslovakia was part of Austria-Hungary prior to the World War.

The situation in the hog-feeding industry, which was critical in 1926, became alarming in 1927 in view of the shortage of the 1927 corn crop, which necessitated the import of corn toward the end of the year. The cost of feeding hogs in Hungary was relatively higher than in Rumania and even in Yugoslavia, although there was also a corn shortage in the latter country. The competition of Rumania was strengthened by the abolition of the export fee which had hampered the hog industry of that kingdom in former years. The hog industry of Hungary is suffering from the after effects of the prohibition that was placed upon the export of pork and pork products immediately following the World War and the succeeding system of export permits. During this period, lard and bacon from the United States gained possession of the markets of Austria and Czechoslovakia, and since 1924 it has been extremely difficult for Hungary to combat this competition.

INTERNATIONAL TRADE IN SWINE

Austria, particularly Vienna, is the primary market for the surplus hogs produced in Hungary. Czechoslovakia, on account of the ham and bacon factories in Prague, ranks second. The Austrian and Czechoslovak duty tariffs are so made as to favor the imports of live swine and to hinder the import of bacon, lard, and other pork products. The export of hogs declined sharply in 1927, decreasing to 116,507 as compared with the postwar maximum of 157,694 in 1926. Of the hogs exported in 1927, 59,701 went to Austria, 55,050 to Czechoslovakia, 109 to Yugoslavia, and 104 to Rumania. In addition to hogs, 1,543 pigs weighing up to 30 kilograms (66 pounds) apiece were shipped to Austria and other countries. This decline in hog exports is important to Hungary because Rumanian, Polish, and Yugoslavian competitors have gained ground in the northwestern markets.

Hungary imported 691 hogs from Germany and Yugoslavia, which were to be employed, for the most part, as breeding animals.

FATS AND BACON

Hungary felt the competition of the United States in fats and bacon very keenly during 1926 and could successfully compete only on those markets where consumers were prejudiced in favor of the Hungarian products and were willing to pay higher prices than those asked for the American products.

The export of smoked bacon was restricted because many localities that had purchased Hungarian bacon in former years had equipped themselves during the World War for curing their own pork. The export of lard was facilitated during the year by making up packages of 25 kilograms (55 pounds) each. This is reported to have made selling in foreign markets easier.

The total export of pork and pork products in 1927 fell to 20,147,000 pounds, as compared with 38,131,000 pounds in 1926. This situation is all the more unsatisfactory because Hungarian lard had enjoyed an excellent reputation for many decades.

Lard exports to various countries in 1927 were as follows: To Czechoslovakia, 7,122,000 pounds as compared with 16,370,000 pounds in 1926; to Austria, 2,019,000 pounds as compared with 5,488,000 pounds; to Germany, 538,000 pounds as compared with 757,000 pounds; and to other countries, 253,000 pounds as compared with 29,000 pounds.

The following exports of salt fat sides were made to various countries: Czechoslovakia, 6,550,000 pounds in 1927 as compared with 9,967,000 pounds in 1926; Germany, 563,000 pounds as compared with 2,437,000 pounds; Poland, 1,029,000 pounds as compared with 348,000 pounds; Austria, 151,000 pounds in 1927 as compared with 511,000 pounds to Austria, Italy, and France in 1926.

There were 345,000 pounds of smoked bacon shipped to Austria and Czechoslovakia in 1927 as compared with 305,000 pounds in 1926; 5,000 pounds to Germany, as compared with 24,000 pounds in 1926; whereas other countries took 11,000 pounds in 1927 as compared with 4,000 pounds shipped in 1926.

Hungary exported 1,561,000 pounds of salame sausage in 1927, as compared with 1,891,000 pounds in 1926. Austria absorbed 1,268,000 pounds of the 1927 export.

CATTLE

As in most European countries, the mainstay in farm power in Hungary is the ox; but with the view of building up a dual-purpose industry, milk production as well as work, cattle were introduced from Switzerland and other countries of western Europe. These breeds had, by 1913, crowded most of the native gray steppe cattle back across the Danube and were found in large numbers in the eastern part of the Alföld.

This improvement in the cattle had a stimulating influence upon horse breeding. There are perhaps no better draft oxen in the world than the rangy gray steppe cattle; the steers of dairy breeds are not so well adapted to the plow. Consequently almost every-

where in Hungary it has been necessary to augment the traction power of a yoke of oxen of these dairy breeds by hitching a horse to the plow or load when any particularly heavy work was in hand. As in north Bulgaria, so also in western Hungary, the use of cattle in farm work has given place more and more to horses.

The silver-gray cattle of Hungary are descended from the steppe cattle of Asia and Russia and so are particularly well adapted to the extreme heat and droughts of summer and the rigors of the severe winters experienced upon the great Hungarian plain. These animals are closely related to the Podolian gray cattle of Rumania and southern Russia and probably account for part of the ancestry of the gray cattle of Yugoslavia. They are large boned and rangy, heavy in the forequarters and slight behind, being particularly well adapted to work at the plow under severest conditions, and as J. V. Pirkner (*12*) states: "After 8 to 10 years of uninterrupted labor they can always be fattened for slaughter."

The gray steppe cattle give little milk; their primary function is that of traction animals. For this reason, among the Rumanian and Serbian populations of the old Kingdom of Hungary, cows were yoked into the teams with oxen so that in 1911 fully 530,000 cows were classed as work animals. The Magyar peasants, on the other hand, seldom work their cows in the field, chiefly because they had substituted dairy breeds of cattle for the single-purpose steppe animals, which for 30 years before the World War had occupied a diminishing place of importance among Hungarian herds. In 1884, fully 80.2 per cent of all cattle in the old Kingdom of Hungary were gray Hungarian, Podolian, or similar primitive breeds. In 1895 the percentage had decreased to 65.9; in 1905, to 51.6 per cent; and in 1911, to 31.1 per cent. In 1926, there were only 16.6 per cent of these cattle to be found among the herds of Hungary.

The place of the gray steppe cattle is being taken by the red-mottled dairy cattle of Triburg and the brown Simmenthals and gray Swiss from Switzerland and western Austria.

The numbers of cattle in Hungary had fallen 60,000 below the pre-war average, by 1920. (Table 49.) For the next three years, cattle continued to decrease, reaching the low point of 1,819,000 in 1923 as compared with 2,001,000 before the World War. During the following two years, cattle numbers increased to 1,920,000 or nearly to the 1920 level, but by 1927 fell to 1,805,000, the lowest point since the World War.

TABLE 49.—*Cattle, including water buffaloes: Numbers in the old Kingdom of Hungary for specified years and in Hungary, present boundary, 1911 and 1920–1928*

Territory	Year	Total cattle	Per 1,000 acres [1]	Per 1,000 inhabitants [2]
		Thousands	*Number*	*Number*
Old Kingdom of Hungary, excluding Croatia and Slavonia	1870	3,569	51.1	262.8
	1884	4,879	69.8	339.7
	1895	5,830	83.4	365.7
	1911	6,184	88.5	336.2
Hungary, present boundary	1911	2,001	87.1	261.2
	1920	1,941	84.5	243.2
	1921	1,884	82.0	233.6
	1922	1,823	79.5	224.5
	1923	1,819	79.1	221.3
	1924	1,896	82.5	229.1
	1925	1,920	83.5	229.4
	1926	1,847	80.4	218.7
	1927	1,805	78.5	211.9
	1928	1,812	78.8	210.8

1870–1911 from Magyar Statisztikai Évkön. 1872: 120; 1900: 100; and 1913: 96.
1911 new boundaries calculated from same source 1912: 131, 137.
1920 furnished by the Royal Hungarian Ministry of Agriculture.
1921 estimated by interpolating the decrease between 1920 and 1922.
1922–1926 from Magyar Statisztikai Szemle, May–June 1925, January 1926–27
1927 from Internatl. Crop Rpt. and Agr. Statis. (n. s.) 18: 614.
1928 from report of Vice Consul J. H. Morgan, October 24, 1928, Budapest.

[1] For areas pre-war and post-war see footnote 1, Table 45.
[2] For populations 1870–1928 see Tables 8 and 45.

INTERNATIONAL TRADE IN CATTLE

During the 5-year period ended 1913, the old Kingdom of Hungary, including Croatia and Slavonia, shipped to Austria (that is, to the Vienna market) an annual average of 186,760 mature cattle or 68.7 per cent of the beef animals slaughtered in the capital of the former Empire. In addition, 531,182 mature cattle and 211,946 young stock were slaughtered at Budapest and at country centers. This indicates an annual commercial turnover of 929,888 cattle.

An annual average of 634,782 pounds of beef slaughtered in Hungary was shipped to Vienna each year. During this period, Hungary sent to Vienna 24,083 calves and 40,331 pounds of veal. The number of calves slaughtered in Budapest and country centers averaged 574,916 heads each year. An average of 1,553 calves were shipped yearly from Vienna to Hungarian points.

The cattle trade of Hungary can not be compared with that of the old Kingdom during pre-war days. The only point of similarity is that most of the export goes to Austria.

Hungary exported 73,835 cattle of all classes, in 1927, as compared with 91,074 in 1926. Cattle production, as reflected by these international-trade figures, is in the most critical position of any branch of the animal industry. Recovery of cattle numbers in Hungary is retarded by several factors: (1) Reparations payments; (2) the high price of fodder and the high cost of fodder production; (3) more careful selection of individual animals, particularly dairy cows; (4) replacement of oxen by horses in farm work; (5) weakened purchasing capacity of customer countries; and (6) decreased domestic consumption of and, consequently, decreased demand for beef. All these factors have tended to retard production and to decrease the numbers of cattle available for export.

In 1927 Austria was the chief purchaser of Hungarian cattle, absorbing 49,913. Italy took 13,549; Switzerland, 7,975; Czechoslovakia, 2,306; whereas other specified countries took 50 head and the destination of 42 head was not specified.

Hungary imported 1,003 cattle in 1926, of which 165 were purebred stock, chiefly from Switzerland and Holland. The 1927 imports of 2,302 head were not classified.

BEEF PRODUCTION

The number of cattle driven into the Budapest cattle market was reported to be 50,687 in 1927, as compared with 54,810 in 1926. Average weights, except in the case of water buffaloes, were greater than during the previous year. Pasturage is too restricted and the cost of fodder too high in Hungary to render it feasible to raise cattle without obtaining an income from milk or work in addition to the meat produced.

A relatively small number of animals are fattened at distilleries, the breweries, and at sugar factories. Some of the peasants and large landowners stall-feed a few animals each year; but the majority of cows and steers are marketed in whatever condition they happen to be in when they are discarded from the plow or the dairy.

There is no breed of cattle in Hungary specifically adapted to meat production. In the first place, there is little demand for prime beef in the American sense. The peasantry eat very little beef, and the standard of living in the cities is much lower than in western Europe. Steaks are seldom if ever used in the native households. Beef is ground up and mixed with bread crumbs and fried in little pattes called coutlettes, or it is cut up into small morsels and stewed with vegetables in the highly seasoned concoction called goulash. More rarely it is roasted. Fried or broiled beef is restricted usually to the fillet, which is removed from the carcass and sold separately. The greater portion of the beef animal is classed as soup meat, which is boiled both with and without vegetables.

DAIRYING

The old Kingdom of Hungary exported to the former Empire of Austria an average of 147,176,000 pounds of milk, 6,633,000 pounds of butter, and 4,635,000 pounds of cheese during the 5-year period 1909–1913. The greater part of these products was shipped from the western comitats of present Hungary between the Danube River and the Austrian frontier, where the cattle are almost exclusively of the Swiss dairy type.

There were 541 dairy associations that reported in 1909 in the old Kingdom of Hungary. Of this number, 328 societies, located in the districts west of the Danube River, reported 54,398 cows, from which 104,991,800 pounds of milk were delivered to the plants. The associations manufactured 3,450,199 pounds of butter. There is no record of the quantities of milk used at home or of transactions in liquid milk.

There were 72 societies that reported 12,247 cows producing 16,589,000 pounds of commercial milk and 688,000 pounds of butter

in the Seven Mountain region, which is now part of the administrative district of Transylvania, in greater Rumania.

At the time of the census enumeration in 1911, there were 921,000 cows in the comitats now comprising Hungary. Doctor Leopold (*9, p. 211*), in commenting on the situation in 1926, placed the number of cows at 900,000. Since the World War, special attention has been given to improving the quality of the cows held on Hungarian farms. Between November 1, 1925, and October 31, 1926, a controlled test of production was made with 420 cows in different parts of Hungary. The cows under test weighed from 1,069 to 1,437 pounds each. The average lactation period was 308 days. The highest group, comprising 39 cows, averaged 9,354 pounds of milk, equivalent to 344 pounds of butterfat, each. The lowest group comprised 62 cows and averaged 7,145 pounds of milk, equivalent to 258 pounds of butterfat. One of the animals tested was the famous Augusta 26, with a record of 28,014 pounds of milk, equivalent to 1,692 pounds of butterfat.

Budapest is the leading market for liquid milk and other dairy products. The daily officially inspected milk supply of Budapest in 1925 was 551,000 pounds, of which 30 per cent was supplied by small peasant farms and 70 per cent by large-estate owners. It is estimated that fully 110,000 pounds of milk produced by uninspected cows is sold illegally in Budapest each day. In 1926, Budapest milk consumption officially had increased to 251,404,000 pounds, or 689,000 pounds each day.

The milk situation in 1927 was characterized by an overproduction which appeared suddenly, increasing the milk supply 30 to 40 per cent above that of 1926, with no compensating increase in the possibilities of sales. Throughout the year the Budapest dairies worked with a surplus varying from 68,000 to 227,000 pounds per day above that which they had been accustomed to handle. There was a small increase in consumption of milk in Budapest during the year. The officially reported sales for 1927 have been placed at 268,191,000 pounds, or 735,000 pounds per day, an increase of 2 per cent over the sales reported the previous year (*15*). It is estimated that the average consumption of milk rose to 0.3 quart per person per day and that home consumption of butter and cheese also showed a tendency to increase. The turnover tax, which burdened the milk industry, was abolished on August 8, 1927, and the price of milk was cheapened, and consumption was, accordingly, stimulated. Nevertheless, there were 551,000 pounds of butter and 1,300,000 to 1,500,000 pounds of curds in cold storage in Budapest at the end of the year. In the opinion of experts, the tendency is toward increased production (*8*).

Development of the dairy industry in Hungary depends upon the feeding-stuff supply which is precarious under the climatic conditions of the great plain (Alföld). Great improvement could be made though better selection of high-producing cows. It is probable that the reduction in numbers of cattle (Table 49) has been partially compensated for by the higher quality of the animals retained.

INTERNATIONAL TRADE IN DAIRY PRODUCTS

In 1926, Hungary exported 6,946,033 pounds of liquid milk, as compared with 10,387,634 pounds in 1925. The 1926 export went

chiefly to Austria (6,900,339 pounds), and 38,580 pounds went to Czechoslovakia. Imports, in 1926, were 2,474,223 pounds, as compared with 2,376,559 the previous year. Of this quantity, 2,438,729 pounds came from Czechoslovakia in 1926, as compared with 2,235,244 pounds in 1925.

Hungary exported 441,000 pounds of butter in 1927, as compared with 71,000 pounds in 1926 and 233,000 pounds in 1925. In the summer of 1927 a small amount of butter was imported, probably because of lack of uniformity in production and storage. In 1926, imports of butter, chiefly from Denmark, reached 463,000 pounds, as compared with 437,000 in 1925.

There was no appreciable import of cheese in 1927, and no export. In 1926, Hungary exported 9,000 pounds of hard cheese and 411,000 pounds of soft cheese, for the most part to Austria. The imports of hard cheese (560,000 pounds) and 275,000 pounds of soft cheese were chiefly from Switzerland.

HORSES

The breeding and handling of horses among the Magyars was the special prerogative of the head of the household, whereas, the care of cattle, swine, and sheep among the peasants was left more to the women, old men, and children. The reason for this was that the horse was part of the fighting equipment of the Magyar warrior, and he was responsible to his chieftan for its condition and breed characteristics of speed and endurance. The support of the family devolved upon the nonwarriors. Although somewhat modified by the passing of time, the custom has still persisted in many localities.

The foundation stock of the Hungarian horse-breeding industry is the same small Asiatic breed, scarcely larger than a pony, that carried the hordes of Attila across Russia and swept westward across central Europe to the Rhine in an unbelievably short time. These staunch animals that, as stated by Johann V. Pirkner, "besides the rider often bore a fat ram or even a nobler, two-legged booty thrown across the saddle" are the basis for the world-famous Hungarian horses of modern times. The characteristics of both horse and peasant in Hungary have clung tenaciously to the past. The horses are resistant to extremes of heat and cold and to hard usage. The peasants are unusually loyal to their leaders and have cooperated with the State in improving their horses. In addition to the native Hungarian breed of horse, which varies somewhat with the locality, excellent examples of all the best European and Arabian breeds, are found in Government stables and on large estates.[38]

[38] In 1911 the Government breeding stables reported 187 English thoroughbreds, 1,502 English half bloods 41 Arabian full bloods, 293 Arabian half bloods, 614 Nonius, 203 Gidran, 176 Lipitza, and 142 Norik.

TABLE 50.—*Horses: Numbers in the old Kingdom of Hungary for specified years, and in Hungary, present boundary, 1911 and 1920–1928*

Territory	Year	Horses	Per 1,000 acres [1]	Per 1,000 inhabitants [2]
		Thousands	*Number*	*Number*
Old Kingdom of Hungary, excluding Croatia and Slavonia	1870	2,631	23.3	120.1
	1884	1,749	25.0	121.8
	1895	1,907	26.6	125.3
	1911	1,974	28.2	107.3
Hungary, present boundary	1911	876	38.1	114.4
	1920	685	29.8	85.8
	1921	701	30.5	86.9
	1922	717	31.2	88.1
	1923	815	35.5	99.1
	1924	850	37.0	102.7
	1925	876	38.1	104.7
	1926	895	38.5	106.8
	1927	903	39.3	106.0
	1928	918	39.9	106.8

1870–1911 from Magyar Statisztikai Évkön. 1873: 120; 1900: 100; and 1913: 96.
1911 new boundaries calculated from same source 1912 p. 131 and 137.
1920 furnished by the Royal Hungarian Ministry of Agriculture.
1921 estimated by interpolating the increase between 1920 and 1922.
1922–1926 from Magyar Statisztikai Szemle May–June, 1925; January, 1926–27.
1927 from Internatl. Crop Rpt. and Agr. Statis. (n. s.) 18:014.
1928 from report of Vice Consul J. H. Morgan, Oct. 24, 1928; Budapest.

[1] For areas see footnote 1, Table 45.
[2] For populations 1870–1928 see Tables 8 and 45.

Hungarian horses are almost universally of the warm-blooded breeds and although well suited to cavalry and other military purposes are nevertheless adapted to light farm work. In Hungary, as in Rumania, Yugoslavia, and Bulgaria, the primary source of farm power is the ox. In recent years, the quality of the oxen has been decreasing, and everywhere horses have been hitched to the plow to supplement the ox team. Although the average weight of horses in Hungary is light, they are being used more and more for farm work. There is need of a heavier draft horse in Hungary and the attention of breeders is being turned in this direction.

In 1911 there were 876,000 horses in the Comitats now comprising Hungary. (Table 50.) The inroads made on Hungarian livestock during the World War decimated the numbers of horses in the country. In 1920 there were 191,000 fewer horses than before the war. During the Rumanian invasion many horses were sequestered permanently. Since 1920 considerable numbers of horses have been sent to Yugoslavia and Czechoslovakia in payment of reparations. In spite of these drafts upon the nation's resources, the numbers of horses on Hungarian farms have increased to such an extent that by 1925 they had reached the 1911 estimated number, and in 1928 were 42,000 above that estimate.

INTERNATIONAL TRADE IN HORSES

During 1927, Hungary exported 1,011 colts, as compared with 765 in 1926, most of which went to Austria. The number of horses more than 2 years old shipped to Austria, in 1927, was 15,315, as compared with 18,330 in 1926. Shipments to various other countries were as follows: To Czechoslovakia, 4,034 in 1927, as compared with 4,208 in 1926; to Italy, 3,760, as compared with 4,981 in 1926; to Switzerland, 1,384, as compared with 691 in 1926; to Rumania, 868, as compared with 464; to Turkey, 486, as compared with 204 in 1926; to Yugoslavia, 54, as compared with 64 in 1926; to Union of Socialistic Soviet

Republics, 2,947; and to other countries 51 in 1927, as compared with 109 in 1926.

Horse breeding and the export of horses are capable of development, and the data of Table 50 indicate that this branch of the animal industry of Hungary is receiving closer attention than is any other.

SHEEP AND GOATS

As in other European countries, the sheep industry of the old Kingdom of Hungary had been on the decline since 1870. The low point was reached in 1895. After that year, there was a slight recovery. The census of 1911 showed 7,698,000, of which number, 2,354,000 sheep were found in the Comitats comprising residual Hungary.

The most usual breed of sheep in Hungary is the Spanish merino, introduced by Queen Maria Theresia and Kaiser Joseph II. There were 1,546,000 merinos or crosses containing merino blood in 1911 in the Comitats constituting residual Hungary or about 65.7 per cent of total number.

The native milk sheep bearing long, coarse wool numbered 521,000 or 22.1 per cent of total number, before the World War. The most common of these long-wool sheep was the Raczka breed, which was brought by the Magyars from the north Ural regions in Asia, and which exhibit characteristics that are the result of thousands of years of breeding without intermixture from other breeds. Another long-wool, milk sheep is the Czigaja that probably found its way to the Hungarian plains from Rumania and South Russia, but this or a similar breed may have been in possession of the Celtic aborigines before the arrival of the Magyars.

English and other mutton types made up the remaining 12.2 per cent.

In 1920 there were only 1,339,000 sheep in Hungary. There had been an appreciable increase in the number of sheep between 1920 and 1925, in which year 1,891,000 were reported. The next year, 1926, there was a decrease in the number, which continued through 1927 to the spring of 1928, when 1,566,000 sheep were reported on Hungarian farms. (Table 51.)

TABLE 51.—*Sheep: Number in the old Kingdom of Hungary for specified years and in Hungary, present boundary, 1911 and 1920–1928*

Territory	Year	Total sheep	Per 1,000 acres [1]	Per 1,000 inhabitants [2]
		Thousands	*Number*	*Number*
Old Kingdom of Hungary, excluding Croatia and Slavonia	1870	11,920	170.5	877.8
	1884	10,595	151.6	737.7
	1895	7,527	107.7	472.2
	1911	7,698	110.1	418.5
Hungary, present boundary	1911	2,354	102.4	307.3
	1920	1,339	58.3	167.8
	1921	1,346	58.6	166.9
	1922	1,352	58.8	166.1
	1923	1,587	69.1	193.0
	1924	1,814	78.9	219.2
	1925	1,891	82.3	226.0
	1926	1,804	78.5	213.6
	1927	1,611	70.1	189.1
	1928	1,566	68.1	182.2

1870–1911 from Magyar Statisztikai Évkön. 1872: 120; 1900: 100; 1913: 96.
1911 new boundaries calculated from same source 1912: 131, 137.
1920 furnished by the Royal Hungarian Ministry of Agriculture.
1921 estimated by interpolating the increase between 1920 and 1922.
1922–1926 from Magyar Statisztikai Szemle, May-June, 1925, January, 1926–27.
1927 from Internatl. Crop Rpt. and Agr. Statis. (n. s.) 16: 614.
1928 from report of Vice Consul, J. H. Morgan, Oct., 1928, Budapest.

[1] For areas see footnote 1, Table 45. [2] For populations, 1870–1928, see Tables 8 and 45.

There were 34,964 goats in Hungary before the World War. During the unsettled conditions following the war numbers tended to increase, until in 1925 there were 59,831 goats in the country. With improvement in conditions goat numbers have tended to decrease and in 1928 had reached the low point of 29,836. (Table 52.) It is probable that goats (as well as mules and donkeys) will not be important factors in the agriculture of Hungary.

TABLE 52.—*Goats, mules, and donkeys: Number in present Hungary, 1911 and 1922–1928*

Year	Goats	Mules	Donkeys
	Number	*Number*	*Number*
Pre-war year: 1911	34,964	413	7,879
Post-war years:[1]			
1922	48,241	2,232	5,386
1923	55,016	1,991	5,013
1924	55,400	1,963	4,907
1925	59,831	1,787	5,039
1926	48,633	1,747	4,954
1927	36,418	1,657	4,784
1928	29,836	(2)	(2)

1911, calculated from Magyar Statisztikai Évkön. 1912: 126, 137.
1922–1926 from Magyar Statisztikai Szemle, May-June, 1925, January, 1926, and January, 1927.
1927 from Internatl. Crop Rpt. and Agr. Statis. (n. s.) 18: 674.
1928 from report of Vice Consul J. H. Morgan, Oct. 24, 1928, Budapest.

[1] 1920 and 1921 not available. [2] Not available.

INTERNATIONAL TRADE IN SHEEP AND GOATS

The export of sheep, lambs, and goats from Hungary dropped from 46,741 in 1925 to 38,918 in 1926 and to 24,570 in 1927. The decline in exports was the result of weakened demand in customer countries and to increased competition in the markets of central and western Europe. Switzerland took 13,349 sheep in 1927 as compared with 24,463 in 1926. Exports to various other countries were as follows: To Czechoslovakia, 6,502 in 1927, as compared with 8,370 in 1926; to Austria, 3,384 as compared with 4,051; to France, 1,292 as compared with 1,931; to other countries 43 in 1927, as compared with 103 sheep in 1926.

A small amount, 467,000 pounds of fresh mutton, lamb, and goat meat was exported in 1927 as compared with 498,000 pounds in 1926.

WOOL

Under the Austro-Hungarian Monarchy the textile industry was little developed in the Comitats now comprising Hungary. Most of the commercial wool produced was shipped to the mills in Bohemia, Moravia, and Silesia, or to Germay and other countries. Since the treaty of Trianon, the Hungarian woolen industry has recovered very slowly. In 1922 the production of domestic mills covered about 10 per cent of the requirement; in 1923, about 25 per cent; and, in 1924, about 40 per cent. In 1924, there were 25,000 spindles and 1,100 looms in operation.

In 1926 the wool clip was estimated at 16,534,500 to 17,626,800 pounds, most of which was shipped abroad. The total export was 13,934,174 pounds, or about 8.5 per cent less than the 15,234,006 pounds exported in 1925. Of this export, 6,233,727 pounds went to

Germany, 5,002,899 pounds went to Czechoslovakia, and 1,017,643 pounds went to Italy.

The production of wool, in 1927 was about the same in quantity as in the previous year, but the quality was, according to test washings, 1 to 2 per cent better.[39] In recent years the smaller farmers have devoted greater care to sheep breeding and have taken better care of the wool than before the World War.

The home industry in 1927 bought 6,600,000 pounds, and the remainder, for the most part, was exported. The various leading countries to which wool was exported and the quantities taken were as follows: To Germany, 5,054,000 pounds; to Czechoslovakia, 2,791,000 pounds; to Rumania, 736,000 pounds; to Austria, 575,000 pounds; to Poland, 485,000 pounds; to Belgium, 323,000 pounds.

Hungary imported 4,511,000 pounds of wool in 1927, as compared with 2,325,633 pounds in 1926.

At the present time, Hungarian wool is not known on the European market. There are no associations to bring the farmers and the export buyers together. According to United States Commercial Attaché W. A. Hodgman, about 75 per cent of German wool, 90 per cent of Australian, and 90 per cent of South American wool is of first quality. Only a very small proportion of Hungarian wool comes up to the quality produced in these countries. The Hungarian farmer knows nothing about modern preparation of wool for marketing and usually packs the wool without airing, which gives the product a yellow color.

MEAT PRODUCTION AND CONSUMPTION

No data are available relative to home slaughterings in Hungary before or since the World War, but the numbers of animals reported to have been slaughtered in officially recognized slaughterhouses in the former Kindgom had been gradually increasing with the exception of sheep and goats from 1893 until 1913.

During the 20-year period ended 1913, there had been a continuously steady increase in the numbers of cattle and swine slaughtered for each 100 inhabitants. (Table 53.)

Unofficial figures (*15, p. 44–45*) indicate that there has been an increase in meat consumption in Hungary between 1924 and 1926. The numbers of animals killed in slaughterhouses in 1924, showed an increase of 9.9 per cent over 1923. The following year, the increase reached 39.2 per cent and, in 1926, was 59.7 per cent greater than in 1923.

Comparing the data for 1926 with the 1909–1913 average given in Table 53 indicates that the supply of meat from slaughterhouses per 100 inhabitants in Hungary was greater than it was in the old Kingdom, about half of whose inhabitants ate meat not more than 10 times during the year. The treaty of Trianon segregated from Hungary the districts of lowest meat consumption—Slovakia, Ruthenia, Transylvania, Voivodina, Croatia, and Slavonia. It is to be expected that the statistical disappearance of meat in Hungary, including Budapest, would be greater than in the old Kingdom, including the

[39] The wool department of the Hungarian General Credit Bank estimated the 1927 clip at approximately 16,500,000 pounds of wool. MORGAN, J. H., PRODUCTION OF WOOL AND NUMBER OF SHEEP IN HUNGARY. Cons. Rpt. Jan. 14, 1928, 2 p. 1928. [Typewritten copy on file in Bureau Agricultural Economics Library.]

TABLE 53.—*Animals slaughtered for general consumption in the old Kingdom of Hungary, for specified years*

Year	Public slaughter-houses	Bulls	Steers	Cows	Young cattle	Water Buffaloes	Calves	Sheep	Lambs	Goats	Kids	Swine	Horses
Average:	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*
1893–1895	2,065	9,806	172,443	237,584	111,356	6,826	432,274	974,740	649,094	26,026	31,404	758,244	(1)
1896–1900	2,105	12,010	183,989	296,767	131,500	9,063	465,391	747,869	570,256	24,109	30,893	831,763	(1)
1901–1905	2,224	16,191	181,294	305,349	169,256	9,554	502,136	717,848	537,088	18,768	15,855	1,011,722	2,682
1906–1910	2,174	26,078	183,699	307,977	195,025	14,102	561,185	758,404	584,229	20,783	18,203	1,239,844	7,740
1909–1913	2,244	31,417	156,633	343,132	[2] 211,946	12,470	[2] 574,916	840,403	593,340	27,099	22,461	1,473,866	12,500
1909	2,139	32,950	189,658	402,956	[2] 279,773	27,562	[2] 743,687	900,496	605,508	24,762	18,227	1,379,790	8,149
1910	2,359	27,433	174,207	401,209	[2] 220,193	13,825	[2] 635,737	834,050	641,098	21,674	23,884	1,301,105	11,194
1911	2,341	28,542	150,956	307,220	[2] 164,796	8,293	[2] 524,114	787,374	572,803	27,636	20,843	1,315,974	15,296
1912	2,298	32,161	141,503	283,946	[2] 169,639	6,463	[2] 554,189	808,991	597,531	31,714	32,193	1,564,517	14,551
1913	2,083	35,999	126,841	320,327	[2] 225,320	6,209	[2] 416,853	871,104	552,201	29,707	17,159	1,819,315	13,311

PER 100 INHABITANTS

Average:													
1893–1895	0.013			3.43		0.04	2.79		10.49	0.37		4.89	(1)
1896–1900	.013			3.82		.06	2.85		7.87	.34		5.08	(1)
1901–1905	.012			3.87		.06	2.89		7.22	.20		5.82	0.02
1906–1910	.012			3.92		.08	3.09		7.39	.22		6.82	.04
1909–1913 [3]	.012	0.17	0.86	1.88	1.16	.07	3.15	4.60	3.25	.27		8.07	.07
1926 [4]		.23	.47	1.54			4.69	4.37				14.17	.20

From Magyar Statisztikai Évkön. 1896: 148; 1900: 104; 1912: 140; 1913: 99.

[1] No report.
[2] The young cattle that were slaughtered in Budapest are included with calves.
[3] Population 1910 excluding Croatia and Slavonia=18,264,533.
[4] Die Volkswirtschaft Ungarns im Jahre 1927. (*15, p. 45.*)

outlying districts of low consumption. Nevertheless, if the meat produced by the animals killed in the slaughterhouses of Hungary, in 1926, be compared with that produced by the same slaughterhouses before the World War, an increase of 29.5 per cent is indicated (*15, p. 45*). It appears that more calves, but less mature cattle, are being slaughtered than before the war. The numbers of swine passing through slaughterhouses of Hungary in 1926, was 75.6 per cent greater than the official slaughterings of the old Kingdom before the war. It must be remembered, in this connection, that the pork produced in slaughterhouses represents only a small portion of the pork consumed in the country as a whole. Large numbers of swine, lambs, goats, fowls, and hares are slaughtered at home whereas cattle and horses, without exception, are killed in official slaughterhouses.

It has been noted, in recent years, that householders in Budapest and other large centers show a tendency to keep pigs and fowls at home for family use. The numbers of such animals that are consumed at home do not appear in public records. However, the number of licenses issued to city householders to slaughter swine at home increased from 355, in 1923, to 1,624, in 1926. Many more than this number slaughter without license.

Hungary is undoubtedly eating more pork, fowls, and horse meat than before the war. Less numbers of cattle have been slaughtered but, on the other hand, the weights of cattle slaughtered during the first six months of 1927 averaged greater than during the last six months of 1926. Bulls weighed 1,230 pounds in 1927 as compared with 1,202 pounds in 1926; steers 1,380 pounds as compared with 1,349 pounds; and cows 1,089 pounds in 1927 as compared with 1,056 pounds in 1926. It may be that decreased numbers of cattle slaughtered may in a measure be compensated for by the increased average weight of the animals sent to the block.

SUMMARY

Hungary is an agricultural country in which the manufacturing industries are of secondary importance. Hungary produces exportable surpluses of practically all farm products. In 1927, plowlands reached 60.3 per cent of the total area; meadows and pastures, 18.1 per cent; forests, 11.7 per cent; gardens and vineyards, 3.4 per cent; and 6.5 per cent was in reeds or was unproductive.

The people of Hungary are Magyars—of Asiatic origin similar to the Finns. They are highly intelligent and traditionally patriotic. They are a home-loving folk deeply attached to the soil of their ancestors.

The soil of Hungary is generally a fertile black loam except for sandy stretches, particularly along the eastern banks of the Danube River. The great handicap to agriculture is the precarious climate. Droughts are common during the growing season and short crops must be expected occasionally, as in 1924.

There was a land reform in Hungary as in other succession States, during which 1,590,000 acres changed hands. The scope of this land reform was not as sweeping as in Russia and Rumania, but its effects are perceptible.

Hungary had nearly 500,000 more acres under plow in 1927 than before the World War, at the expense of meadows, pastures, and forests. In 1928 cereal acreage was 104 per cent of the pre-war

average; potatoes, 105.8 per cent and sugar beets, 125.2 per cent. On the other hand, cattle were 90.5 per cent of the 1911 census numbers, swine, 82.8 per cent, and sheep 66.6 per cent. Horses alone show several thousand more head than before the World War. It is probable that the locally bred livestock have practically recovered their pre-war status but that this number is considerably less than reported in 1911 because at that time thousands of lean animals shipped in from outlying districts were being fattened in the feed lots about Budapest and in the western counties between Budapest and Vienna.

Hungary is primarily a wheat-producing country, 41 per cent of the cereal acreage being under wheat in 1928. Wheaten bread forms the basis of the peasant diet whereas in Austria, Czechoslovakia, Germany, Poland, and eastern Europe the common bread is rye. Excepting the poor crop season of 1924–25, wheat production in Hungary in recent years has been greater than before the World War. During 1927–28, Hungary exported (net) 21,491,000 bushels of wheat and flour in terms of grain as compared with an estimated average surplus of 20,489,000 bushels during 1909–1913.

Budapest, next after Minneapolis, was the largest milling center in the world before the World War. Since the war, on account of governmental regulation and heavy taxation, the flour-milling industry has been permanently crippled, and some of the large mills have been dismantled. In 1913 the total wheat and wheat-flour exports (in terms of grain) of the entire Kingdom of Hungary amounted to 55,233,000 bushels, 18,433,000 bushels of which were exported as grain and 36,800,000 bushels as flour. In 1927–28 Hungary exported (net) 21,491,000 bushels of wheat, 12,004,000 bushels as grain, and 9,487,000 bushels as flour.

Just before the World War, the acreage of wheat in Hungary had become practically static although production fluctuated with the fluctuating changes in climate. In good seasons the people of Hungary used more wheat, but, also, the merchants and mills exported more wheat than was, on the average, customary. On the other hand, during poor crop seasons a less-than-average quantity of wheat was eaten and exported. Since the World War, Hungary has been exporting the maximum volume of wheat possible and has left within the country only the smallest quantity that would maintain the population. The Government has encouraged the use of rye as a wheat substitute. As a result, the per capita net disappearance of wheat during 1922–23, 1923–24, 1925–26, and 1926–27 appears to have been nearly static, varying only slightly above or below the mean level of 4.98 bushels. This has resulted in a high correlation of 0.999 between per capita net production and per capita net exports.

This indicates that under the conditions that prevailed during these four years there was an average tendency for the per capita net production of any given year to be associated with per capita net export equivalent to 4.92 bushels less than 0.9909 times the production or $E' = 0.9909\ P - 4.92$.

There was 68 per cent tendency for observed per capita net exports to approximate the calculated exports within a range of $\pm\sqrt{\frac{\Sigma(E-E')^2}{n}}$, which, in this case was ± 0.03 and a 99 per cent tendency that under average conditions the range would approximate ± 0.09 bushel per capita.

In 1927, per capita net production of wheat was 7.65 bushels. Under the average conditions that prevailed during the four years 1922–23, 1923–24, 1925–26, and 1926–27, there were 68 chances in 100 that per capita net exports during the season 1927–28 would approximate $(0.9909 \times 7.65) - 4.92$ or 2.66 bushels within a range of ± 0.03 bushel, 95 chances that the range would be ± 0.06 bushel, and 99 chances that the range would be ± 0.09 bushel per capita. That is to say, that in 99 per cent of cases the export could be expected to range from 2.57 to 2.75 bushels per capita, if conditions remained average. The actual net export during the season 1927–28 was 2.52 bushels per capita or 0.05 bushel below the lower limit of range.

The price relationships of wheat in Hungary and in near-by importing countries was not sufficiently wide to exercise an average pull on Hungarian wheat during the crop year 1927–28. On the other hand, rye prices abroad were relatively high and rye moved abroad in spite of a short crop at home, resulting in the greater use of wheat and the lesser use of rye in domestic bread making than was the case the previous season. Domestic disappearance of wheat rose to the post-war maximum of 5.13 bushels per capita.

The producton of rye in Hungary is of third-rate importance, being superseded by wheat and corn. Before the World War, the Comitats now comprising Hungary produced an estimated rye surplus of about 15,826,000 bushels. Since the war, rye acreage has increased; but even excluding the poor crop season of 1924–25, the average production of recent years has been somewhat less than that of pre-war.

Per capita disappearance, however, has averaged about 2.25 bushels during 1922–23, 1923–24, 1925–26, and 1926–27, as compared with 1.4 bushels before the World War. This has resulted in decreased net exports ranging from 2,572,000 bushels in 1922–23 to 10,240,000 bushels in 1926–27. During these four years there was a correlation between per capita net production and per capita net exports of ± 0.74. On the average, the calculated per capita net export of rye associated with the production of any one year was found by the equation $E' = 0.7556P - 1.51$.

There was a 68 per cent tendency for observed per capita net exports to approximate the calculated exports within a range of ± 0.216 bushel, a 95 per cent tendency toward a range of ± 0.432 bushel, and a 99 per cent tendency toward a range of ± 0.648 bushel.

In 1927, per capita net production of rye was 2.04 bushels. The calculated per capita net export that could be expected to be associated with a production of 2.04 bushels would (under the average conditions that prevailed during 1922–23, 1923–24, 1925–26, and 1926–27) be approximately $(0.7556 \times 2.04) - 1.51$ or 0.03 bushel. That is to say, in 99 per cent of cases the crop-year's balance would range from an import of 0.618 bushel to an export of 0.678 bushel per capita.

The actual net export during the crop year 1927–28 was 0.525 bushel per capita or 0.123 bushel below the upper limit of range.

The surplus rye-producing Comitats lie in the northwestern part of Hungary along the Danube, easily accessible to the importers of Austria and Czechoslovakia, but not easily accessible to the merchants of the deficit Comitats of the interior of Hungary. These interior Comitats are near to the southern surplus wheat-producing Comitats. The price differences between rye in Hungary and in the near-by importing countries was greater than average and exerted such a strong pull

that, in spite of a rye shortage at home, a very considerable quantity of rye was shipped abroad.

The export situation as regards wheat and rye should be considered from the collective viewpoint of bread cereals rather than from that of either cereal taken separately. Not only is rye employed as a substitute for wheat in Hungarian bread, but merchants show a preference for exporting whichever cereal offers the greatest margin of profit, so that wheat and rye, as export commodities, are, in a sense, interchangeable depending upon the relative price relationships of either cereal in Hungary as compared with the prices offered in importing countries.

The decreases in both acreage and production of barley in Hungary are probably aftereffects of the land reform. The years of highest post-war export show that shipments abroad have been about one-fourth of the estimated pre-war average. It is probable that a growing animal industry will make increasing demands upon domestic production so that barley exports will probably not in future reach their pre-war magnitude of 8,609,000 bushels.

Acreage and production of oats in Hungary seem to be on the decline. The increasing use of automobiles has reduced the city demand. The influence of peasant farming is now greater than formerly on account of the land reform. The peasants of Hungary do not utilize oats to the extent that they are fed in northwestern Europe. More corn is fed on small holdings and therefore, following the land reform, the area seeded to oats will probably tend to remain below the pre-war average.

Horse breeding will probably not expand greatly and domestic utilization will probably tend to remain about 19,000,000 bushels annually. Exports will probably tend to fluctuate with fluctuations in production.

Corn is, next to wheat, the most important field crop in Hungary. The increased preponderance of peasant farming in Hungarian agriculture has tended to stimulate corn production but on account of the precarious climate yields fluctuate widely. (Table 34.) There is a correlation between corn and hog production in Hungary similar to that in the United States and therefore exports fluctuate in response to the influence of domestic and foreign demand upon production. It is probable that disappearance of corn in Hungary will tend to increase in response to the demands of a growing animal industry, but as indicated during the seasons 1924–25 and 1925–26 exports will tend to range far above the pre-war average of 1,196,000 bushels.

The acreage of potatoes takes sixth place among Hungarian field crops and does not occupy such an important position in the farm life of the nation as in Czechoslovakia, Germany, or Poland. Since the World War, acreage has tended to range above, and with the exception of the crop year 1927–28, production below the pre-war levels. Disappearance has also been less with the exception of 1925–26 than before the World War and in recent years exports have been higher than the pre-war average of 893,000 bushels.

Between 1924 and 1928, acreage of sugar beets has been greater and production has averaged about the same as the period 1909–1913. Production of sugar, however, has only once (in 1924–25) reached the pre-war level of 222,306 short tons and exports since 1923–24 have averaged about 90,000 short tons or about one-tenth as much sugar as

is shipped annually from Czechoslovakia. The industry of Hungary has been hampered by so-called governmental participation and although exports may increase somewhat they will probably not tend to materially affect the markets of western Europe.

As in all countries in which the tobacco industry is conducted as a Government monopoly, acreage and production of tobacco in Hungary are regulated to return a profit to the State. Both acreage and production in recent years have ranged below the pre-war levels, but the situation is of little interest to American growers as the consumption of American tobacco in Hungary is negligible and Hungarian tobacco does not compete on European markets with that grown in the United States.

Hungary produces no cotton. In 1927, the spinning industry utilized 16,770,000 pounds, more than 75 per cent of which originated in the United States. The industry is slowly developing.

Whereas meadows and pastures and fodder plants have changed but little in acreage in recent years, fodder production in Hungary appears to have increased during the four years ended 1927. The development of the livestock industry depends upon cultivated forage production, because the area of meadows and pastures which are almost universally common village property, is strictly limited. Future improvement in the forage situation will probably follow the lines of better varieties and seed rather than changes in acreage as the area can not be increased to any material extent without decreasing that of cereals, potatoes, or sugar beets.

During the centuries, as life has changed from one of warfare to that of farming, the preferences of Hungarian peasants have shifted from horse breeding as their main occupation to swine and cattle production. In this direction the Hungarians have made great progress so that the number of animals to be grazed on village pastures, the adaption of breeds to given localities, the number of sows bred to a single male, the qualities of males as to breed characteristics, and other questions are under the observation of the rural police. To a great extent, the primitive breeds of cattle, sheep, and swine common to southeastern Europe have been replaced by improved breeds from the northwest and the native strains of horses have been bred up to a standard of excellency of world-wide recognition.

Hungary is a corn-growing country and a potential producer of pork and pork products that may compete with the United States in south central Europe at least. At present, lard from the United States has penetrated into Austria, Czechoslovakia, and western Yugoslavia, all of which countries border on Hungary. Up to 1926, Hungary has not been able to compete with fats and bacon from the United States except on those markets where the consumers were prejudiced in favor of the Hungarian product. But when the political and economic situation has reached greater stability in Europe, Hungary will undoubtedly offer American pork and pork products sharp competition in central Europe. In 1927, Hungary exported 116,507 hogs, 9,900,000 pounds of lard, and 8,700,000 pounds of fat sides and bacon.

Dairying has been rapidly replacing the breeding of cattle for draft purposes in Hungary, since 1926, fully 83.4 per cent of all cattle were of improved stock. There is, in the American acceptation of the term, no beef breed in Hungary. Dairying will probably, at no future

time, reach proportions greater than required to cover local needs and to supply a part of Vienna's milk and meat requirement. The quality of meat exported to Austria is very poor according to American standards. In 1927, Hungary exported 74,000 cattle of all classes, and 2,302 were imported.

The foundation stock of Hungarian horse breeding is the small Asiatic breed that carried the Magyar hordes across Russia and part of Europe in an unbelievably short time. These wiry little horses of the light cavalry type are in demand in surrounding countries. Nearly 30,000 colts and horses were exported in 1927.

The most usual sheep of residual Hungary is the Spanish merino, constituting about two-thirds of all herds. About 12 per cent of all sheep are English meat types, whereas about 22 per cent are aboriginal coarse wool, milk sheep. Hungary exported approximately 10,000,000 pounds of wool in 1927 and imported about 4,500,000 pounds.

Hungary is an agricultural country in which industries are relatively little developed. It is not possible to expand the agriculture of this country to any marked degree except by improved breeds of plants and animals and by improved methods.

The aim of the Hungarian peasant is a peaceful existence. He is slow to change his agricultural habits. It is probable that the animal industry will be given a place of greater importance in the future than in the past; but any changes in this direction will be effected gradually. Unless marked improvement is made in production methods, the long-time competition of Hungary with the farmers of the United States will be marked by decreased exports of cereals and increased shipments of animals and animal products up the Danube River.

AVERAGE VALUES OF THE HUNGARIAN CROWN AND PENGÖ

The monthly average values of the Hungarian crown, July, 1921, to December, 1925, and the Hungarian pengö, January, 1926, to December, 1928 are given in Table 54.

TABLE 54.—*Monthly average values of the Hungarian crown, July, 1921, to December, 1925, and of the Hungarian pengö, January, 1926, to December, 1928*

Month	Cents per crown					Cents per pengö		
	1921	1922	1923	1924	1925	1926	1927	1928
January	------	0.15	0.04	0.0039	0.00135	17.55	17.53	17.47
February	------	.15	.04	.0033	.0014	17.56	17.53	17.47
March	------	.13	.03	.0015	.0014	17.56	17.51	17.47
April	------	.13	.02	.0014	.0014	17.56	17.48	17.46
May	------	.13	.02	.0013	.0014	17.56	17.46	17.46
June	------	.11	.01	.0012	.0014	17.56	17.44	17.45
July	0.33	.08	.01	.0012	.0014	17.57	17.44	17.44
August	.26	.06	.01	.0013	.0014	17.56	17.44	17.43
September	.19	.04	.01	.0013	.0014	17.50	17.47	17.43
October	.14	.04	.01	.0013	.0014	17.56	17.46	17.43
November	.11	.04	.01	.0013	.0014	17.56	17.47	17.42
December	.15	.04	.01	.0013	.0014	17.57	17.48	17.42
Average yearly value	------	.09	.016	.00169	.0014	17.56	17.48	17.46

From Federal Reserve Board:
Par value of the gold crown=20.26 cents.
Par value of the pengö=17.49 cents.
One pengö=12,500 paper crowns.

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