WHEAT STUDIES

OF THE

FOOD RESEARCH INSTITUTE

VOL. VII, NO. 7 (Price $1.50) JUNE 1931

THE WHEAT SITUATION IN SCANDINAVIA

DURING the past twenty-five years wheat has gradually displaced rye as the primary bread cereal in Scandinavia. Wheat production has increased while rye production has decreased; and net imports of wheat have increased while net imports of rye have declined. In Denmark and Sweden, at least, the demand for wheat and for rye appears to be quite elastic within the lower price ranges; for under appropriate price conditions large quantities of the lower grades of these cereals are utilized as feed. There is no conclusive statistical evidence of extensive year-to-year substitution of wheat for rye or of rye for wheat, but statements of competent observers suggest that such substitution is common when price relationships justify it.

About half of the wheat utilized in Scandinavia during post-war years was of domestic origin. Post-war average yields per acre of wheat were characteristically high, ranking in each of these countries among the ten highest recorded in the world. Most of the wheat (including flour) imported into Scandinavia during the past decade originated in North America. Norway took about half of her total net imports in the form of flour; Denmark took over one-third of her imports in that form; while in Sweden net imports of flour amounted to less than one-tenth of the total.

Prices of native wheat in Denmark ruled fairly consistently below British parcels prices during post-war years. In Sweden and Norway, on the other hand, tariffs and other governmental measures kept prices of native wheat above British parcels. As in a number of other European countries, prices of native wheat in Denmark and Sweden showed a tendency to rise relative to the price of British parcels toward the end of each crop year.

STANFORD UNIVERSITY, CALIFORNIA

June 1931

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The central feature of the series is a periodic analysis of the world wheat situation, with special reference to the outlook for supplies, requirements, trade, and prices. Each volume includes a comprehensive review of the preceding crop year, and three surveys of current developments at intervals of about four months. These issues contain a careful selection of relevant statistical material, presented in detail in appendix tables for reference purposes, and in summary form in text tables and charts.

Each volume also includes six special studies bearing on the interpretation of the wheat situation and outlook or upon important problems of national policy. Subjects of issues published in recent volumes are listed inside the back cover.

The series is designed to serve the needs of all serious students of the wheat market, in business, government, and academic circles, by summarizing and interpreting basic facts and presenting current developments in due perspective. The special studies are written not merely for students of the wheat market, but as well for various groups of readers who are especially concerned with the fields discussed.

Volumes I–VI are now available, bound in red buckram, at $10.00 each. The ten issues of Volume VII will be published monthly from November 1930 to September 1931, except in April 1931. The subscription price for the volume, including a temporary binder, is $10.00. Individual issues may also be purchased separately. Orders, subscriptions, and other communications should be addressed to FOOD RESEARCH INSTITUTE, STANFORD UNIVERSITY, CALIFORNIA; for Great Britain, to P. S. King & Son, Ltd., Orchard House, 14, Great Smith Street, Westminster, S.W. 1, London; or, for continental Europe, to Martinus Nijhoff, 9 Lange Voorhout, The Hague, Holland.

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THE WHEAT SITUATION IN SCANDINAVIA

INTRODUCTION AND SUMMARY

In most analyses of the world wheat situation, the Scandinavian countries naturally receive but little attention; neither Denmark, Sweden, nor Norway is a notably large producer or consumer of wheat. Their aggregate production and utilization, however, are significant. Moreover, special interest attaches to a study of wheat consumption in Scandinavia, because of the position of rye in the diet of the Scandinavian peoples. In a wide area in Europe of which Scandinavia is a part, wheat and rye may be said to compete for land and in consumption; and a good deal of interest attaches to the record of this competitive process.

The present study has been designed primarily for the purpose of furnishing students of the wheat problem with the significant facts regarding the wheat situation in Scandinavia. Some twenty pages of the study are devoted entirely to the presentation of charts which illustrate in a manner easily grasped the major features of the wheat situation in each of the three Scandinavian countries. Later pages comprise a brief analysis of the outstanding facts regarding wheat production, consumption, prices, and trade in these countries. No attempt has been made to produce a complete and exhaustive study of the various phases of the wheat situation in Scandinavia. Official data of considerable importance have in several instances been omitted from the study because they were not readily available to us, and in a few of the appendix tables we have used official data collected and published by the International Institute of Agriculture, available in our files, rather than official data from primary sources. The charts and the data in the appendix tables suggest more questions concerning the wheat situation in Scandinavia than we are in a position to answer. The answers to some of these questions may be matters of common knowledge among Scandinavian millers and traders; the answers to others might have been secured if time had been taken to make a more exhaustive study of the published literature on Scandinavian agriculture. Despite these limitations, however, we believe that the present study has a place in the literature of the world wheat problem. It represents a collection and an analysis of organized data regarding the Scandinavian wheat situation more complete, as far as we know, than have hitherto been published.

In the following presentation the emphasis falls upon data for the past decade, although some consideration is given to pre-war and war-time statistics. Few strictly comparable pre-war comparisons are available for Denmark, since the boundaries of that country were changed after the war; even so, the pre-war averages seem to throw additional light upon the subjects considered and have therefore been presented.

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Over the past 25 years there has been a marked upward trend both in the total and in the per capita utilization of wheat in Scandinavia. It has been accompanied by a marked downward trend both in the total and in the per capita utilization of rye. Indeed, since 1927–28 more wheat than rye has been utilized, a situation in striking contrast to that which prevailed in the earlier years of the present century. During most post-war years wheat utilization in Scandinavia was maintained within the limits of 40 to 55 million bushels; thus, it closely approximated the wheat utilization of Hungary, exceeded that of the Netherlands, and fell but slightly below that of Belgium. Per capita wheat utilization was strikingly low in Scandinavia until the last few years, when it has ranged between 4 and 5 bushels. Denmark recently utilized moderately large amounts of wheat per capita, while Sweden and Norway (espe-

cially Norway) have utilized smaller amounts.

Little direct evidence of extensive year-to-year substitution of wheat for rye or of rye for wheat is to be found in the domestic utilization data of the three Scandinavian countries. In two or more post-war years short wheat supplies were accompanied by large rye supplies in each of the countries, and in two or more years short rye supplies were accompanied by large wheat supplies; but there were also years when both grains were scarce, and other years when both grains were abundant. Moreover, even in the seasons when supply conditions were such as to encourage substitution, there is no more statistical basis for assuming that substitution actually occurred than for assuming that year-end carryovers were changed. Nor is the statistical evidence more conclusive in regard to the substitution of wheat or rye for the feed grains, though the data do suggest that the demand for wheat for feeding purposes has probably been more elastic in Denmark than in either Sweden or Norway. But despite the fact that no definitive statistical evidence of extensive year-to-year substitution exists, we are influenced by the statements of competent observers to believe that when price relationships justify it, wheat is substituted for rye on a fairly large scale, and vice versa; and that when wheat prices are notably low relative to the prices of feed grains, wheat is fed to animals in much larger quantities than usual.

Something like 50 per cent of the wheat utilized annually in Scandinavia during the past decade was domestic in origin, while approximately 60 to 70 per cent of the rye utilized was domestic. Trends of wheat and rye production over the past 25 years show the same characteristics as do the trends of wheat and rye utilization; wheat has increased while rye has decreased. As a producer of wheat, Scandinavia has ranked fairly low in comparison with other European countries; but as a producer of rye she has been relatively more important. Aside from Russia, some eleven European countries—France, Italy, Spain, Germany, each of the four Danubian countries, Czecho-Slovakia, Poland, and the British Isles—consistently produced larger wheat crops during the past decade than did Scandinavia; but only four European countries exclusive of Russia — Germany, Poland, Czecho-Slovakia, and France — produced larger rye crops. Sweden, by far the largest wheat producer of the three Scandinavian countries, has turned out post-war wheat crops of about the same size as those of Belgium. Norway, on the other hand, has ranked in recent years as about the smallest wheat producer in Europe.

It is noteworthy that yields per acre of wheat have been strikingly high in Scandinavian countries. During 1920–30 officially reported yields per acre averaged higher for Denmark than for any other country of the world for which data are available; moreover, Sweden and Norway also ranked among the ten countries having the highest average yields for the period. Throughout Scandinavia yields per acre have been kept high partly at least by means of the application of fertilizers.

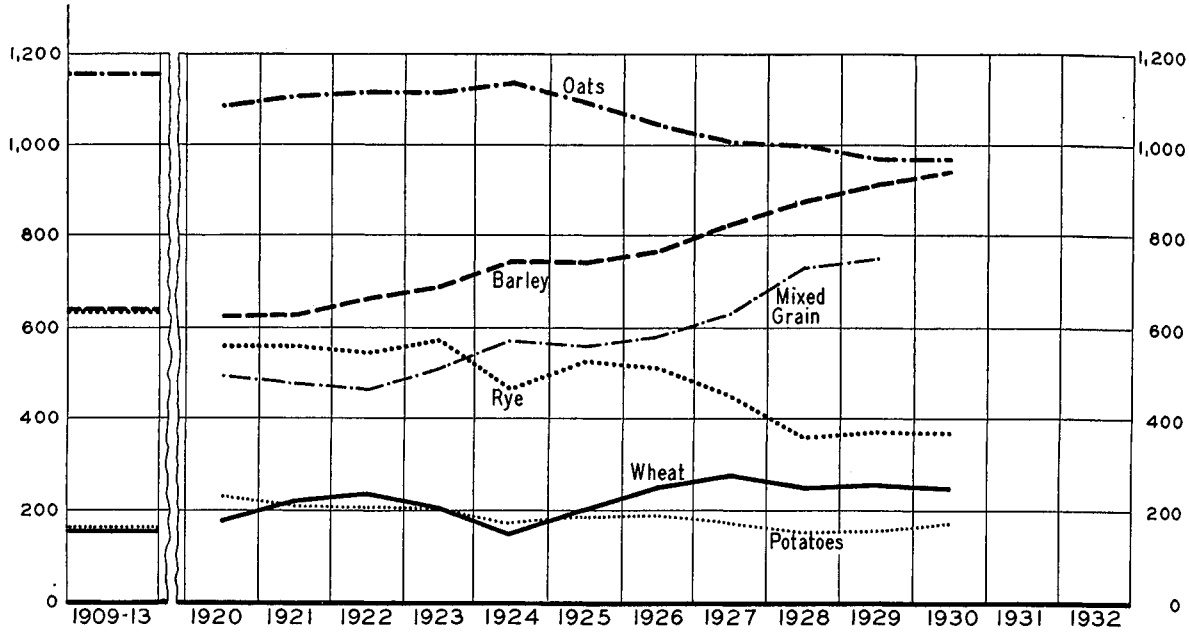
At 20 to 30 million bushels, net imports of wheat (including flour) into Scandinavia during most post-war years about equaled the wheat net imports of the Netherlands, and amounted to about half of the French net imports. Mainly because of the poor milling quality of the native wheat and because Russia has not recently been a large wheat exporter, Scandinavia purchased more wheat (including flour) from North America during the post-war decade than from all other exporting countries combined. Total net imports of wheat (including flour) into Scandinavia were approximately equally distributed among the three Scandinavian countries in certain post-war years; but in other years the distribution was decidedly unequal. Net imports into Norway varied little from year to year, while net imports into Denmark ranged (disregarding 1920–21 and 1921–22) between 6.0 million bushels in 1925–26 and 16.7 million bushels in 1928–29, a range which probably reflected, in part at least, an elastic demand for wheat for feeding purposes. Swedish net imports varied considerably more than did the net imports of Norway, but slightly less than did the net imports of Denmark. The flour imports of Scandinavia were not distributed equally among the three countries in any of the years. Both Norway and Denmark took

relatively large proportions of their total wheat and flour imports in the form of flour; net flour imports usually constituted about 45 to 50 per cent of the total net imports of Norway and about 35 to 45 per cent of the total net imports of Denmark. In Sweden, on the other hand, domestic milling facilities were more highly developed, and flour imports usually amounted only to around 5 to 10 per cent of the total net imports. Imports of wheat and flour into Denmark and Sweden showed evidence of marked seasonality, imports being typically large in the late fall and the spring and typically small in the mid-winter months. Norwegian imports showed a less distinct seasonal movement, but were generally large in October–December and generally small in January–February.

The price of native wheat in Denmark ruled fairly consistently below the price of British wheat parcels (imported wheat) during most of the post-war period for which data are available. Swedish and Norwegian native wheat prices, on the other hand, were generally higher than British parcels prices, reflecting the influence of wheat tariffs and of other governmental measures taken by the two latter countries to raise the prices paid to home producers. Among the other measures taken by Sweden were the introduction of export certificates, the enactment of a quota law, and the establishment of a scale of minimum prices; the Norwegian government, on the other hand, exercised control over prices mainly through the medium of the State Grain Monopoly, which at first monopolized only grain imports, but later was given authority to buy at specified prices the entire domestic wheat crop and to maintain strict regulation over the milling of wheat. It is important to note that in recent years the government has provided that wheat flour be sold throughout Norway at a uniform price. There is more or less conclusive evidence of recurrent seasonal movement in the Danish and Swedish wheat prices of post-war years; but there is no such evidence in the Norwegian prices. In Denmark and Sweden native wheat prices tended to rise relative to British parcels prices toward the end of each crop season; in Norway price-spreads were so irregular that if any such tendency existed it was obscured by other influences.

CHART 1.—UTILIZATION OF LAND IN DENMARK FOR EACH OF THE MAJOR CEREALS AND FOR POTATOES, PRE-WAR AND 1920–30*

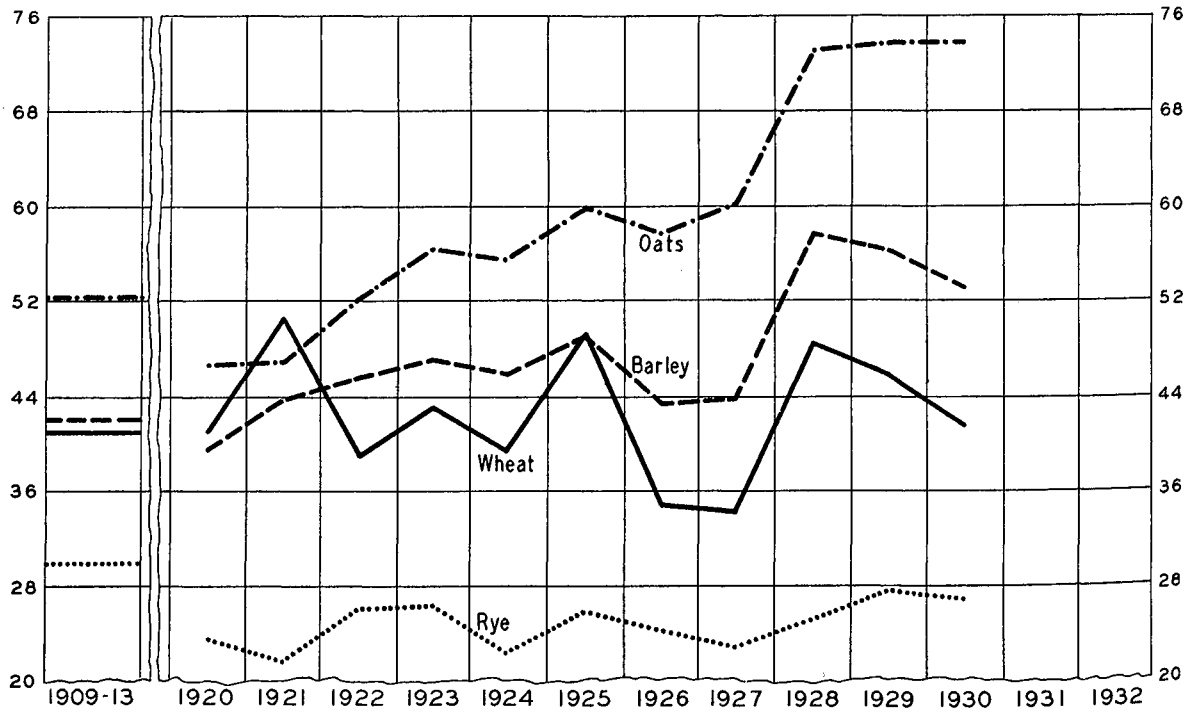
(Thousand acres)



* Based upon data in Appendix Table III. For discussion of chart see pp. 370–71.

CHART 2.—YIELDS PER ACRE OF THE MAJOR CEREALS IN DENMARK, PRE-WAR AND 1920–30*

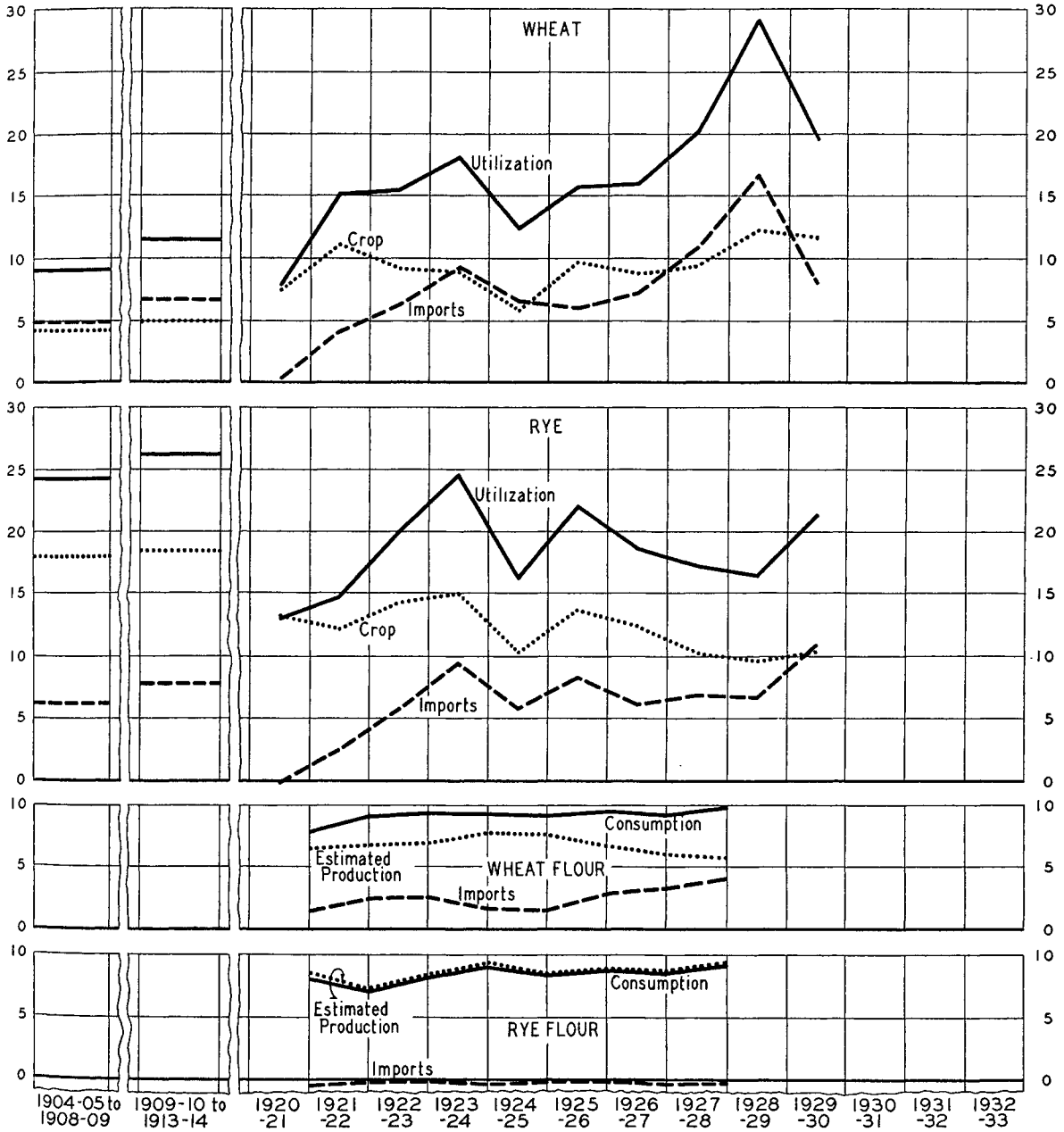
(Bushels per acre)



* Based upon data in Appendix Table III. For discussion of chart see p. 371.

CHART 3.—PRODUCTION, NET IMPORTS, AND DOMESTIC UTILIZATION OF WHEAT AND OF RYE IN DENMARK, PRE-WAR AND 1920–21 TO 1929–30; AND NET IMPORTS, ESTIMATED PRODUCTION, AND ESTIMATED CONSUMPTION OF WHEAT FLOUR AND OF RYE FLOUR, 1920–28*

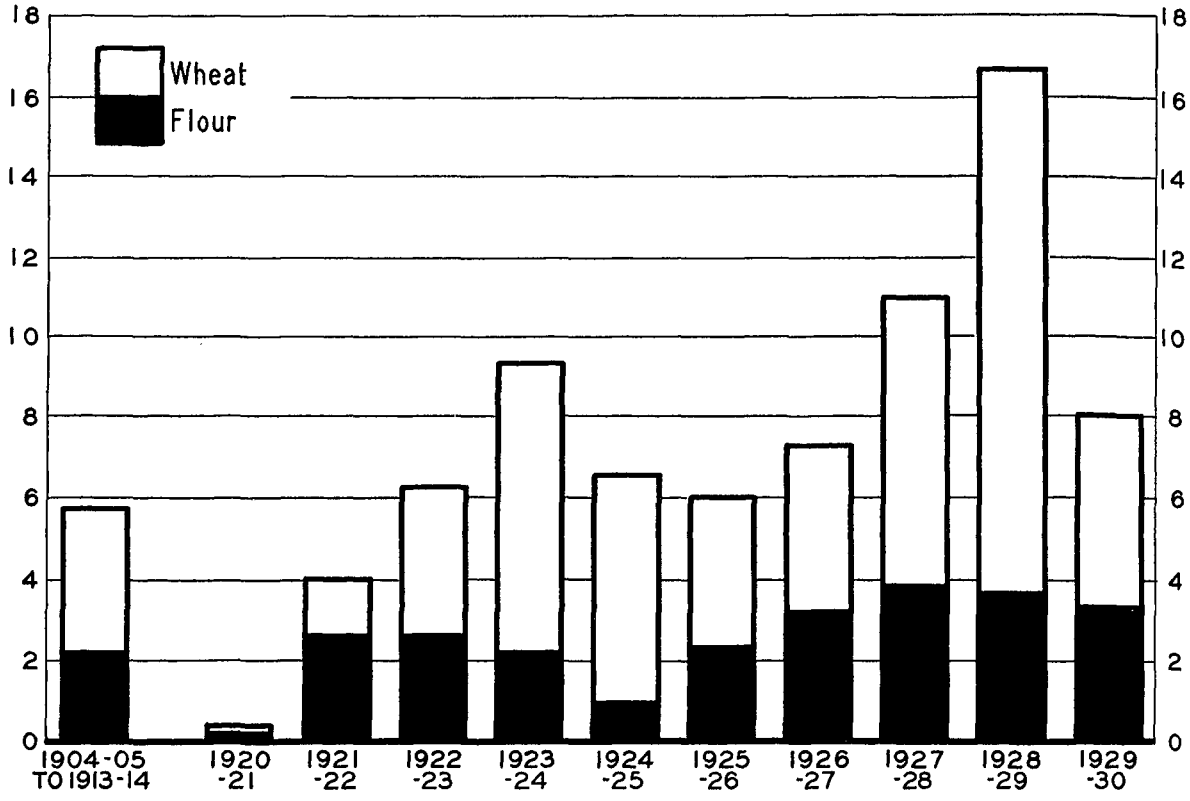
(Million bushels)



* Based upon data in Appendix Tables V and VIII. Data of flour milling and flour consumption probably unsatisfactory for many purposes. For discussion of chart see pp. 371–73.

CHART 4.—DANISH NET IMPORTS OF WHEAT AND OF FLOUR, PRE-WAR AND 1920–21 TO 1929–30*

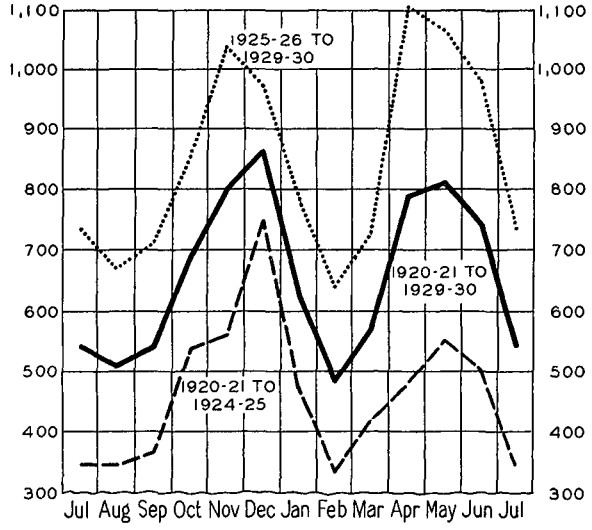
(Million bushels)



* Based upon data in Appendix Table XI. For discussion of chart see p. 374.

CHART 5.—AVERAGE SEASONAL MOVEMENT OF WHEAT AND FLOUR INTO DENMARK, 1920–21 TO 1929–30*

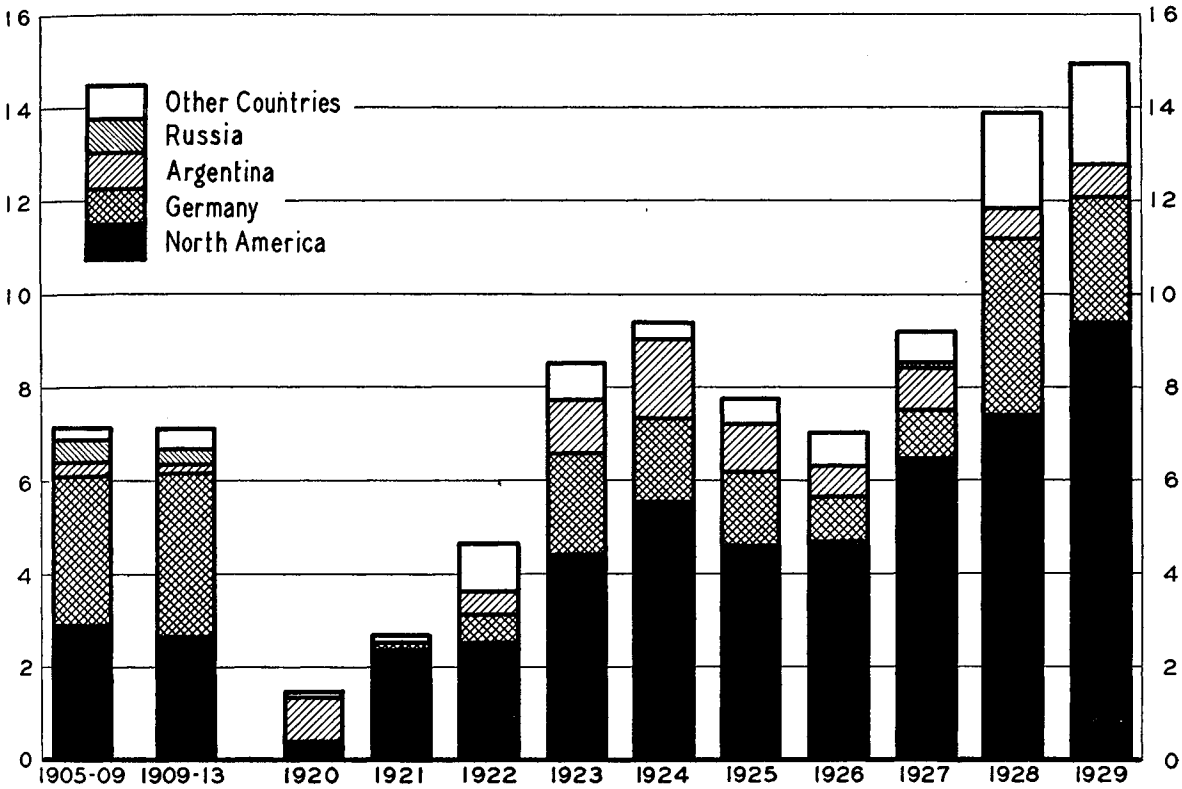
(Thousand bushels)



* Data from Appendix Table II. Discussion on p. 375.

CHART 6.—GROSS IMPORTS OF WHEAT AND FLOUR (AS WHEAT) INTO DENMARK, BY PRINCIPAL SOURCES, PRE-WAR AND 1920–29*

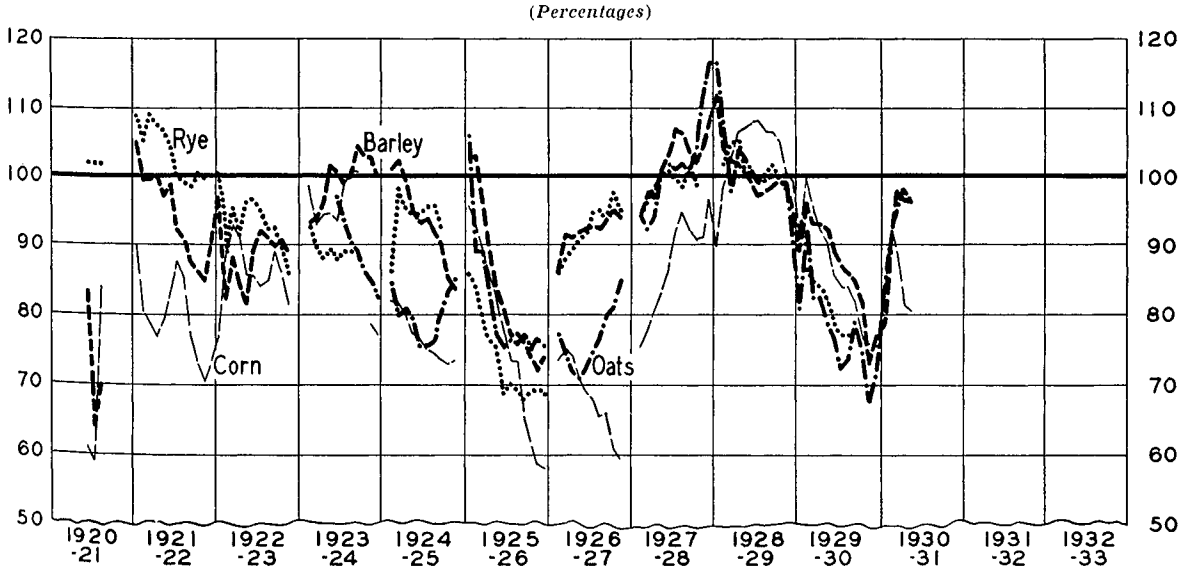
(Million bushels)



* Based upon data in Appendix Table III. For discussion of chart see p. 374.

CHART 7.—RATIOS OF RYE, OATS, BARLEY, AND CORN PRICES TO PRICES OF WHEAT IN DENMARK, MONTHLY, 1920–21 TO 1930–31*

(Percentages)



* Ratios calculated from data in Appendix Table XIV. For discussion of chart see pp. 374 and 376.

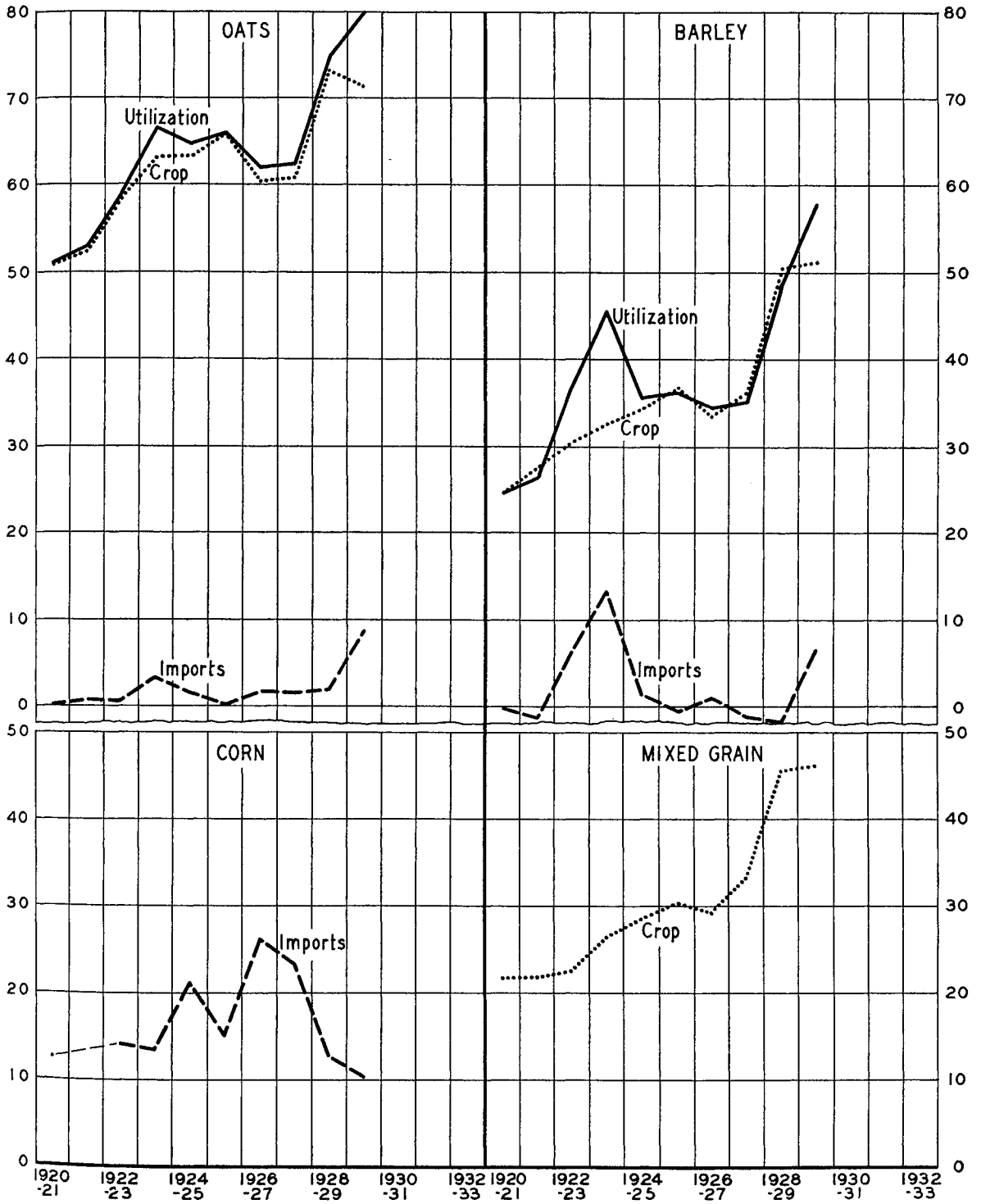
CHART 8.—AVERAGE MONTHLY PRICES OF DANISH WHEAT AND OF BRITISH WHEAT PARCELS, WITH SPREADS, 1920–21 TO 1930–31*

(U.S. dollars per bushel)

* Based partly upon data in Appendix Table XIV. British parcels price series explained in WHEAT STUDIES, July 1928, Vol. IV, No. 8. For discussion of chart see p. 375.

CHART 9.—PRODUCTION, NET IMPORTS, AND DOMESTIC UTILIZATION OF OATS, BARLEY, CORN, AND MIXED GRAIN IN DENMARK, 1920–21 TO 1929–30*

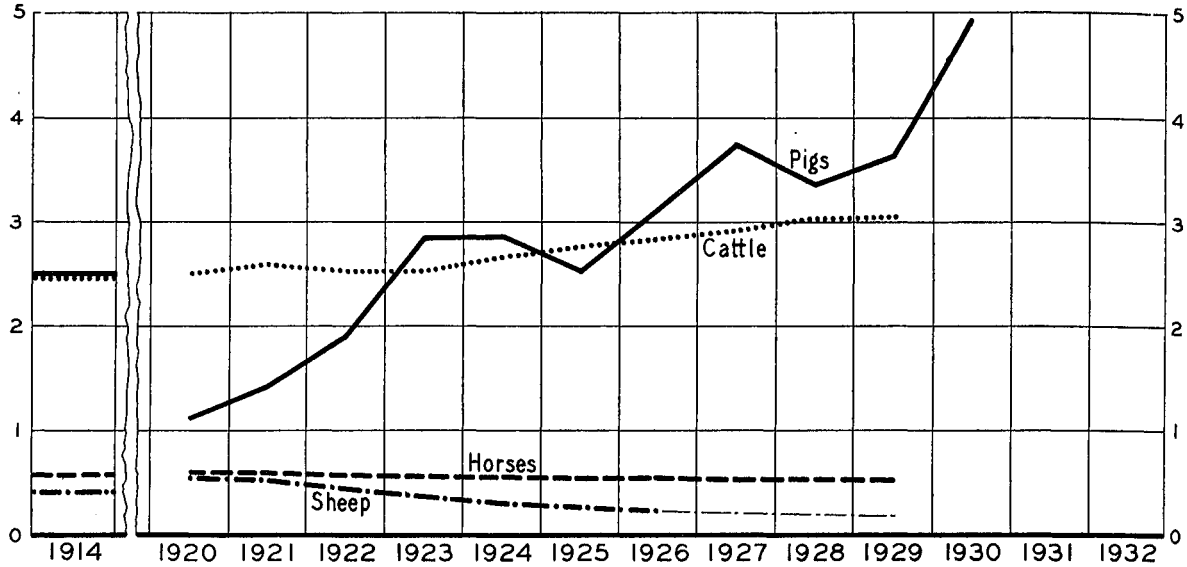
(Million bushels)



* Based upon data in Appendix Tables IV, VII, and XVIII. Data of corn imports not available for 1921–22. For discussion of chart see p. 376.

CHART 10.—LIVESTOCK POPULATION IN DENMARK, 1914 AND 1920–30*

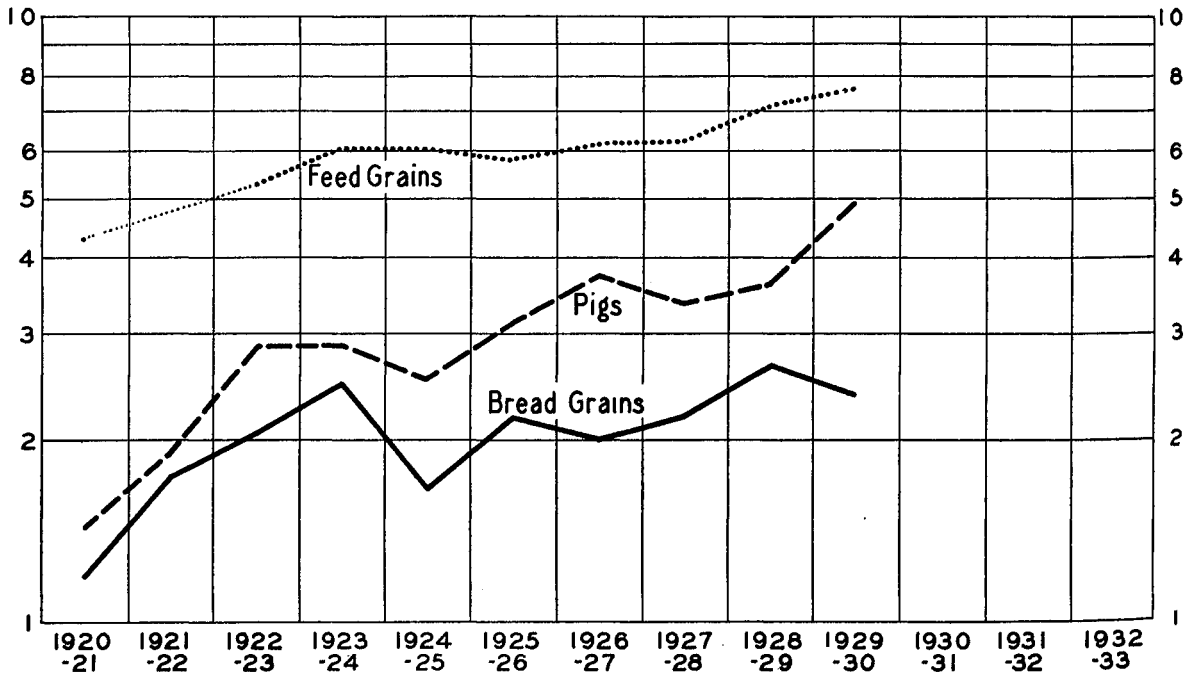
(Million head)



* Based upon data in Appendix Table XVII, which also includes data for 1930. Estimates of sheep population not available for 1927–28. The 1914 figures are for old boundaries. For discussion of chart see p. 376.

CHART 11.—TOTAL DOMESTIC UTILIZATION OF FEED GRAINS COMPARED WITH TOTAL DOMESTIC UTILIZATION OF BREAD GRAINS AND THE PIG POPULATION IN DENMARK, 1920–21 TO 1929–30*

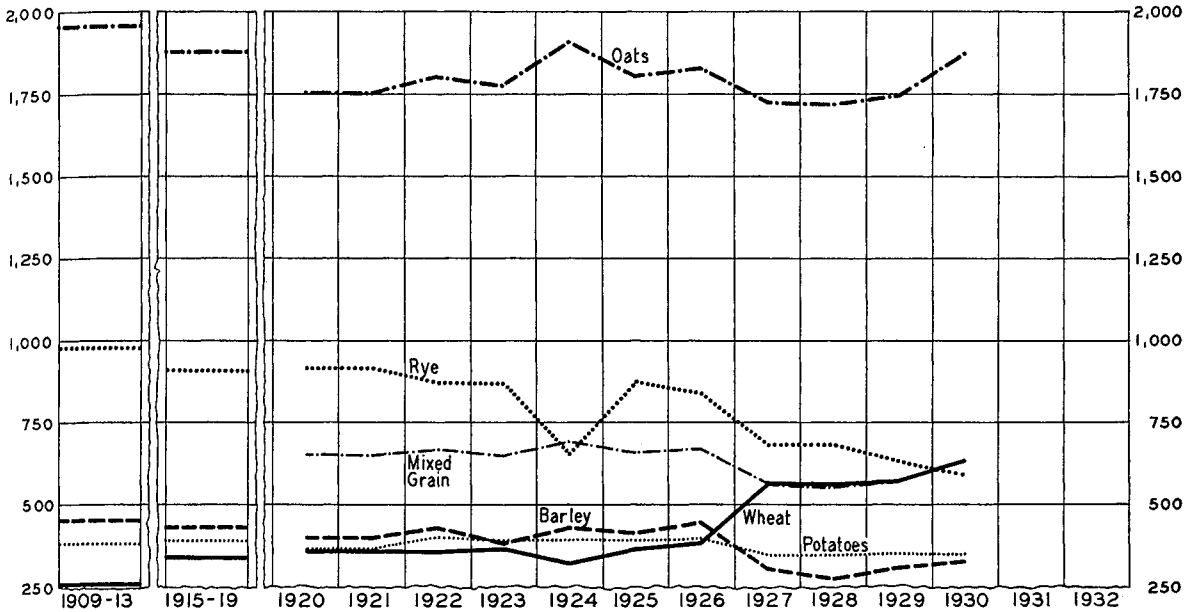
(Billion pounds; million pigs. Logarithmic vertical scale)



* Based upon data in Appendix Tables XVII and XVIII. Data of feed grain utilization not available for 1921–22. For discussion see pp. 376–77.

CHART 12.—UTILIZATION OF LAND IN SWEDEN FOR EACH OF THE MAJOR CEREALS AND FOR POTATOES, PRE-WAR, WAR, AND 1920–30*

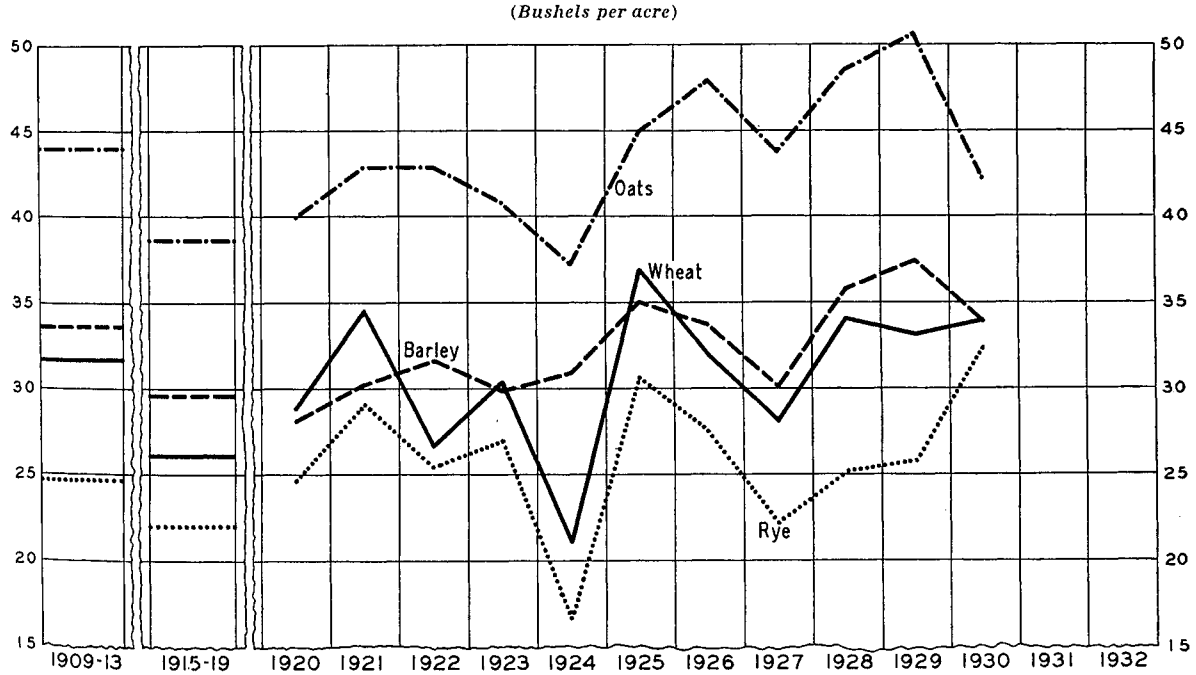
(Thousand acres)



* Based upon data in Appendix Table III. For discussion of chart see p. 378.

CHART 13.—YIELDS PER ACRE OF THE MAJOR CEREALS IN SWEDEN, PRE-WAR, WAR, AND 1920–30*

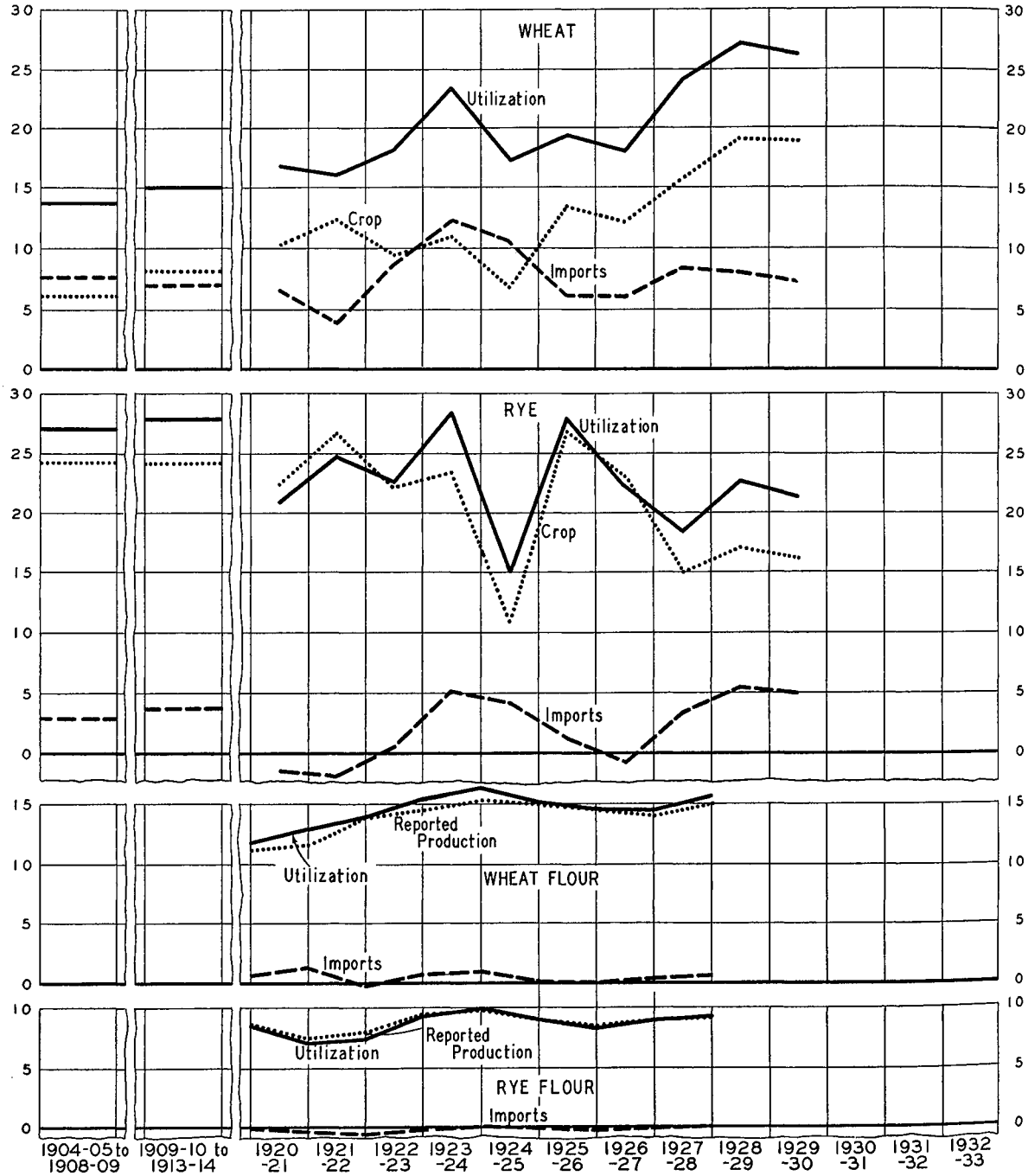
(Bushels per acre)



* Based upon data in Appendix Table III. For discussion of chart see p. 378.

CHART 14.—PRODUCTION, NET IMPORTS, AND DOMESTIC UTILIZATION OF WHEAT AND OF RYE IN SWEDEN, PRE-WAR AND 1920–21 TO 1929–30; AND NET IMPORTS, REPORTED PRODUCTION, AND ESTIMATED UTILIZATION OF WHEAT FLOUR AND OF RYE FLOUR, 1920–28*

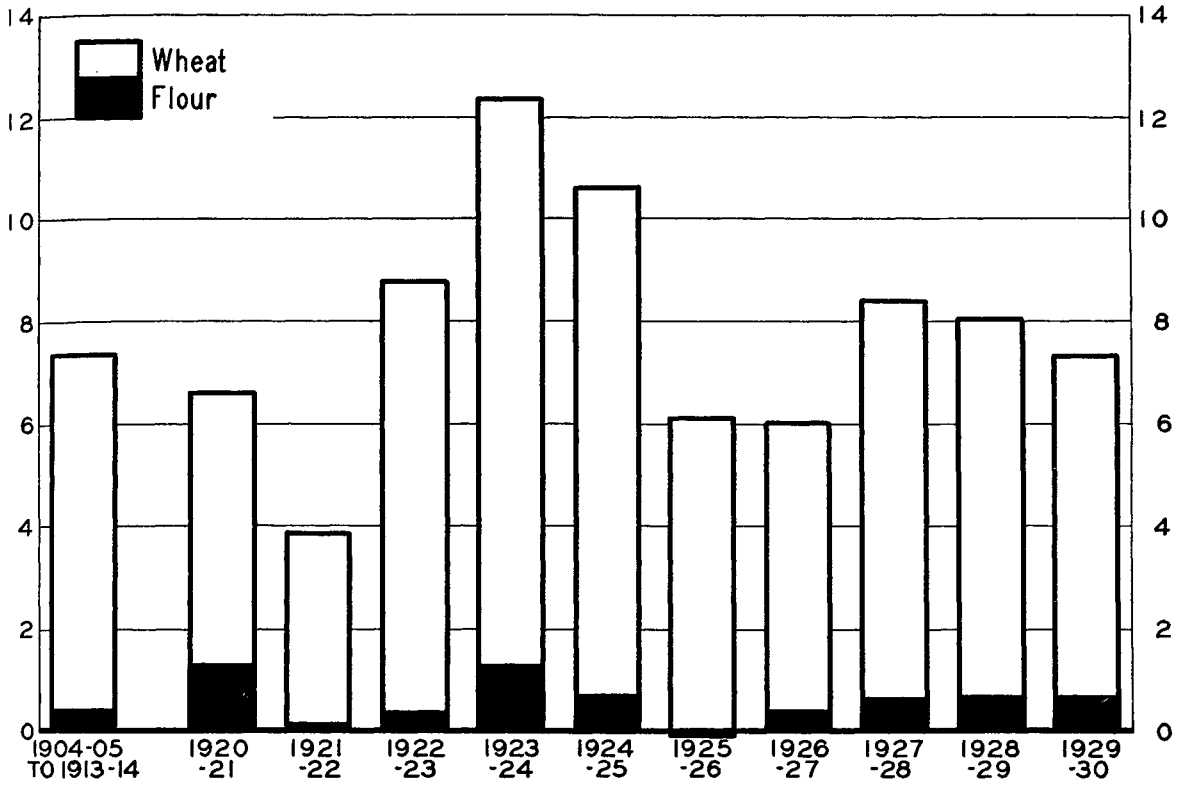
(Million bushels)



* Based upon data in Appendix Tables V and IX. Reported flour production is undoubtedly below total flour production; but there is no basis available for judging how far below. Estimated flour utilization figures represent simply reported production plus net imports. For discussion of chart see pp. 378–80.

CHART 15.—NET IMPORTS OF WHEAT AND OF FLOUR (AS WHEAT) INTO SWEDEN, 1920–21 TO 1929–30, WITH PRE-WAR AVERAGES*

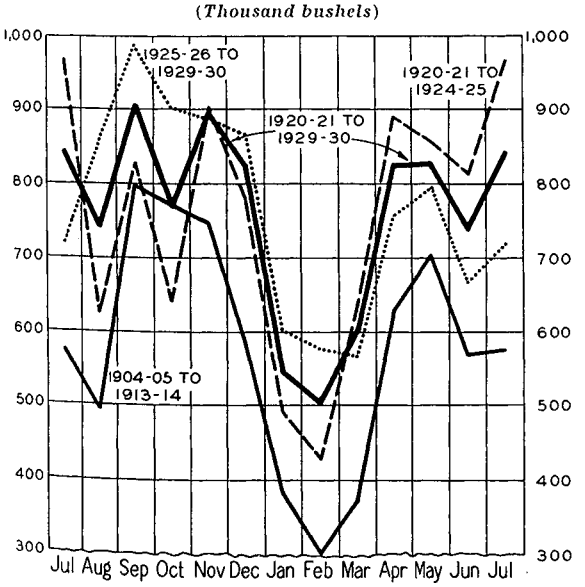
(Million bushels)



* Based upon data in Appendix Table XI. For discussion of chart see pp. 380–81.

CHART 16.—AVERAGE SEASONAL MOVEMENT OF WHEAT AND FLOUR INTO SWEDEN, PRE-WAR AND POST-WAR*

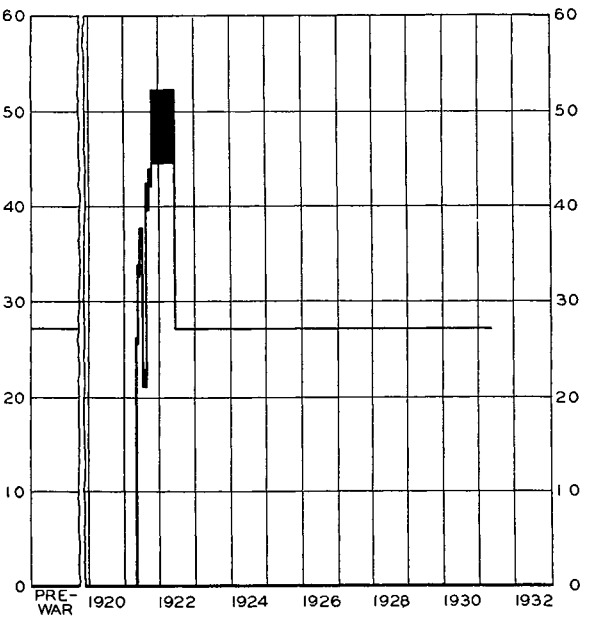
(Thousand bushels)



* Data from Appendix Table XII. Discussion on p. 381.

CHART 17.—SWEDISH IMPORT DUTIES ON WHEAT, PRE-WAR AND 1920–30*

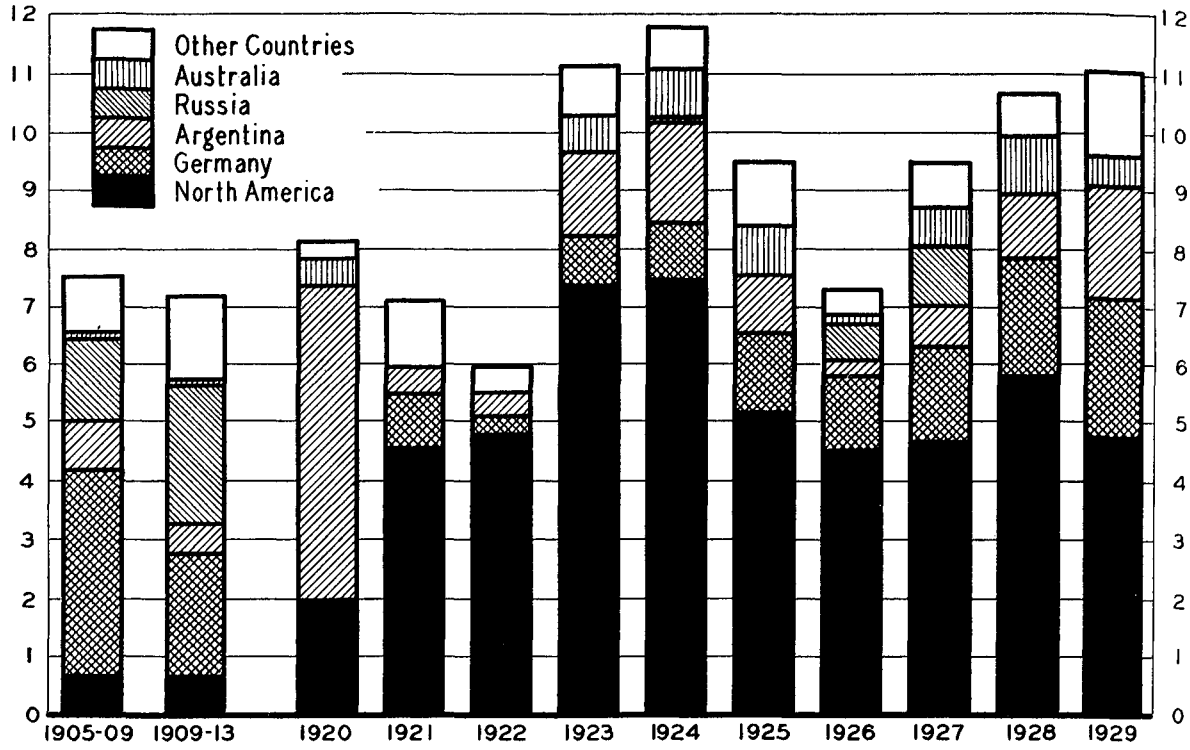
(U.S. cents per bushel)



* Data from Appendix Table X. Discussion on p. 380.

CHART 18.—SWEDISH IMPORTS OF WHEAT AND FLOUR BY SOURCES, 1920–29, WITH PRE-WAR AVERAGES*

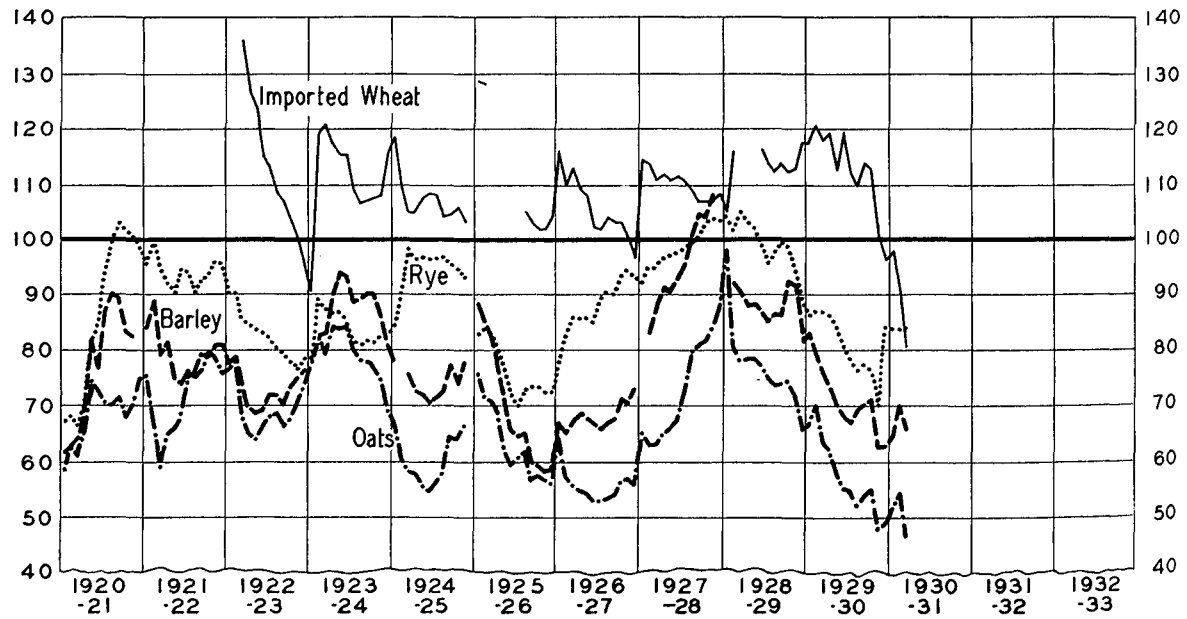
(Million bushels)



* Based upon data in Appendix Table XIII. For discussion of chart see p. 380.

CHART 19.—RATIOS OF CERTAIN CEREAL PRICES TO DOMESTIC WHEAT PRICES IN SWEDEN, MONTHLY, 1920–21 TO 1930–31*

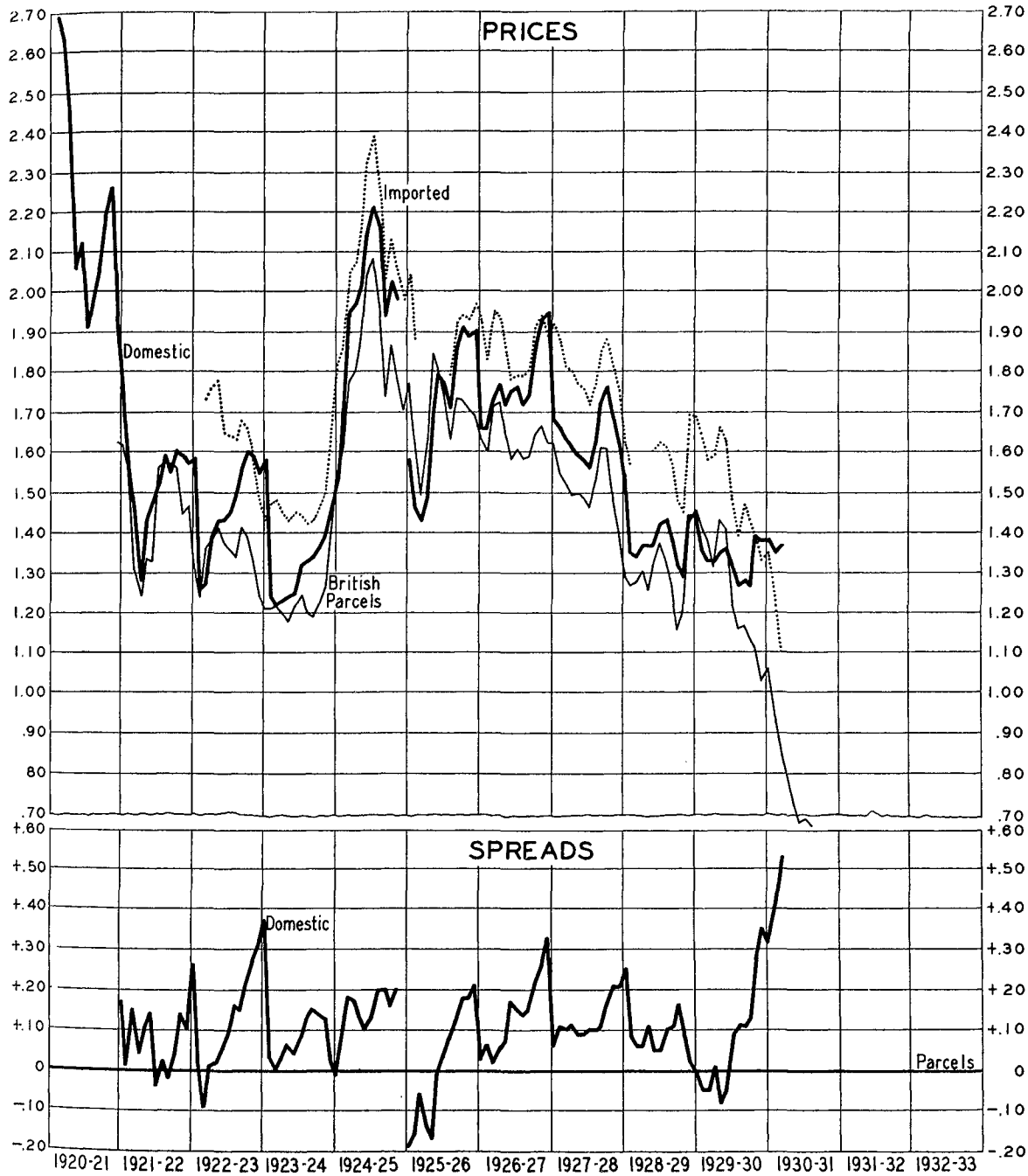
(Percentages)



* Ratios calculated from data in Appendix Table XV. For discussion of chart see pp. 381–83.

CHART 20.—AVERAGE MONTHLY PRICES OF SWEDISH DOMESTIC AND IMPORTED WHEAT AND OF BRITISH WHEAT PARCELS, WITH SPREADS, 1920–21 TO 1930–31*

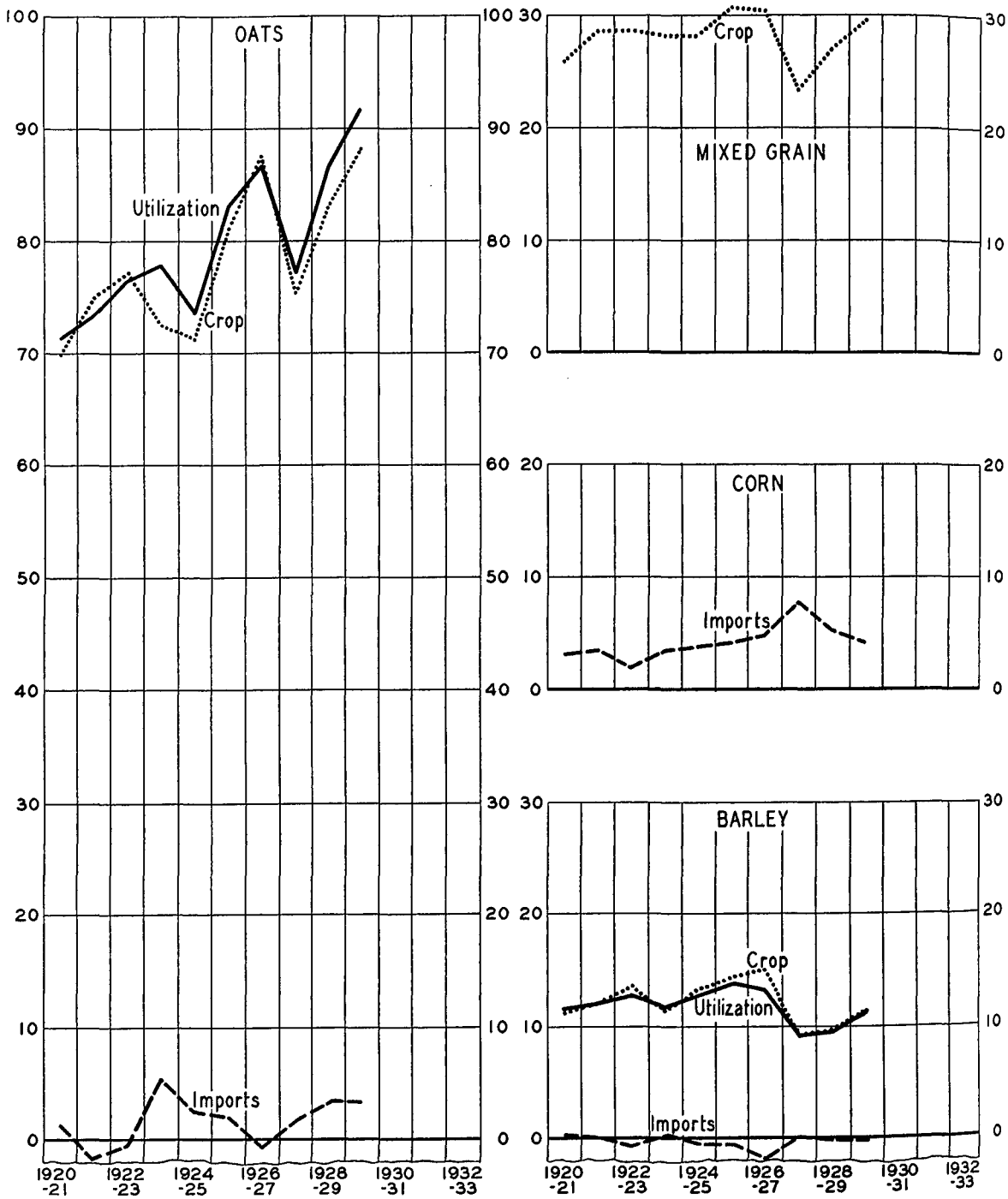
(U.S. dollars per bushel)



* Based partly upon data in Appendix Table XV. British parcels price series explained in WHEAT STUDIES, July 1928, Vol. IV, No. 8. For discussion of chart see p. 382.

CHART 21.—PRODUCTION, NET IMPORTS, AND DOMESTIC UTILIZATION OF OATS, BARLEY, CORN, AND MIXED GRAIN IN SWEDEN, 1920–21 TO 1929–30*

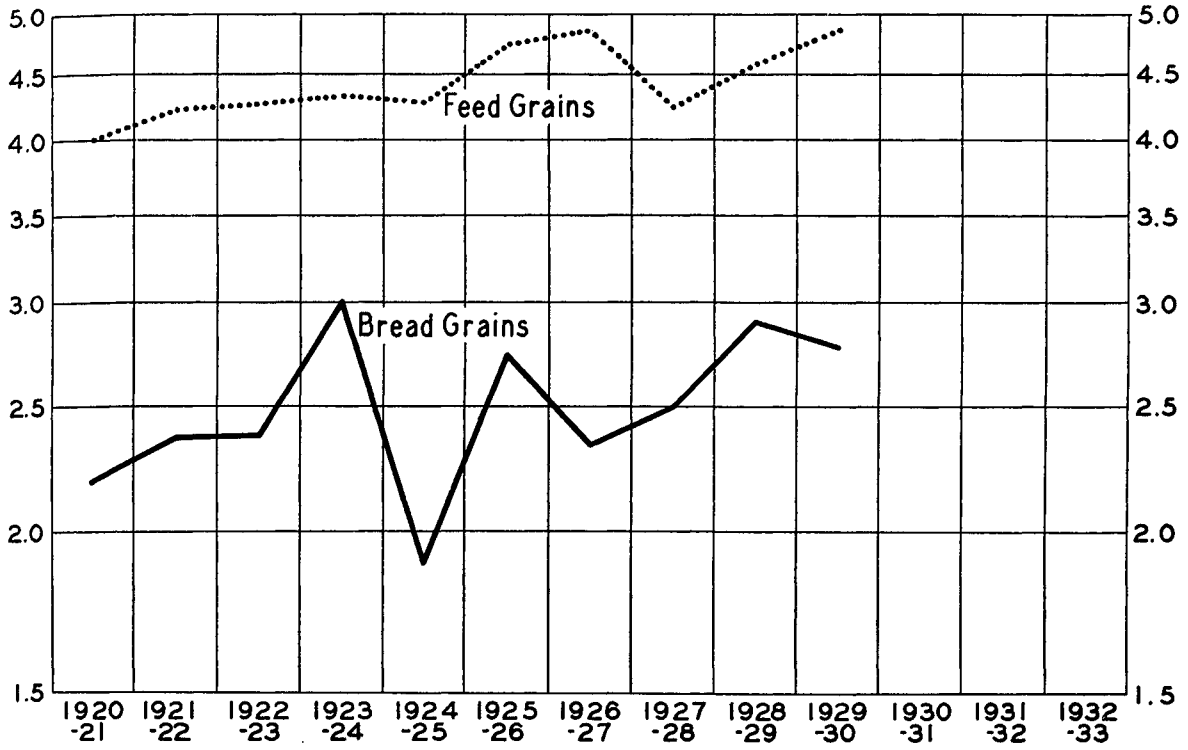
(Million bushels)



* Based upon data in Appendix Tables IV, VII, and XVIII. For discussion of chart see p. 383.

CHART 22.—TOTAL DOMESTIC UTILIZATION OF FEED GRAINS COMPARED WITH TOTAL DOMESTIC UTILIZATION OF BREAD GRAINS IN SWEDEN, 1920–21 TO 1929–30*

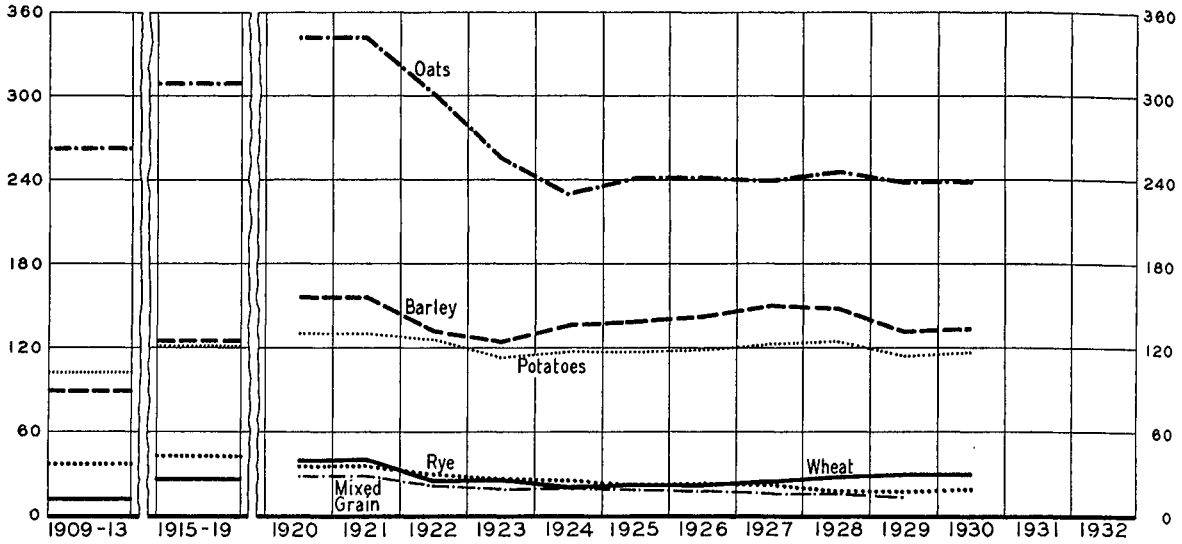
(Billion pounds. Logarithmic vertical scale)



* Based upon data in Appendix Table XVII. For discussion see p. 383.

CHART 23.—UTILIZATION OF LAND IN NORWAY FOR EACH OF THE MAJOR CEREALS AND FOR POTATOES, PRE-WAR, WAR, AND 1920–30*

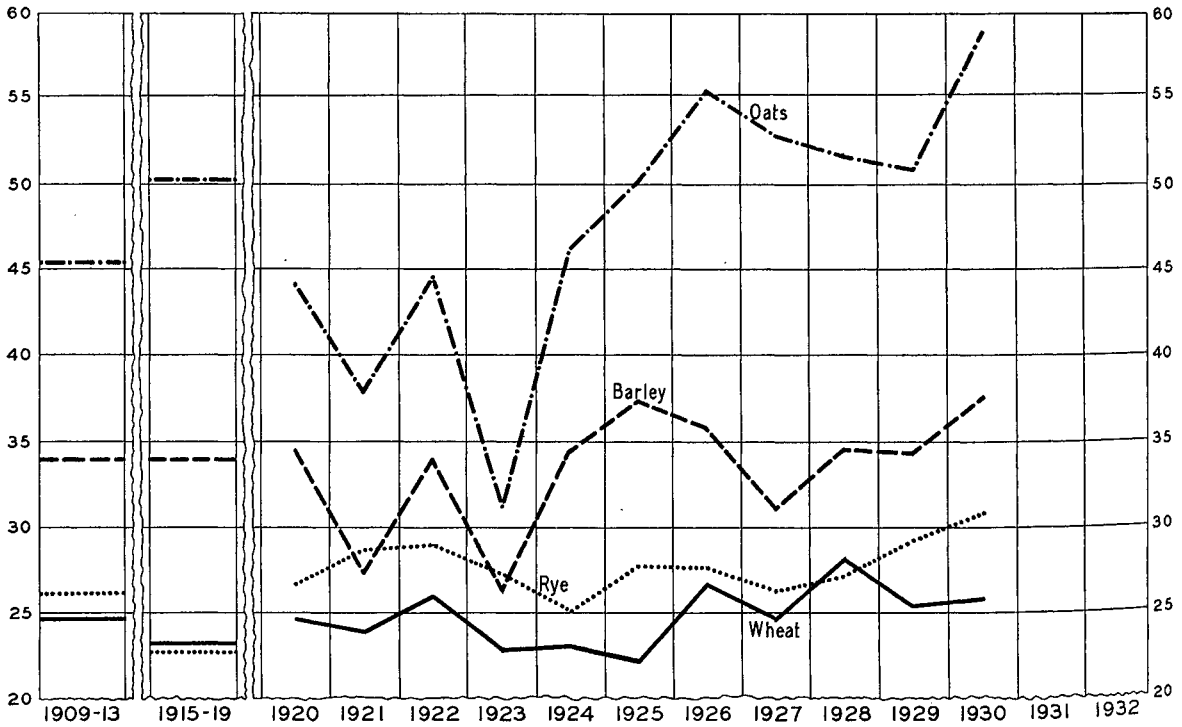
(Thousand acres)



* Based upon data in Appendix Table III. For discussion of chart see p. 384.

CHART 24.—YIELDS PER ACRE OF THE MAJOR CEREALS IN NORWAY, PRE-WAR, WAR, AND 1920–30*

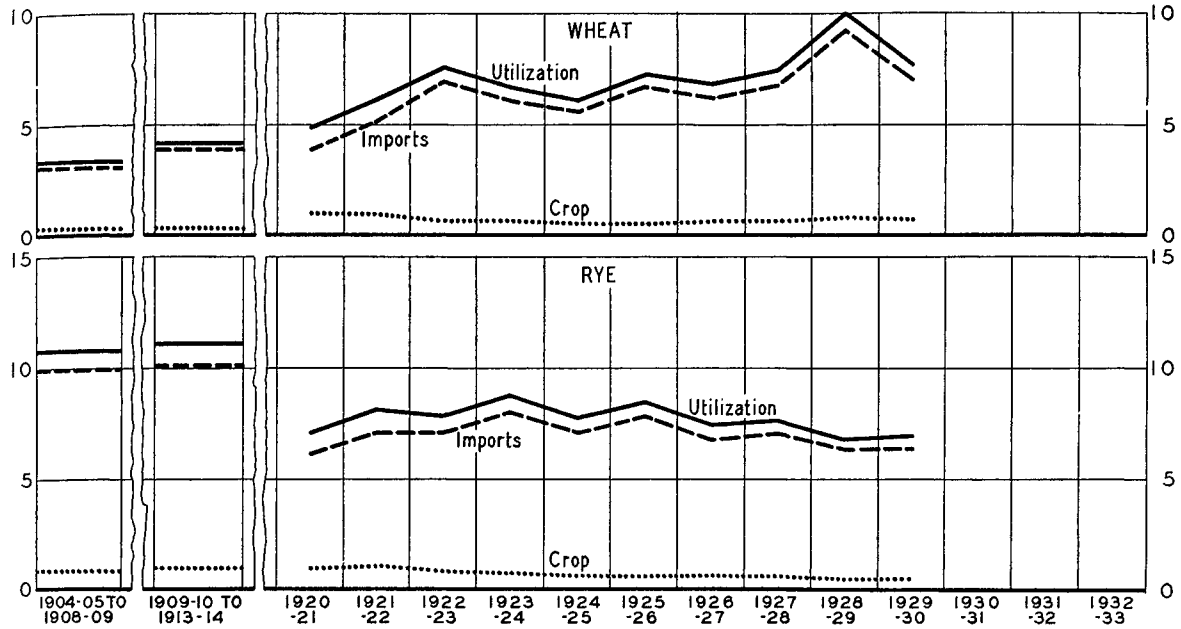
(Bushels per acre)



* Based upon data in Appendix Table III. For discussion of chart see p. 384.

CHART 25.—PRODUCTION, NET IMPORTS, AND DOMESTIC UTILIZATION OF WHEAT AND OF RYE IN NORWAY, PRE-WAR AND 1920–21 TO 1929–30*

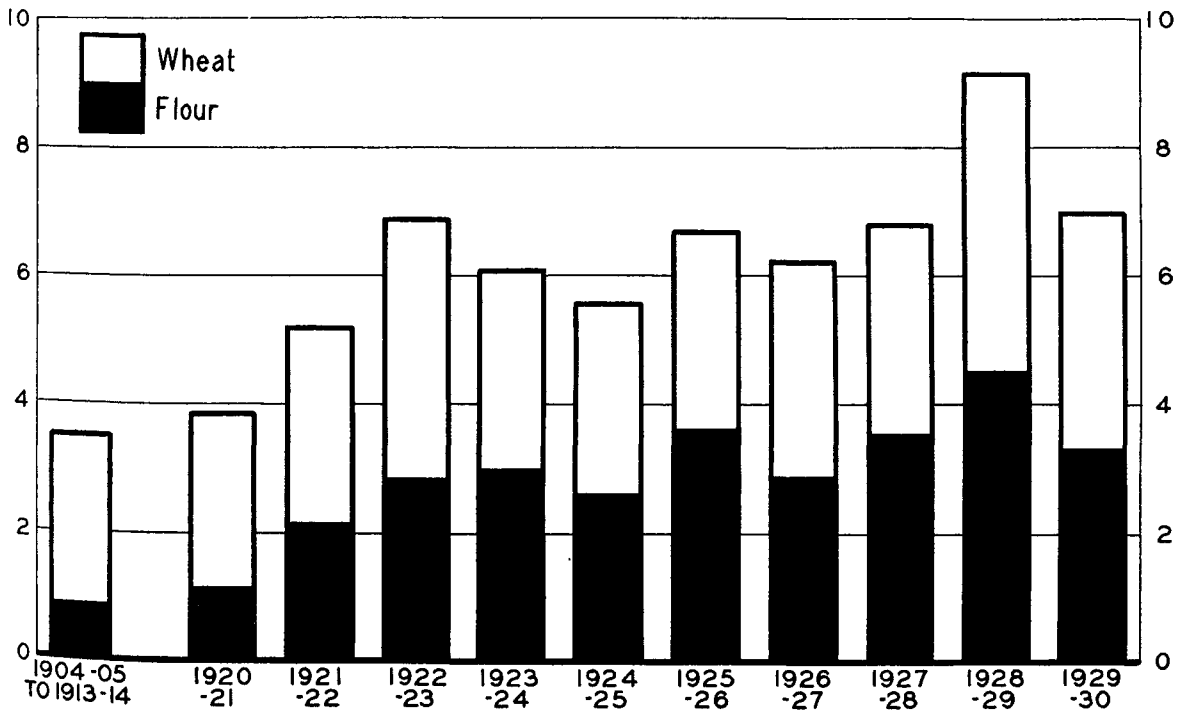
(Million bushels)



* Based upon data in Appendix Table VI. For discussion of chart see pp. 384–85.

CHART 26.—NET IMPORTS OF WHEAT AND OF FLOUR (AS WHEAT) INTO NORWAY, PRE-WAR AND 1920–21 TO 1929–30*

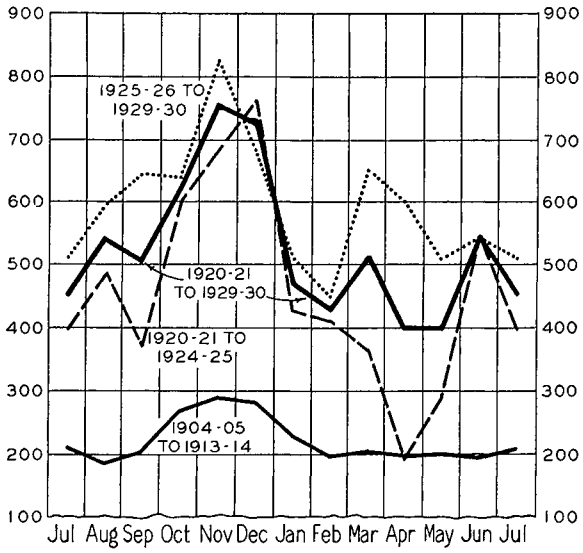
(Million bushels)



* Based upon data in Appendix Table XI. For discussion of chart see pp. 385–86.

CHART 27.—AVERAGE SEASONAL MOVEMENT OF WHEAT AND FLOUR INTO NORWAY, PRE-WAR AND POST-WAR*

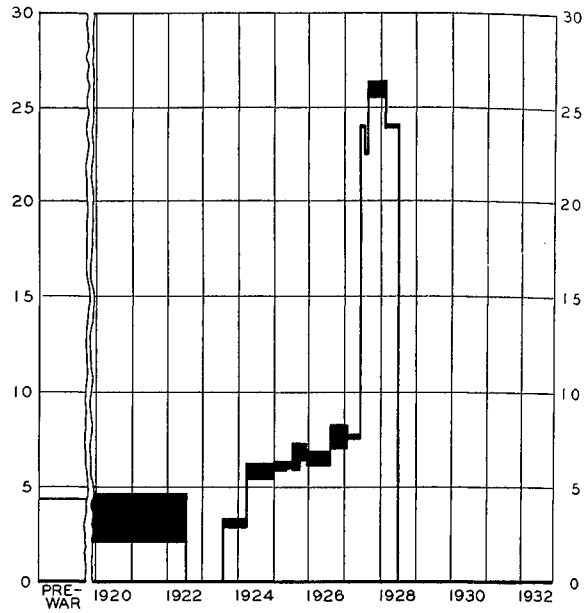
(Thousand bushels)



* Data from Appendix Table XII. Discussion on p. 386.

CHART 28.—NORWEGIAN IMPORT DUTIES ON WHEAT, PRE-WAR AND 1920–30*

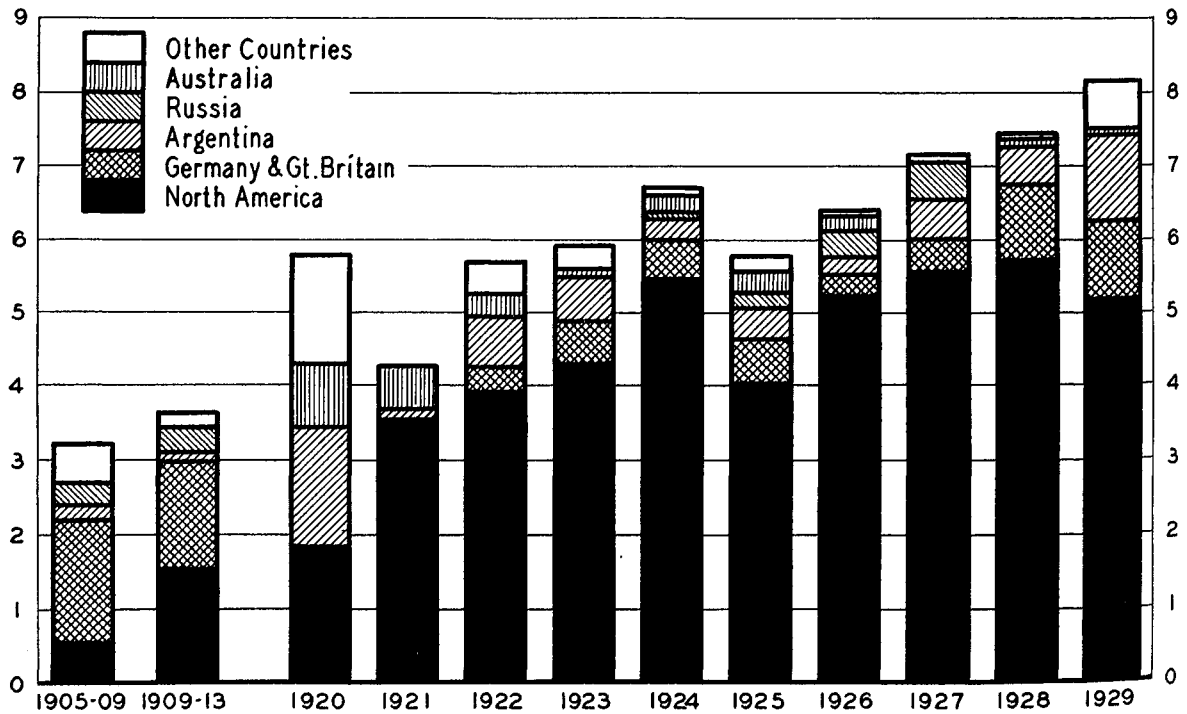
(U.S. cents per bushel)



* Data from Appendix Table X. Wheat admitted free of duty since June 1928. Discussion on pp. 386–88.

CHART 29.—GROSS IMPORTS OF WHEAT AND FLOUR (AS WHEAT) INTO NORWAY, BY PRINCIPAL SOURCES, PRE-WAR AND 1920–29*

(Million bushels)



* Based upon data in Appendix Table XIII. For discussion of chart see p. 385.

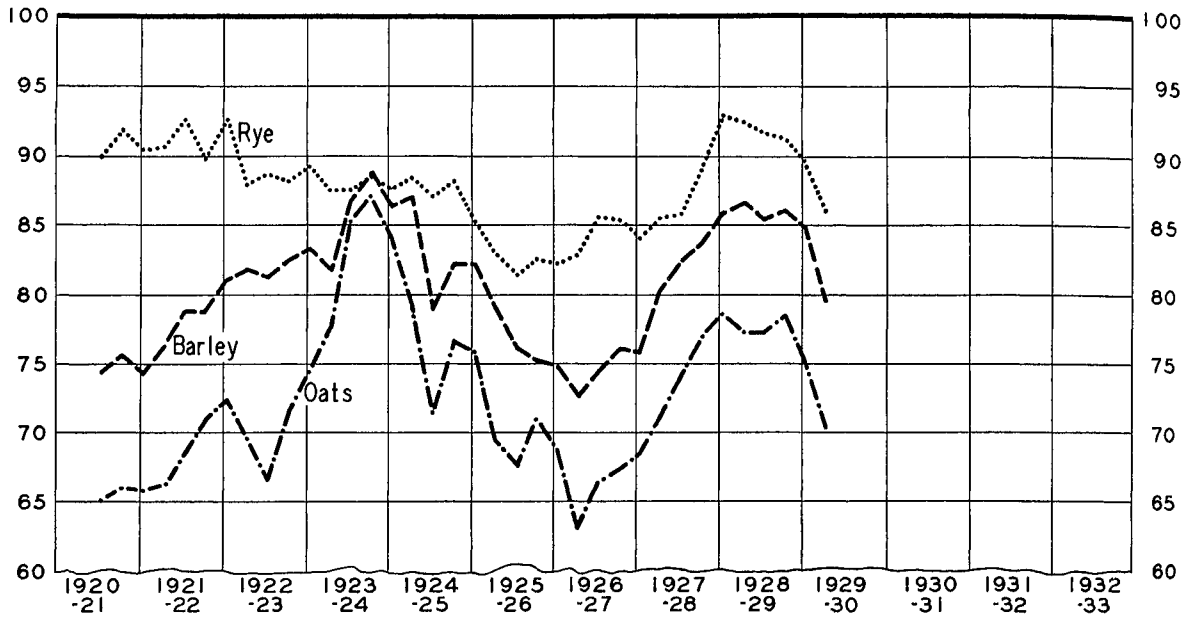
CHART 30.—AVERAGE QUARTERLY PRICES OF NORWEGIAN WHEAT AND OF BRITISH WHEAT PARCELS, WITH SPREADS, 1920–21 TO 1930–31*

(U.S. dollars per bushel)

* Based partly upon data in Appendix Table XVI. British parcels price series explained in WHEAT STUDIES, July 1928, Vol. IV, No. 8. For discussion of chart see pp. 386–88.

CHART 31.—RATIOS OF NORWEGIAN RYE, OATS, AND BARLEY PRICES TO PRICES OF NORWEGIAN WHEAT, QUARTERLY, 1920–21 TO 1929–30*

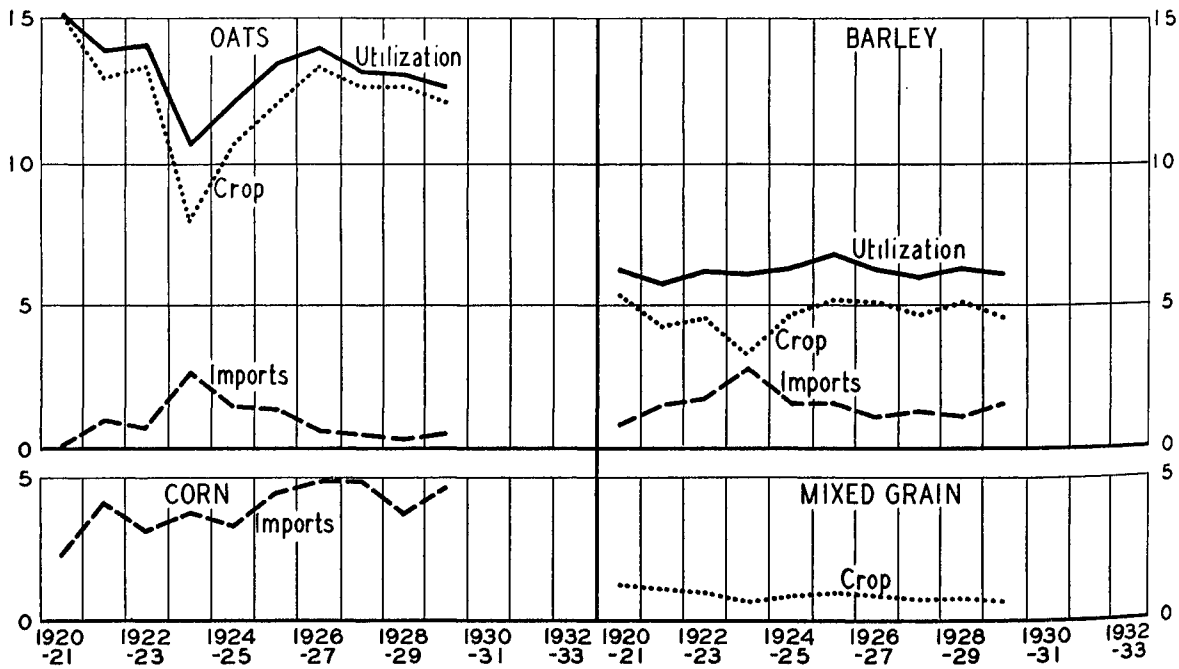
(Percentages)



* Ratios calculated from data in Appendix Table XVI. For discussion of chart see pp. 386 and 388.

CHART 32.—PRODUCTION, NET IMPORTS, AND DOMESTIC UTILIZATION OF OATS, BARLEY, CORN, AND MIXED GRAIN IN NORWAY, 1920–21 TO 1929–30*

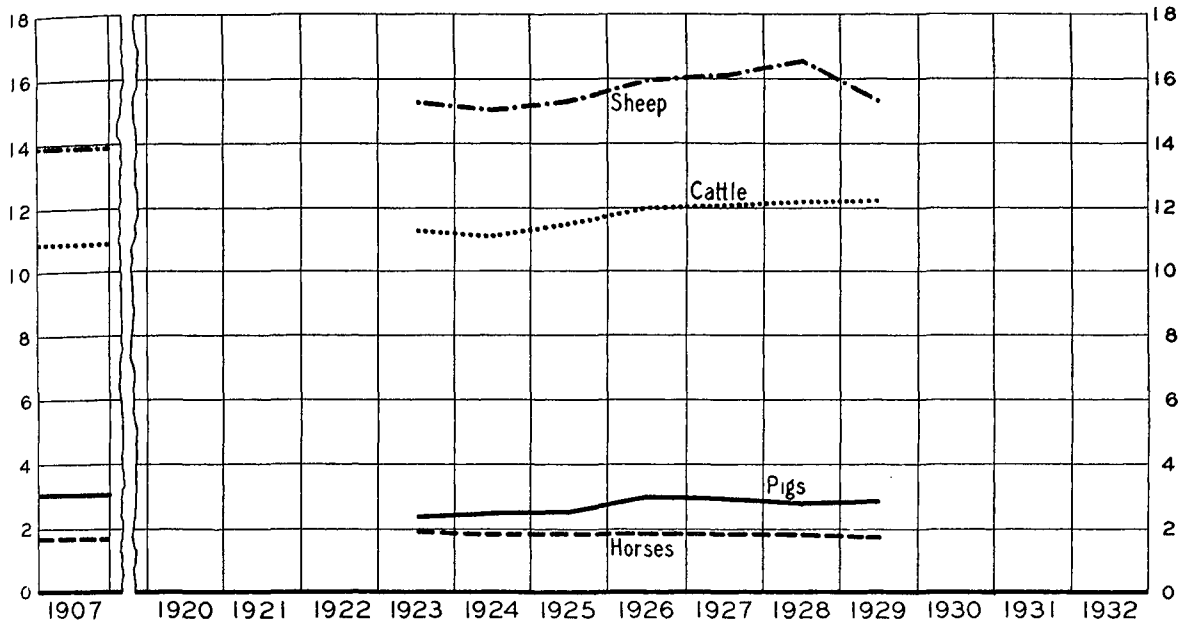
(Million bushels)



* Based upon data in Appendix Tables IV, VII, and XVIII. For discussion of chart see pp. 388–89.

CHART 33.—LIVESTOCK POPULATION IN NORWAY, 1907 AND 1923–29*

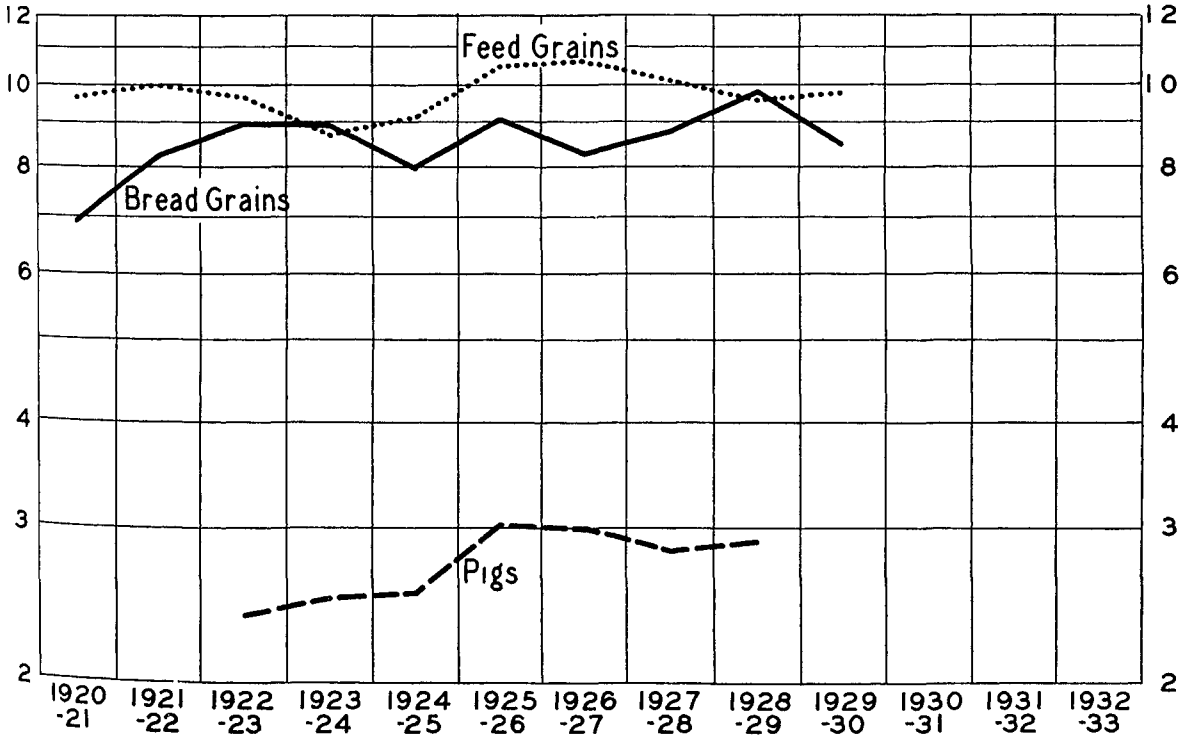
(Hundred thousand head)



* Based upon data in Appendix Table XVII, which also includes data for 1930. For discussion of chart see p. 389.

CHART 34.—TOTAL DOMESTIC UTILIZATION OF FEED GRAINS COMPARED WITH TOTAL DOMESTIC UTILIZATION OF BREAD GRAINS AND THE PIG POPULATION IN NORWAY, 1920–21 TO 1929–30*

(Hundred million pounds, hundred thousand pigs. Logarithmic vertical scale)



* Based upon data in Appendix Tables XVII and XVIII. For discussion see p. 389.

I. DENMARK

Production of Cereals

Denmark is primarily an agricultural country. Approximately 60 per cent of its total area is arable land, which is divided about equally between the cultivation of cereals, on the one hand, and the cultivation of grass, other fodders, and miscellaneous crops, on the other.[1] Another 6 per cent of the total area is made up of permanent meadows and pastures. The proportion of arable and pasture lands is much larger in Denmark than in either of the other Scandinavian countries, a fact probably attributable in the main to the topography, the more southerly geographical position, and the location with reference to the ocean, particularly the Gulf Stream. To some extent, no doubt, agriculture has been favored in Denmark by the small size of land holdings,[2] small independent farms having been directly encouraged for many years by state legislation;[3] but in this respect Denmark does not appear to differ markedly from Norway or Sweden.

Both the total arable land and the area devoted to cereals in Denmark have tended to increase slightly during the past decade.[4] Of the land under cereal crops, by far the larger part is employed for the production of the so-called feed grains. This situation (illustrated in Chart 1, p. 350) probably reflects on the one hand relatively unsatisfactory growing conditions for wheat, and on the other hand an extensive demand for feed grains. Poor soils in numerous localities, excessive rainfall, and severe winter weather tend to encourage the growth of feed rather than bread grains; and the expanding livestock industry of Denmark affords an excellent market for all sorts of feedstuffs.

During the past decade there has been considerable change in the proportions of the cereal acreage devoted to the cultivation of the different kinds of grain. The areas planted to barley, mixed grain,[5] and wheat gradually expanded during the decade, while the areas planted to oats, rye, and potatoes declined (see Chart 1, p. 350). By 1930 barley occupied an area but little smaller than that occupied by oats, the cereal which for many years far outranked all others in acreage. The notable increase in the areas devoted to barley and to mixed grain, and the striking decrease in the oats acreage (changes especially noticeable since 1924), are probably to be partly ascribed to changes in the livestock industry of Denmark—to a decline in the number of horses raised and to increases in the numbers of cattle and pigs. It is perhaps significant, however, that the yield per acre of oats increased so strikingly during the period that the production of oats tended upward despite the decline in acreage. The apparent decline in the oats acreage and the apparent increase in the acreage in mixed grain possibly may have been caused by some change in the method of classifying areas planted to mixed grain; but we have no evidence to show that any change in classification occurred. The area devoted to bread grains, unlike the area in feed grains, tended to decrease during the decade. With the decrease went a marked change in the relative importance of the two bread-grain crops, for the wheat acreage expanded while the rye acreage declined. In 1920 the area occupied by rye was more than three times as large as the

[1] See Appendix Table I.

[2] In 1919 agricultural holdings in Denmark were distributed as follows:

Size of holding	Percentage of total holdings	Percentage of total agricultural area
Under 10 hectares (25 acres)...	53.0	14.5
10–60 hectares (25–150 acres)...	44.4	66.4
Over 60 hectares (150 acres)....	2.6	19.1

[3] The first Danish law granting state aid to small holders was passed in 1899. Since that date a number of other legislative measures favoring small holdings have been passed. Some of the most important of these are briefly summarized in *Report on the Economic Situation of Denmark, 1925,* issued by the Department of Overseas Trade (Great Britain), and in *Denmark, 1926,* published by the Danish Ministry of Foreign Affairs and the Danish Statistical Department.

[4] More precise statements in regard to trends of land utilization seem inadvisable, since the official annual estimates of the areas in arable land, permanent meadows, sown grass, etc., are apparently based upon census investigations which are made at infrequent intervals. The annual estimate for 1929 suggests a marked decrease in land in that year.

[5] In Denmark "mixed grain" refers to a mixture composed of 50 per cent cereals and 50 per cent pulse, or to one composed of 40 per cent barley and 60 per cent oats.

area devoted to wheat; by 1930 the rye acreage was only 50 per cent larger. This change, which took place primarily after 1924, was perhaps partly a result of changes in cereal price relationships (see Chart 7, p. 353). There is no reason to anticipate that wheat may eventually supplant rye throughout Denmark even if price relationships continue to favor the production of wheat. In a number of places rye will continue to be grown because either the soil or the climate makes wheat production unprofitable, while in other places rye probably will be produced because of its place in customary crop rotations. Moreover, in many country districts Danish farmers may continue to raise rye because the small country mills are not equipped for the proper milling of wheat.

With the exception of rye, yields per acre of the various cereals were generally higher after the war than they were on the average during 1909–13 (see Chart 2, p. 350), a situation probably partly attributable to an increased use of fertilizers.[1] The most striking feature of cereal yields in Denmark is the extremely high average yield per acre of wheat, the post-war average being significantly higher than in any other European country with the exception of Holland. In both pre-war and post-war years the average yield per acre of wheat in Denmark was considerably higher than the average yield per acre of rye. While it is not unusual in Europe for wheat yields to average higher than rye yields, the difference between the yields is seldom as large as that shown for Denmark.[2] Rye yields have run consistently lower during post-war than during pre-war years, the pre-war average yield per acre being attained in only one year (1929) of the past decade. This situation does not appear to be readily explicable, although it seems reasonable to believe that some of the better lands devoted to rye cultivation prior to the war were used for raising wheat after 1920. Likewise noteworthy is the fact that annual fluctuations in wheat yields were extremely large, even in percentage terms, as compared with fluctuations in rye yields.[3] Over the period 1920–30 no distinct trend in yield per acre is apparent for either wheat or rye; but marked upward trends are observable in the yields per acre of oats and of barley.

Consumption of Wheat and of Rye

Information concerning the consumption of wheat and of rye in Denmark is scanty. But in spite of the fact that no satisfactory consumption index exists, some light may be thrown on this important subject by a study of annual data of domestic utilization (home production plus net imports or minus net exports), and of data regarding the milling of wheat and of rye.

The domestic utilization data shown in Chart 3 (p. 351) present a picture which may be far from accurate if it be taken to represent the actual yearly domestic consumption of wheat and of rye during post-war years. In the first place, year-end carryovers of wheat and of rye may have varied considerably from year to year, yet such changes cannot appear in the figures of domestic utilization. In 1923–24, for example, the actual consumption of wheat and of rye may have been smaller than the domestic utilization data suggest, for stocks of wheat and of rye may have been unusually large in August 1924. Since no reliable index of Danish grain stocks is available, no exact correction can be made for this lack of correspondence between domestic utilization and domestic consumption.[4] A second important factor which

[1] Danish Ministry of Foreign Affairs and Danish Statistical Department, *Denmark, 1924*, pp. 64–65.

[2] Only in Sweden and Holland do comparable differences exist.

[3] See Appendix Table III.

[4] The major changes in year-end stocks of wheat may perhaps be reflected in the price quotations for Danish wheat recorded at Copenhagen. For example, it appears fairly reasonable to assume that in the crop years when no quotations for Danish wheat were registered at Copenhagen during the last two or more months of the season, stocks of native wheat were running low; whereas in years when quotations were available for every month of the season, stocks of wheat were moderately large. Judged on this basis, stocks of native wheat appear to have been exceptionally small at the end of 1920–21, 1922–23, and 1926–27; but at least of moderate size at the close of 1921–22, 1927–28, 1928–29, and 1929–30. Such a basis for judgment, however, is probably too untrustworthy to be employed without other supporting evidence, and little confirmatory evidence is available in the present instance. Year-end stocks of import wheat might be appraised roughly by the size of net imports towards the end of each crop year; but this method can hardly yield really precise results.

limits the usefulness of domestic utilization figures is the absence of any satisfactory method of separating grain used for human food from that used for animal feed. In spite of these and other limitations upon the usefulness of data of domestic utilization of wheat and of rye, a study of such data for Denmark reveals information of considerable interest.

During the past ten years the average annual domestic utilization of wheat for all purposes (17.0 million bushels) did not differ markedly from the average annual domestic utilization of rye (18.5 million bushels), although on the average the latter grain was used somewhat more extensively. Wheat utilization tended to increase over the period, reflecting increases both in domestic production and in net imports; while the utilization of rye slightly decreased as a result of a decline in domestic production. During most of the years the domestic rye crop represented a larger proportion of the total rye utilization than the wheat crop did of the wheat utilization. If we disregard the first two crop years, which were clearly abnormal because of war influences, domestic wheat production constituted from 42 to 62 per cent of the domestic utilization of wheat, averaging 53 per cent; and the native rye outturn ranged between 49 and 71 per cent of the domestic rye utilization, averaging 62 per cent.

The large annual variations in the domestic utilization of wheat and of rye appear noteworthy, since they appear to have represented, in the main, the concurrence of small crops and small net imports, on the one hand, and the concurrence of large crops and large net imports, on the other. These relationships are especially evident in the case of rye. The large native rye crops available in 1923–24 and 1925–26 did not prevent net imports from being large during those years, while in 1924–25, 1927–28, and 1928–29 net imports of rye as well as domestic rye crops were considerably smaller. In the case of wheat there is less evidence of large crops being related to large net imports, or of small crops being related to small net imports; but such relationships appear to have existed at least during 1924–25 and 1927–28 to 1929–30. These relationships may be mainly explained by reference to import prices. Import prices of rye were relatively low in most of the years when Denmark harvested large rye crops (considering trend), and were relatively high in most of the years when she harvested small rye crops, a situation to be expected in view of the proximity of Denmark to the major supply areas of rye. Since low prices tend to encourage net imports and high prices tend to discourage them, the positive relationship between Danish rye production and annual net imports of rye appears explicable. As regards wheat, positive relationships between net imports and production in 1924–25, 1928–29, and 1929–30 can be explained by the coincidence of large native crops and low import prices in 1928–29 and 1929–30; and by the coincidence of a small domestic outturn and high import prices in 1924–25.

In spite of the fact that there is ample evidence of a non-statistical nature to indicate that in Denmark rye and wheat are mutually substitutable (on a moderate scale) for both food and feed, little direct evidence of substitution appears in the utilization data, at least prior to 1928 (see Chart 3, p. 351).[1] Moreover, since inferior wheat and rye are used extensively for feed purposes, we may feel reasonably confident that there is some substitution of rye and of wheat for the various feed grains. But again positive statistical evidence seems to be lacking.[2]

The large annual fluctuations in the domestic utilization of wheat and of rye suggest that unless carryovers varied markedly from year to year, large and variable quantities of each of these grains must have been used as animal feed during the past decade, for in no country for which reasonably complete and accurate milling data are available do marked fluctuations appear in the annual consumption of rye and wheat for human food. Statements of persons familiar with the feeding practices of Danish farmers, information concerning the characteristics of Danish wheat, and

[1] In this statement the first two post-war years are disregarded, as the utilization of both grains was abnormally low in those years.

[2] See p. 377 for a further discussion of this problem.

fragmentary data concerning the quantities of wheat and rye flour milled in, and imported (net) into, Denmark all point to the conclusion that wheat and rye are extensively fed, especially in years when the price of wheat or of rye is unusually low relative to the prices of feed grains. In a report to the United States Department of Agriculture on European milling and baking practices, C. O. Swanson stated that "most of the native wheat grown in Denmark is used for livestock and very little is used for bread making."[1] A somewhat similar statement appears in the Danish yearbook for 1926.[2] The character of Danish wheat accounts in the main for the large quantities normally fed. The varieties most commonly grown in Denmark are soft red winter wheats of low protein content[3] which must be combined with strong wheat from other countries to produce a flour satisfactory to bakers.[4]

Available data of flour production, and of flour net imports (also presented in Chart 3, p. 351), throw some further light upon the problem of consumption. Great care must be exercised, however, in interpreting the resulting estimates of flour consumption because of the nature of the milling data used.[5] For example, one may not safely conclude on the basis of such data that the consumption of wheat for human food generally exceeded that of rye. In fact, it seems probable that if there was any significant difference in the amounts of wheat and rye used for food, the difference was in favor of rye rather than of wheat. Regarding the use of wheat and of rye for bread, the Danish yearbooks of 1924–1927 contain the statement that "rye and wheat were utilized in almost equal quantities as bread grain."[6] If this be a fair statement of the proportions of wheat and of rye used for bread-making, we may conclude that approximately the same proportions probably held for the total human consumption of wheat and rye, since apparently little wheat or rye is normally used for human food in forms other than bread. But in spite of the difficulties involved in interpreting the data presented in Chart 3, one important fact stands out clearly. The yearly fluctuations in wheat and rye flour consumption were strikingly small both in absolute and in percentage terms as compared with yearly fluctuations in the total domestic utilization of wheat and of rye. Thus, in Denmark, as in the other countries for which milling data are available, it appears that the human consumption of wheat and of rye is relatively stable from year to year; and that any large fluctuations which occur in the domestic utilization of the major bread grains represent either changes in year-end carryovers or changes in the amount of rye or of wheat used for feeding purposes.

[1] Swanson, C. O., "European Milling and Baking Practices and Demand for U.S. Flour" in *Modern Miller*, January 24, 1931.

[2] "Sufficient quantities [of rye and wheat] are grown for the country's supplies, but under normal conditions a large part of the crops is used for fodder and is replaced by foreign corn and flour for food." Danish Ministry of Foreign Affairs and Danish Statistical Department, *Denmark, 1927*, p. 64. "Corn" is apparently used here in the European sense to mean "grain."

[3] Much detailed information about the growing of wheat in Denmark is presented by Dr. Girolamo Azzi in a publication of the International Institute of Agriculture, *Le climat du blé dans le monde*, pp. 441–54.

[4] Tests of the milling and baking qualities of several Danish wheats are reported in a recent publication of the United States Department of Agriculture, *Milling and Baking Qualities of World Wheats*, pp. 109–10.

[5] See Appendix Table VIII. It has been officially stated that the reported production of wheat flour represents about 97 per cent of the wheat flour produced in merchant mills and that the reported production of rye flour represents about 80 per cent of the rye flour produced in merchant mills; moreover, the quantities of flour manufactured in custom mills were stated to be insignificant. Since it is generally known that custom mills are numerous in Denmark, and that such mills engage extensively in grinding rye meal for human consumption as well as in crushing rye for feed, it is difficult to understand the official statement that the amount of flour produced in custom mills is insignificant, unless one assumes that coarse rye meal (often used for bread-making) does not come under the category of "rye flour." This may or may not be a proper interpretation of the figures. Certain it is, however, that if "rye flour" is interpreted to include rye meal, the estimates of total rye flour production (based on the assumption that the official figures represent 80 per cent of the total) fall considerably short of what appear to be reasonable figures; whereas the estimates of total wheat flour production (based on the assumption that the official figures represent 97 per cent of the total) appear fairly reasonable.

[6] The statement probably referred to quantities of weight rather than volume. Since no data were presented to support the statement, we must note that it may have been based upon nothing more than the official figures of flour production which appear in Appendix Table VIII. Consequently, the significance of the comment is open to question.

Trade in Wheat and Wheat Flour

The characteristics of Danish wheat are such that strong foreign wheats are in great demand for milling purposes; as a result, the high protein wheats from North America have been among the most popular imported into Denmark (see Chart 6, p. 353). Before the war Denmark bought more wheat from Germany than from any other country, the purchases representing not German wheat, but probably mainly wheat from North America. Many of the trade relationships between Denmark and Germany were broken down during the war; consequently, after the war Danish importers and millers bought less wheat from Germany, and considerably more wheat directly from the countries of origin—from North America and Argentina. Data concerning the various origins of the wheat imported from Germany prior to the war are not available; and without that information it is impossible to determine whether any important changes occurred between 1905 and 1929 in the relative amounts of North American and Argentine wheats consumed in Denmark. There is probably little reason to doubt that the consumption of Russian wheat declined over the period, for in recent years, with the exception of 1930–31, Russia has not had large quantities of wheat available for export.

About one-third of the wheat (including flour) imported net into Denmark during post-war years arrived in the form of flour (see Chart 4, p. 352). Annual ratios of net imports of wheat flour to total net imports of wheat and flour combined averaged 39 per cent for the entire period 1920–21 to 1929–30; for individual years the ratios ranged between 14 per cent in 1924–25 and 65 per cent in 1921–22, but generally (in seven years) they were confined to a narrower range, 22 to 44 per cent.

Imported flour appears generally to constitute around 30 to 40 per cent of the total annual consumption of wheat flour,[1] though at least one investigator has reported that imported flour represents a much higher percentage of the total.[2] Between 80 and 90 per cent of the flour imports of Denmark are usually purchased directly from the United States and Canada; thus North American flours are more widely preferred in Denmark in comparison with other imported flours, than are North American wheats in comparison with other imported wheats. This is an additional bit of evidence to suggest that Denmark frequently imports wheat for feeding purposes.

Variations in the annual net imports of wheat (including flour) were strikingly large during the past decade. Net imports in 1928–29, for example, were over 48 times as large as the net imports of 1920–21,[3] and even 3 times as large as those of 1925–26, which were the smallest if we disregard the first two years of the decade. In Denmark, none of the large annual variations in total net imports can be attributed in whole or in part to tariff changes, since imports of both wheat and wheat flour were admitted free of duty during the period under consideration. A fairly satisfactory explanation may be found in the price situation alone. Three years of the past decade were outstanding as years of large net imports of wheat (including flour)—1923–24, 1927–28, and 1928–29. In all three of these years the price relationships between wheat on the one hand, and barley, oats, and corn on the other hand, appear to have favored the feeding of wheat (see Chart 7, p. 353). The large wheat imports of 1928–29, almost 6 million bushels larger than the net imports of any other season, probably represented exceptionally heavy purchases of low-grade Canadian wheat (unusually abundant in that year) for feeding purposes. Aside from 1920–21 and 1921–22, years in which so many abnormal influences were operating that it does not appear profitable to consider them, none of the post-war years witnessed notably small net imports. In 1925–26, however, net imports were somewhat small as compared with other post-war years, in spite of a marked rise in the value of the Danish krone. Presumably

[1] See Appendix Table VIII.

[2] C. O. Swanson has stated that "it is estimated that the Danish flour mills manufacture 35 to 45 per cent of the flour consumed in Denmark" (*Modern Miller*, January 24, 1931, p. 20). This estimate appears to us to be too low in view of the official data of flour production and of net imports.

[3] The year 1920–21 was distinctly abnormal from the standpoint of trade, since private imports of wheat and flour were prohibited by the government (*Commercial Intelligence Journal*, February 18, 1922, p. 245).

wheat imports were discouraged that year by the existence of strikingly large price-spreads between wheat on the one hand, and rye and the feed grains on the other hand.

Seasonal as well as yearly fluctuations in imports are of considerable significance. Average monthly imports for the period 1920–21 to 1929–30 (see Chart 5, p. 352) indicate that imports are typically small in July and August, that they rise to a peak in November or December from which they decline to a low point in one of the mid-winter months, usually February; and that they finally increase again in the spring, being decidedly large during April–June. Naturally all years have not been "typical" as regards the monthly distribution of imports. Nevertheless, when monthly imports of individual years are compared with the ten-year average .seasonal movement, it appears that the ten-year average is fairly representative of a true underlying seasonal tendency.[1] The heavy movement of imported wheat to Denmark in the fall months probably represents mainly an accumulation of new-crop wheat from North America. Since North American exports fall off during the mid-winter months, and since ice-breakers occasionally have to be employed to gain entrance to Copenhagen during the coldest portion of the winter, there is naturally a falling off in Danish imports during January and February. Large imports are encouraged in April–June by the freer shipment of wheat from North America and Argentina, and by the seasonal increase in Danish native wheat prices relative to imported wheat prices.[2] During July and August millers and importers in Denmark no doubt attempt to reduce their stocks of both native and foreign wheats in preparation for new-crop supplies. But it is not clear to what extent this constitutes an adequate explanation of the small imports of those two months.

Cereal Prices

Prices of Danish wheat are more closely related to the prices of British wheat parcels than are the wheat prices of most other European countries (see Chart 8, p. 354), because Denmark requires much foreign wheat, and like Great Britain, admits foreign wheat free of duty.

Generally Danish domestic wheat prices rule below British parcels prices. Only during the closing months of a crop season does it appear normal for the price of Danish wheat to exceed the price of wheat imported into Great Britain (see price-spreads in Chart 8, p. 354). In fact, in only one year, 1930–31, did Danish wheat prices rule above British parcels prices during any of the months from September to March; whereas in all (nine) of the years the Danish prices stood at a premium during at least one of the months from April to August. Thus, there appears to be a recurrent seasonal tendency in the movement of Danish wheat prices. A similar seasonal tendency exists in many other European countries, and probably can be explained at least in part on the ground that most native European wheats contain more moisture than imported wheats and, as a result, deteriorate more readily.[3] Generally the native wheats are kept in good condition only with difficulty during the later months of a crop season; hence the costs of carrying the wheat are high.

Apparently some relationship (though it may be slight) exists between the size of Danish wheat production and the time of the year when Danish wheat prices first rise to a premium above British parcels. In the three post-war years of largest native wheat crops, 1921–22, 1928–29, and 1929–30, Danish wheat rose to a premium later in the season than it did in two of the years of distinctly short crops, 1923–24 and 1924–25. That the relationship is by no means a precise one, however, may be seen from a comparison of the years 1921–22 and 1926–27. In spite of the fact that a large native wheat crop was harvested in 1921 and a decidedly small one harvested in 1926, Danish wheat rose to a premium in the month of May both in 1922 and in 1927. Indexes of crop quality might throw further light on this subject; but no such indexes are available.

Price ratios (at Copenhagen) between Danish wheat on the one hand, and Danish

[1] See Appendix Table XII.

[2] See Chart 8, p. 354.

[3] Perhaps established practices of marketing, storing, and trading in wheat futures are of significance.

rye, Danish barley, Danish oats, and La Plata corn on the other hand, suggest that wheat might profitably have been substituted for rye in 1921–22, 1928–29, and probably 1927–28, and for the feed grains in 1923–24, 1927–28, and 1928–29 (see Chart 7, p. 353). The evidence is less clear for other years. Normally moderate quantities of poor quality wheat, often designated as feed wheat, are fed to animals, but wheat of good milling quality can be profitably fed only at relatively infrequent intervals.

Feed Grains and the Livestock Industry

No study of the wheat production and consumption of Denmark would be complete without some discussion of the livestock industry and of the production and utilization of feed grains, for Denmark ranks as one of the foremost European exporters of animals and animal products.

Domestic production supplied slightly over 95 per cent of the barley and of the oats utilized in Denmark in most of the post-war years, although on occasions imports of these grains were quite heavy (see Chart 9, p. 355). It is interesting to note that large imports of barley and oats appear to have been related more closely to low prices than to small crops of those grains. Thus, the largest net imports of oats occurred in 1923–24 and 1929–30, and the largest net imports of barley occurred in 1922–23, 1923–24, and 1929–30—years of low prices for those cereals, and years when native supplies were of moderate size or larger (trends considered). In the two years when corn was imported most heavily, 1926–27 and 1927–28, corn prices were distinctly low in relation to the prices of other feed grains, and, furthermore, the supplies of the other grains were relatively small.

The large annual fluctuations in the domestic utilization of feed grains in Denmark suggest that fairly large annual fluctuations may have occurred in the livestock population of that country during the period under consideration. But this assumption appears to hold only with respect to the number of pigs; no pronounced annual fluctuations occurred in the numbers of cattle, horses, or sheep (see Chart 10, p. 356). The numbers of horses and sheep have declined more or less steadily since the war, while the number of cattle has increased fairly continuously. The decline in the horse population is presumably largely attributable to a smaller export demand for horses (particularly the smaller demand of Germany), and by some substitution of machine-power for horse-power within Denmark itself. The increase in cattle represents primarily a re-establishment, and a gradual expansion, of the dairying industry, an industry which was of considerable importance before the war. In fact, not until 1925 at least, and probably not until 1926, was the number of cattle in Denmark equal to the number within the same boundaries in 1914.[1]

Since the pig population was the only portion of the livestock population which fluctuated markedly during post-war years, it seems worth while to question whether any more or less definite relationship existed between annual fluctuations in the number of pigs and annual fluctuations in the available supplies of feed grains and of bread grains. Unfortunately, no thoroughly satisfactory method exists for reducing the various grains to common units of supply; but for present purposes it appears moderately satisfactory to consider grain supplies in terms of units of weight. While it is difficult, if not impossible, to determine a proper trend either for the pig population or for grain supplies, certain facts appear more or less clear from Chart 11 (p. 356). The pig population was large (trend considered) in July 1923, 1924, 1927, and 1930. In two of these years, 1923–24 and 1929–30, feed grain supplies were notably large (trend considered), while bread grain supplies were large and of moderate size respectively; and in two of the years, 1922–23 and 1926–27, feed grain supplies were of moderate size, while bread grain supplies were about in line with trend in the former year and below trend in the latter. The pig population was relatively small, on the other hand, in July 1925 and 1928, as well as in the immediate post-war years. Of the two years 1924–25 and 1927–28, the former

[1] In 1920 the number of cattle within the new boundaries was 2,504,000, those within the old boundaries 2,286,000. See Appendix Table XVII.

was characterized by moderately large supplies of the feed grains, and strikingly small supplies of the bread grains, while the latter was characterized by moderately low supplies of the feed grains and fair-sized supplies of wheat and rye. Thus, there may be said to be some, but no definitive evidence of a small positive correlation between changes in the number of pigs and changes in the supplies of feed and bread grains.

Another problem upon which Chart 11 may perhaps throw some light is that of the substitution of wheat and rye for the feed grains. Neglecting the post-war years prior to 1922–23, and assuming that carry-overs did not vary greatly during the period, one may say that bread grain supplies were probably above normal in four years —1922–23, 1923–24, 1925–26, and 1928–29. In only one of these years, 1925–26, did feed grain supplies fall below trend; but in one other, 1922–23, feed grain supplies were only of moderate size (trend considered), while the pig population was above trend. Thus, on the basis of supplies alone, it seems reasonable to believe that the bread grains may have been fed in unusually large quantities at least in 1922–23 and 1925–26. Price relationships favored the feeding of wheat at least in 1927–28 and 1928–29, and perhaps in 1923–24; and price relationships apparently favored the feeding of rye at least in 1923–24, 1925–26, and 1929–30. Moreover, the available price data probably do not reflect supply changes which were confined solely to the lower grades of wheat and rye, yet such changes presumably resulted in changes in the feeding of the bread grains.

II. SWEDEN

Production of Cereals

Extending from 55° 20′ to 69° north latitude, Sweden is a land of varied climate, and of various degrees of agricultural development. The Gulf Stream has an important influence upon the climate of southern Sweden: the mean annual temperature is appreciably higher and the range of temperatures narrower than in the northern part of the Canadian wheat belt, which lies within the same parallels of latitude. But the Stream has little influence upon the climate of northern Sweden, since the high mountain ranges on the west shut out the warm westerly winds. Most parts of northern Sweden are too cold or too mountainous, or have too short a growing season, for the profitable cultivation of agricultural crops other than grass. Practically no wheat is raised north of the sixty-second parallel; and near that northern limit wheat is often left in the ground two summers in succession. Rye is grown somewhat farther north than wheat; but in northern Norrland, where farmers can count on only about 72 frostless days out of a year, barley is the sole cereal crop.[1] Even in southern Sweden agriculture is handicapped by weather conditions; the monthly distribution of rainfall and, in the extreme south, late spring frosts are two notably unfavorable factors.[2] When spring rains are needed in April and May the precipitation is often too light; when favorable harvest weather is desired in July and August, the rainfall is frequently excessive.

Of the total land area of Sweden only about 10 per cent is arable.[3] This average percentage is greatly exceeded in the southern sections but by no means equaled in the northern sections. In Skane the cultivated area amounts to about 80 per cent, and in other lowlands of the south to about 40 per cent, while in Norrbotten it represents less than 0.5 per cent. Slightly over 3 per cent of the total area is in permanent meadows, and over 50 per cent is in forests and pastures. For the country as a whole, the arable land is used in almost equal proportions for sown grass (45 per cent) and for cereals (42 per cent), with miscellaneous crops and bare fallow amounting to about 13 per cent.

In Sweden, as in Denmark, small farms predominate. In fact, farms of 25 acres or less represent a larger proportion of all

[1] René Musset, *Le blé dans le monde*, p. 30.

[2] The late spring frosts are especially harmful to rye.

[3] See Appendix Table I.

farms, and of the total agricultural land, in Sweden than they do in Denmark.[1]

Oats is the major cereal crop in Sweden, as in the other two Scandinavian countries (see Chart 12, p. 357), the cool, wet weather of Scandinavia being almost ideal for the raising of oats. It is notable that since 1901, at least, in Sweden oats consistently occupied an acreage about twice as large as that devoted to any other grain. During the first twenty-nine years of the present century rye ranked second in importance among Swedish grains, judged from the standpoint of acreage; but in 1930 wheat rose to second rank. The relatively small acreage devoted to barley in Sweden is worthy of note, since barley is an extremely important crop both in Denmark and in Norway, and it can be grown farther north in Sweden than can any of the other grains.

Numerous changes have occurred during the past decade in the areas devoted to the different grains. Official acreage data suggest that particularly striking changes occurred between 1926 and 1927; in fact, the increase in the wheat acreage between those two years was so marked as to raise the question whether the increase actually occurred in one year, or whether acreage estimates were revised in 1927 to take account of changes that had been occurring over several years. For the decade as a whole there was a downward trend in the total acreage devoted to cereals in spite of an expansion of the wheat acreage. The decline in the rye acreage was the most striking, but the areas planted to barley and to mixed grain were also appreciably smaller at the end than at the beginning of the period. In the main, the decrease in cereal land represented a decrease in arable land (or a correction of previous estimates of arable land which were too high), though to some extent it represented an expansion of the area planted to grass.

During 1920–30 there were marked upward trends in the yields per acre of barley and oats, and perhaps slight upward trends in the yields of wheat and rye (see Chart 13, p. 357). These increases in yield per acre, which probably represented in part merely a recovery from war conditions, partially offset the effects upon production of decreases in acreage. However, the production both of barley and of rye declined markedly during the decade (mainly since 1927 if the figures may be taken at their face value); and recent outturns of these crops have been considerably smaller than the outturns of pre-war years. The yield per acre of oats increased more during the period than did the yield of any other grain, and, despite a smaller oats acreage than that cultivated in pre-war years, the production of oats has recently fluctuated around the pre-war level. Wheat is the only grain whose acreage and yield per acre have both increased since the war. It is interesting to note that the yields per acre of wheat and of rye tend to fluctuate together from year to year (with the wheat yield always above the rye yield, as in Denmark), while the yields per acre of barley and oats, which likewise fluctuate together, often show variations distinctly different from the variations in the yields of the bread grains.

Consumption of Wheat and of Rye

The available data of wheat and rye utilization in Sweden appear to be about as satisfactory from the standpoint of judging consumption, and to be subject to about the same limitations, as are the corresponding data for Denmark.

The domestic utilization of wheat in Sweden has increased markedly since the war; and rye utilization has shown some tendency to decline. (See Chart 14, p. 358.) While the average annual utilization of rye was almost twice as large (in terms of bushels) as the average domestic utilization of wheat during 1904–05 to 1913–14,[2] the domestic utilization of rye since the war has averaged about the same (22.5 million bushels) as has the utilization of wheat (20.8 million bushels).

These changes in domestic utilization represent, in the main, changes in the size

[1] In 1927 agricultural holdings in Sweden were distributed as follows:

Size of holding	Percentage of total holdings	Percentage of total agricultural area
Under 10 hectares (25 acres)	77.7	34.4
10–50 hectares (25–125 acres)	20.5	45.5
Over 50 hectares (125 acres)	1.8	20.1

[2] See Appendix Table V.

of the native crops of wheat and rye rather than changes in the levels of net imports of the two cereals. In relation to the total domestic utilization of wheat the native crop has been slightly more important since the war than it was in pre-war years; during the five years preceding the war home production of wheat constituted from 48 to 61 per cent of the total domestic utilization, averaging 54 per cent; whereas during the past eight years home production constituted from 39 to 72 per cent of the domestic utilization, averaging 60 per cent. In both pre-war and post-war years the Swedish rye crop more nearly supplied the requirements of the country for rye than the native wheat crop did for wheat. Both from 1909–10 to 1913–14 and from 1922–23 to 1929–30 the domestic rye crop amounted on the average to around 85 per cent of the total domestic utilization of rye; the percentages for individual years, however, fell within a much wider range during the post-war period (72 to 104 per cent) than during the pre-war period (81 to 93 per cent). While Sweden was a net importer of rye in each of the ten years prior to the war, she was a net exporter of rye in three of the ten post-war years (1920–21, 1921–22, and 1926–27). But in spite of this situation the tendency during post-war years seems to have been for Sweden gradually to rely less upon home production for her supply of rye, and at the same time to rely more upon home production for her supply of wheat.

The domestic utilization of wheat and of rye apparently fluctuated during post-war years mainly with the size of the domestic crop. Thus, small outturns were not completely offset by larger imports, nor large outturns by smaller imports; although there appears to have been some tendency for net imports to be larger in years of small native crops. Since the principal wheats of Sweden[1] are soft red winter wheats of only fair milling and baking quality, strong foreign varieties are always needed for the milling mixtures: a fair volume of imports (though not necessarily of net imports) is therefore required no matter how large the native wheat crop may be. To some extent the annual fluctuations in the domestic utilization of wheat and of rye may represent substitution of one grain for the other; but the evidence regarding substitution is not clear. Wheat utilization appears to have fallen distinctly below normal (considering trend) only in 1924–25 and 1926–27; and to have fallen slightly below normal in 1921–22 and 1925–26. Only in two of these four years, 1921–22 and 1925–26, was rye utilization above normal; thus there may have been some substitution of rye for wheat in these two years or, on the other hand, year-end stocks of rye may have been increased. The domestic utilization of rye fell markedly below trend only in one year other than 1924–25; in that year, 1927–28, some wheat may have been substituted for rye since wheat utilization was above its line of trend, or wheat consumption may have remained about constant and year-end stocks of wheat may have been increased.

The per capita utilization both of wheat and of rye is considerably lower in Sweden than in Denmark, a situation which probably reflects, in the main, heavier feeding of these cereals in the latter country. The larger annual fluctuations in wheat and rye utilization in Denmark are probably attributable to the same factor, the demand for the bread cereals being less elastic in Sweden because the livestock industry is less important in that country.

Data of wheat and rye flour production and data of net flour imports suggest that annual fluctuations in flour consumption are much smaller even in percentage terms than annual fluctuations in grain utilization (see Chart 14, p. 358). The data of flour production are obviously incomplete; and we have encountered no official statement to indicate how incomplete they are. Without doubt a larger proportion of the wheat flour than of the rye flour milled is reported, if for no other reason, because only about 15 per cent of all the wheat-flour mills in Sweden are custom mills, while approximately 67 per cent of the rye-flour mills are of that class.[2] As a result of this factor, and perhaps of others, the figures of rye flour utilization (flour manufactured in Sweden plus net imports of flour) are

[1] See Azzi, *Le climat du blé dans le monde*, pp. 416–35.

[2] Gunnar Andersson, *Sweden's Natural Resources in Relation to Industry*, p. 16.

lower than those of wheat flour utilization, in spite of the fact that rye presumably was used as extensively as, if not more extensively than, wheat for human food during those years.

Trade in Wheat and Wheat Flour

In Sweden, as in Denmark, North American wheats are the most popular of all imported wheats (see Chart 18, p. 360). During the nine years 1921–29 North American wheat and wheat flour constituted 58 per cent of the total gross imports of wheat and flour. This situation contrasts markedly with that of pre-war years, when Russian and German sales amounted to about two-thirds of the total wheat imports of Sweden; and Russian sales alone amounted to over one-fourth. Little of the wheat imported from Germany was of German origin. Probably most of it was North American or Argentine wheat; but the available data do not permit a distribution of the imports according to original source. Certain it is, however, that since the war larger quantities of wheat (including flour) have been imported directly from North America, Argentina, and Australia, and smaller quantities have been imported indirectly through Germany and directly from Russia than was the case in the period 1909–13.

Of the total net imports of wheat and flour during 1920–21 to 1929–30, an exceedingly small proportion was in the form of flour (see Chart 15, p. 359). Swedish exports of wheat flour exceeded flour imports in 1925–26; during the other years annual ratios of wheat flour imports to total wheat (including flour) imports ranged from 4 per cent in 1922–23 to 19 per cent in 1920–21, averaging 8 per cent.[1] These percentages for Sweden are much lower than the corresponding percentages for either of the other two Scandinavian countries, a situation to be expected since Sweden has better flour-milling facilities than Norway or Denmark. It is interesting to note that although Sweden was a net exporter of wheat flour in only one post-war year (1925–26), she was a net exporter of rye flour in five years.

The small flour imports of Sweden are presumably attributable in part to the general relationship which has prevailed between the import duties on wheat and the import duties on wheat flour. While wheat flour is probably manufactured on an average basis of something like 70 per cent extraction, the duty on wheat has been maintained during most of the period at about 57 per cent of the duty on wheat flour;[2] thus, tariffs have somewhat favored the importation of wheat rather than of wheat flour. In addition, the livestock industry of Sweden has directly encouraged the home milling of wheat by affording a reasonably good market for millfeeds; but this factor has been as important, if not more important, in Denmark. Finally, flour imports into Sweden have probably been restricted as a result of the commercial policies of the Swedish mills; for the mills have exerted considerable commercial pressure upon wholesale flour merchants to make each merchant limit his dealings in imported flour to 5 per cent of his total flour turnover.[3]

Annual net imports of wheat (including flour) have varied markedly in size during the past decade; even if the crop years 1920–21 and 1921–22 be omitted from consideration (since abnormal trade conditions prevailed during those two years), the variations still appear striking (see Chart 15, p. 359). Net imports were unusually small in 1925–26 and 1926–27, and exceptionally large in 1922–23, 1923–24, and 1924–25. These particular variations cannot be attributed to tariff changes, for the import duties on wheat and flour remained unchanged after June 1922 (see Chart 17, p. 359). Moreover, no part of these variations is attributable to changes in the value of the Swedish currency, because, for all practical purposes, the value of the currency was about constant after July 1922. In 1925–26 and 1926–27 only moderately large supplies of domestic wheat were available, but imports of wheat were probably somewhat restricted by the exceptionally good quality of the wheat (judged on the basis of weight per unit of

[1] See Appendix Table XI.

[2] See Appendix Table X.

[3] *Commercial Intelligence Journal*, October 8, 1927, pp. 485–87.

volume)[1] and by the large rye and feed grain crops of those years, which caused wheat prices to be high relative to the prices of other cereals (see Chart 19, p. 360). In 1926–27 and the years following, an additional factor probably operated to keep net imports lower than they otherwise would have been. Beginning August 1, 1926, the Swedish government issued to each exporter of wheat (or rye) a certificate, equal in value to the duty collectible on imports of the same quantity, which could be used at any time within six months from the date of issue in payment of import duties on the same kind of foreign grain. There can be little doubt that this measure tended to stimulate exports of Swedish wheat,[2] and unless imports of wheat were stimulated to the same extent, which appears doubtful, net imports were lower during the period 1926–27 to 1929–30 than they would have been if export certificates had not been issued.

The large net imports of 1922–23 to 1924–25 can be explained, at least partially, on the basis of the size and the quality of the domestic crops of those years. In 1922–23 and 1924–25 domestic wheat supplies were decidedly below normal, considering trend; while in 1923–24 only moderately large supplies of poor-quality wheat were available.

The imports of 1930–31 presumably have been somewhat affected by the law passed May 31, 1930, empowering the government to require all mills grinding imported wheat to use at least a specified minimum percentage of native wheat. On July 4 the Swedish Department of Agriculture issued a decree extending the provisions of the law to include the compulsory mixing of domestic wheat flour with imported flour. The required percentage of native wheat varied from 45 per cent during the period July 4–July 15, 1930, to 85 per cent during March 1–31, 1931.[3] Although it is impossible to know to what extent the enforcement of these provisions has been responsible for the relatively small imports of wheat and wheat flour during August–February 1930–31, it is interesting to note that in 1923–24, when net imports were of record size, the Swedish Flour Mills Association was under obligation (according to its agreement with the Swedish government) to grind as much native as imported wheat during the year, and to offer on the market wheat flour milled from blended wheat containing at least 80 per cent of Swedish wheat.

Seasonal variations in wheat imports appear to be as important in Sweden as in Denmark (see Chart 16, p. 359). Moreover, the seasonal movement is much the same in the two countries. In Sweden gross imports are characteristically large in the months September–December, strikingly small in one or more of the mid-winter months, January–March, and large again in the spring. During June, July, and August imports are generally larger than in the midst of winter, but no really typical movement exists for these months. Since North America is the principal source of Swedish imports, one might expect the general seasonal movement of imports into Sweden to be closely related to the seasonal movement of wheat exports from North America. Such a relationship appears to exist during September–March, but in the spring North American exports are characteristically small whereas Swedish imports are characteristically large. The increase in Swedish imports in the spring is probably attributable partly to the fact that exports of

[1] The weight in kilograms per hectoliter of wheat and of rye has been officially estimated for the years 1921–29 as follows:

	Winter wheat	Spring wheat	Winter rye	Spring rye
1921	77.5	75.2	72.9	70.3
1922	75.4	74.0	71.4	70.0
1923	74.7	72.3	69.4	68.5
1924	75.5	73.0	70.3	69.0
1925	77.9	75.4	72.8	71.1
1926	77.4	76.6	72.3	70.9
1927	75.4[a]	75.1[a]	68.6[a]	68.8[a]
1928	75.4[a]	74.0[a]	69.4[a]	68.2[a]
1929	76.5[a]	76.0[a]	71.1[a]	69.9[a]
Average 1916–25	76.5	74.0	71.5	70.0

(Data from *Arsvaxten av Statistiska Centralbyran*, 1921–29.)

[a] Preliminary.

[2] Gross exports of wheat and wheat flour from Sweden during 1920–21 to 1929–30 were as follows, in thousand bushels of wheat:

1920–21	300	1925–26	682
1921–22	724	1926–27	2,546
1922–23	729	1927–28	1,716
1923–24	315	1928–29	3,127
1924–25	121	1929–30	1,888

[3] During the same period the minimum percentages of native wheat allowed in any one lot of flour ranged between 30 and 60. The mills which bought Swedish wheat on the basis of prices recommended by the government, however, were allowed to use 10 per cent less native grain than the regulations specified. (*Commercial Intelligence Journal*, April 4, 1931.)

wheat from the Southern Hemisphere are usually heaviest during the months of January–June, and partly to the fact that the seasonal increase in the price of Swedish wheat relative to the price of imported wheat encourages large imports in the late spring and summer. Imports during January–March would perhaps average somewhat higher were it not that a number of the Swedish harbors (including Stockholm and Malmö) are sometimes accessible during those months only by the use of icebreakers. Ports along the Skaggerak, however, are free from ice because of the warming influence of the Gulf Stream.

Cereal Prices

During the past nine years prices of native Swedish wheat at Stockholm have ruled fairly consistently above the prices of British wheat parcels (see Chart 20, p. 361). This relationship, which is in marked contrast to the relationship between the prices of Danish wheat and of British parcels, is probably primarily the result of the Swedish tariff on wheat. Since Swedish prices seldom exceed British parcels prices by the amount of the wheat tariff, it seems reasonable to assume that in the absence of a tariff Swedish wheat in Stockholm, like Danish wheat in Copenhagen, would generally be sold below the price of British parcels.

The spreads between British parcels prices and the prices of Swedish wheat were usually narrower at the beginning than at the end of each crop year; except for different levels, the relationship resembles that between Danish and British prices. Aside from considerations of seasonality, Swedish wheat prices and British parcels prices appear to have been closely related in their fluctuations until the latter part of 1929–30, when Swedish prices ruled steady while British parcels prices sharply declined. The steadiness of Swedish prices during June–October 1930 may probably be attributed in the main to governmental regulations requiring specified proportions of domestic wheat to be used by all flour mills, and the same proportions of domestic wheat flour to be mixed with imported wheat flour.[1] Probably also of significance in maintaining Swedish wheat prices was the scale of minimum prices (ranging between 18 and 20 kroner per 100 kilograms) which a number of the mills agreed to pay during the year September 1930 to August 1931.

There has been some question about the effect of the issuance of export certificates upon the prices of Swedish wheat. For example, the following statement was published as of December 1927: "Since the operation of the law of 1926 concerning the issue of 'export certificates' . . . . the prices of cereals in Sweden have been more in harmony with world prices, which is probably due in the main to the release of cereals for export. . . . ."[2] In the light of evidence presented in Chart 20, this statement appears of doubtful validity; the spreads between Swedish wheat prices and British parcels prices do not appear to have narrowed appreciably since August 1926, nor do Swedish wheat prices appear to have fluctuated more in accord with British parcels prices since that date.

The prices of imported wheat in Sweden (duty paid, free at Swedish harbor) have been maintained at a level of 16 to 38 cents above British parcels prices. During most (three-fourths) of the months from October 1922 to October 1930 the price of imported wheat in Sweden ruled from 22 to 30 cents above British parcels prices, while the duty on imported wheat was maintained at 27 cents per bushel. When the tariff on wheat and the numerous other factors affecting these two price series are taken into account, the range in spreads appears exceedingly small and the relationship between the series appears remarkably close.

Price relationships between Swedish wheat and other Swedish grains (see Chart 19, p. 360) were apparently such as to encourage some substitution of wheat for rye in 1927–28, 1928–29, and perhaps in 1921–22 and 1924–25; and to encourage the use of wheat for feed in 1927–28, and perhaps in 1923–24 and 1928–29. On the other hand rye may have been substituted for wheat in

[1] See p. 381.

[2] Great Britain Department of Overseas Trade, *Report on the Economic, Commercial and Industrial Situation of Sweden*, December 1927, p. 29.

1925–26; and oats and barley may have been used relatively more freely in 1925–26, 1926–27, and 1929–30.

Feed Grains and the Livestock Industry

Sweden is practically self-supporting as regards the utilization of feed grains (see Chart 21, p. 362). During the past ten years domestic production amounted to 93 to 102 per cent of the domestic utilization of oats, and 97 to 108 per cent of the domestic utilization of barley. Barley was exported net in small amounts during six of the post-war years. Annual net imports and exports of oats appear to have been greatly influenced both by the size of the domestic oats crop and by the price of oats. In two of the four years of largest net imports the domestic oats crops were short and oats prices were moderate and high, respectively; in the other two years the domestic oats crops were large and prices were moderate and low, respectively. In the three years when oats was exported net the domestic crops appear to have been large (trend considered) and prices were moderate or low. Corn imports were notably large in 1927–28 when other feed supplies were short and when the price of imported corn was probably slightly lower than usual relative to the prices of other cereals.

There is little direct evidence of the substitution of bread grains for feed grains in Sweden (see Chart 22, p. 363) despite the fact that price relationships apparently favored the feeding of wheat at least in 1927–28, and of rye in part of 1920–21 and in 1923–24. Supplies of the bread grains were larger than normal in 1923–24, 1925–26, and 1928–29; in none of these three years were feed grain supplies notably small, though they probably were slightly below trend in 1923–24 and 1928–29. In 1927–28 when feed grain supplies were smaller than in any other year of the decade, rye supplies were also short, but wheat was abundant and was probably fed in larger quantities than usual.

Data of livestock population in Sweden are available only for the years 1920, 1927, and 1928;[1] hence no comparisons may be made between annual fluctuations in the livestock population and annual fluctuations in the supplies of feed grains. Cattle and pigs have increased in number since the war, while the numbers of sheep and horses have declined. In 1928 the sheep population was smaller than in 1913; but the horse population, though smaller than in 1920, was about 30,000 larger than it was in 1913. It is interesting to note that the percentage increase in the number of cattle between 1920 and 1928 was approximately the same as the percentage increase in the number of pounds of feed grain supplies available. The proportional increase in the pig population, however, was much greater.

III. NORWAY

Production of Cereals

In Norway cereals are grown somewhat farther north than in Sweden: in the western part of Norway wheat is raised almost as far north as 65° North latitude, and barley ripens as far north as 70°.[2] The Gulf Stream, which flows along the western coast, has a warming influence upon the climate; and, as a result, most parts of Norway have higher average temperatures than land located elsewhere on the same degrees of latitude. Rainfall is often excessive in the western sections of the country, while drought is frequently encountered in the interior sections and in the east: these conditions tend to restrict certain types of agricultural enterprise, among which is the cultivation of wheat. Topography is likewise an important factor from the standpoint of agriculture; only one-fifth of Norway is less than 150 meters (approximately 500 feet) above sea-level; and the high mountains along the northeastern border are suitable for practically no agricultural pursuit other than the raising of cattle or sheep.

Only about 2 per cent of the total land

[1] See Appendix Table XVII.

[2] Musset, *Le blé dans le monde*, p. 31; *The Norway Year Book, 1924*, p. 22.

area of Norway is arable;[1] 24 per cent is devoted to woods and forests, and another 1 per cent is used as permanent meadow land. Most (about 65 per cent) of the arable land is used for raising grass, and only about 25 per cent for the cultivation of cereals.

Of the various cereals, oats ranks first in importance and barley ranks second, judged on the basis of acreage (see Chart 23, p. 363); but even the areas devoted to these major grains are relatively small—around 250 thousand acres to oats, and 150 thousand acres to barley. Much smaller areas are planted to the bread grains and to mixed grain, wheat occupying only about 30 thousand acres.

Many changes have occurred since pre-war years in the areas devoted to the cultivation of the various cereals. During the war the area sown to each of the major grains was greatly expanded; after the war the cereal areas were again reduced. In recent years both the oats acreage and the rye acreage have been smaller than they were in 1909–13; the areas planted to barley and wheat have been larger, though not so large as during the war period. In considering recent trends in cereal acreage one must omit the first two or three years of the past decade; for post-war readjustments were apparently still occurring in those years.[2] Since 1924 in the case of oats, and since 1922 in the case of the other cereals, there has been a tendency for the oats acreage and the mixed grain acreage to remain about stationary, for the wheat and barley areas to increase slightly, and for the acreage planted to rye to decrease. The total area devoted to cereals has remained fairly constant during 1923–30.

Yields per acre of oats, of barley, and perhaps of wheat have tended upward over the past decade (see Chart 24, p. 364); the causes are not clear, and may lie mainly in the succession of seasons. Post-war yields per acre of barley, rye, and wheat have fluctuated around their respective pre-war levels, post-war yields of the two latter grains being generally higher than the average yields for 1915–19. The large range in the yields per acre of oats over the past decade (31 to 59 bushels) makes comparisons with five-year average yields for 1909–13 and 1915–19 almost meaningless; however, it is probably significant to note that during 1920–23 oats yields were generally below the average yields for both pre-war and war years, while during 1925–30 they exceeded both of the five-year average yields.

Consumption of Wheat and of Rye

In Norway, as in the other two Scandinavian countries, the domestic utilization of wheat was higher, and the domestic utilization of rye lower, in post-war than in pre-war years (see Chart 25, p. 364). During the period 1909–10 to 1913–14 wheat utilization averaged around 4.2 million bushels, and rye utilization around 11.1 million bushels; whereas during 1920–21 to 1929–30 the average annual domestic utilization of wheat was 7.0 million bushels, and that of rye was 7.7 million bushels. During the post-war period there was a distinct upward trend in wheat utilization (the utilization of wheat increasing even more rapidly than the population of the country) and a downward trend in rye utilization. Up to 1928–29 the per capita utilization of rye exceeded the per capita utilization of wheat; but in 1928–29 and 1929–30 the per capita utilization of wheat was higher.

Domestic crops of wheat and of rye represented an exceedingly small portion of the total domestic utilization of each of these cereals during post-war years. In most of the years over 90 per cent of the wheat and of the rye utilized in Norway was imported, the percentages for individual years ranging between 79 and 93 in the case of wheat, and between 86 and 93 in the case of rye.

Annual variations in the domestic utilization of wheat and of rye were much smaller in Norway than in either Denmark or Sweden. Several factors presumably were responsible for the smaller variation

[1] Arable land has been increased during post-war years probably partly as a result of cheap loans and grants-in-aid which have been made by the government to encourage the cultivation of new land.

[2] Furthermore, the data are such that one may question if accurate estimates of the areas planted to the different cereals are available before 1922; it may be that the official acreage figures for 1920 and 1921 are more or less too high.

in the Norwegian utilization. First, since Norway was primarily dependent upon net imports for her bread grains she could more easily control grain supplies than could Denmark or Sweden, which depended primarily upon domestic production. Second, during most of the period the control of grain imports into Norway was in the hands of a government monopoly which deliberately attempted to keep imports at a minimum. Finally, the demand for wheat and rye for feeding purposes was presumably quite small in Norway as compared with the demand in Denmark. This last circumstance is probably also of importance in accounting for the fact that the per capita domestic utilization of wheat and of rye in Norway was lower than in Denmark or Sweden; but, of course, there may also have been a lower per capita human consumption of the bread grains in Norway.

Data of wheat and rye flour production in Norway are not available prior to 1927; thus, they add little to our knowledge regarding the consumption of the bread grains.[1] Even for 1927 and 1928 the data are in such form that one can not ascertain even approximately what portion of the wheat flour and what portion of the rye flour consumed within the country was produced in domestic mills. Data of flour imports, however, suggest that the wheat flour milled in Norway probably constituted a much smaller proportion of the total amount of wheat flour consumed in that country than was true for Denmark or Sweden.

Trade in Wheat and Wheat Flour

During post-war years Norway has purchased most (71 per cent on the average) of her imported wheat and flour from the United States and Canada: this represents a considerable change as compared with pre-war years, when most of the wheat (including flour) imports into Norway came from Germany and Russia (see Chart 29, p. 366). This change is probably primarily a change from indirect buying through Germany to direct buying from the countries of origin; though there has also been a real reduction in the imports of Russian wheat.

Flour imports bulk larger in proportion to total imports in Norway than in either of the other Scandinavian countries (see Chart 26, p. 365).[2] During 1920–21 to 1929–30 imports of flour constituted around 46 per cent of the total wheat and flour imports. This percentage, though large in comparison with the corresponding figures for Sweden and Denmark, is considerably smaller than the percentage for pre-war years in Norway (76 per cent). One may therefore infer that the milling of wheat expanded greatly in Norway during the war; and that domestic mills supplied a much larger proportion of the total flour consumption after the war than they did prior to the war. Tariffs on wheat and wheat flour have been such as to favor Norwegian mills, at least since 1907. During most of the period 1907–27 the duty on wheat was only about 30 per cent of the duty on wheat flour; from May to July 1927 it was about 48 per cent of the flour duty; and from July 1927 to June 1928 it was about 58 per cent.[3] With such tariff protection it is surprising that wheat milling in Norway did not develop more than it did, and that foreign mills continue to supply such a large portion of the annual flour requirements of the country.

Annual net imports of wheat (including flour) since the war have shown remarkably little variation from year to year (see Chart 26, p. 365). If 1920–21 be disregarded (because war influences still prevailed), only one year, 1928–29, stands out as deviat-

[1] Flour production in Norway in 1927 and 1928 was reported as follows in tons:

	Wheat flour		Rye flour		Mixed wheat and rye
	Fine sifted	Coarse sifted	Fine sifted	Coarse sifted	Fine sifted
1927	40,657	6,653	4,910	10,511	113,916
1928	49,086	7,817	9,764	10,678	86,655

[2] The "Statens Kornforretning" (State Grain Monopoly) controlled the importation of flour during most of the post-war period. (For a description of some of the practices of the Monopoly see pp. 386–87.) In recent years the Monopoly has sold the imported flour under government brands. In 1929–30 eight brands were used: three for Canadian flours, patent, straight, and clear; one for American hard winter-wheat flour; one for patent flour milled in bond at Buffalo; two for English milled flour, patent and straight; and one for flour of French origin. (C. F. G. Raikes, "Notes on the Norwegian Flour Trade" in *The Northwestern Miller*, May 7, 1930, p. 463.)

[3] See Appendix Table X.

ing markedly from the post-war average of annual net imports. Several factors appear to have encouraged large imports in 1928–29. In the first place, wheat prices were unusually low as compared with wheat prices in previous years and as compared with the prices of other grains (see Charts 30 and 31, pp. 367–68). In the second place, Canada had large quantities of low-grade wheat available for export at prices which were exceedingly attractive. And finally, in 1928–29 wheat could be imported into Norway on private initiative, duty free. The government import monopoly, which had operated since the war period, was abandoned in July 1927, and the import duty on wheat was removed in June 1928 (see Chart 28, p. 366). Certain of these factors were present in other years; but in no other year did such a group of factors combine to favor large imports. Thus, while imports of wheat and flour were not taxed during most of 1922–23 or during 1929–30, they were subject to government monopoly in both years, and wheat was higher in price relative to other cereals in those years than in 1928–29. In 1927–28 there was no government monopoly on grain imports, but high import duties were in effect, and wheat was slightly higher in price as compared with other grains.

Monthly imports of wheat and flour into Norway do not show such marked seasonality of movement as do the monthly imports of Denmark and Sweden (see Chart 27, p. 366). Nevertheless, certain monthly variations may be said to be typical of the wheat (including flour) imports of Norway. The ten-year average (1920–21 to 1929–30) of monthly imports appears reasonably typical for the fall and winter months, but not typical for the spring or summer months. Thus, imports generally rise from a low level in August to a peak in November or December, then decline again to a low level in January and February. During March–July, however, no general movement appears to be really typical; imports may fluctuate around a relatively high, or a relatively low, level in those months, though the level is characteristically lower than that of the preceding November–December. From August to March the seasonal movement of imports coincides fairly well with the seasonal movement of North American exports, a correspondence which is probably partly due to the fact that Norway imports such large quantities of North American wheat. Since the harbors of Norway are entirely free from ice throughout the year, the small imports of January–February can not be attributed, even in part, to difficulties involved in gaining entrance to the ports.

Cereal Prices

During post-war years the course of Norwegian wheat prices and the relationship of those prices to British parcels prices have undoubtedly been greatly influenced by the operating policies of the State Grain Monopoly. To understand Norwegian wheat prices, then, one must first know something about the character and the practices of that organization. The Grain Monopoly, an agent of the State, has completely controlled the importation of wheat and wheat flour during the whole of the past decade with the exception of the period July 1927–July 1929; moreover, during recent years the Monopoly has bought and distributed considerable quantities of home-grown grain, and has practically controlled the milling of flour. Prior to July 1927 only small quantities of domestic wheat were purchased by the Grain Monopoly, as the State's buying prices did not then include any bonus and were often lower than the prices most growers could secure from private individuals.[1] Between July 1927 and July 1929 the Monopoly purchased practically the entire portion of the domestic wheat crop "suitable for human consumption"[2] at fixed prices (uniform throughout the country), which by law had at least to equal the corresponding c.i.f. prices of imported wheat delivered at a Norwegian port (not including duty) plus a bonus of 4 öre per kilogram (approxi-

[1] Great Britain, Department of Overseas Trade, *Report on the Economic and Industrial Conditions in Norway, 1923* and *1924*.

[2] The Monopoly provided that each grower should receive a bonus of 4 öre per kilogram for the wheat (also rye and barley) ground and used for human food within his own household, the bounty applying to any quantity up to 200 kilograms of milled grain per person in the household.

mately 7 cents per bushel);[1] the Monopoly then sold the grain to importers and millers at higher fixed prices, all importers being required by law to buy Norwegian wheat in amounts equal to 7.5 per cent of their wheat imports. In July 1929 the present law went into effect. According to its provisions the State Grain Monopoly is required to purchase all the home-grown wheat "suitable for human consumption" offered to it at a price at least equal to the Monopoly's selling price for the milled products of wheat minus the costs involved in milling. This price has been reported to be around 4 öre per kilogram higher than the price of foreign wheat at a Norwegian port (not including the duty).[2] After the native wheat is cleaned and mixed to a uniform grade, it is distributed to the various flour mills. The mills desiring to buy imported wheat are required to pay a fixed price and to grind the grain according to instructions from the Monopoly. In marketing flour the Norwegian mills and the wholesalers of imported flour are required to sell the flour at specified prices which are uniform throughout the country. Each miller and each wholesaler of imported flour receives a fixed fee for every 100 kilograms of flour he sells.

With these few facts concerning the activities of the Grain Monopoly in mind, we may turn to an inspection of Norwegian cereal prices. Monthly average prices are not available for Norwegian grains, and we must rely wholly upon quarterly averages for comparisons.

During the past nine years the spread between quarterly average prices of Norwegian wheat and quarterly average British parcels prices was strikingly irregular as compared with the spreads between the prices of Danish or Swedish wheat and British parcels (see Chart 30, p. 367). From 1921–22 to 1924–25 the spread between Norwegian wheat prices and British parcels prices ranged between −8 cents and 81 cents per bushel in terms of United States currency; from 1925–26 to 1929–30 the spread was somewhat more constant, fluctuating within the limits of 34 to 64 cents and generally approximating 40 to 50 cents.

These variations cannot readily be explained on the basis of information available to us. To some extent they are probably due to the limitations of the available price data (expressed in Norwegian currency), and to the conversion of the data into United States currency. During 1922–23 and 1923–24 the Norwegian exchange depreciated markedly in terms of United States currency;[3] during the same period Norwegian wheat prices declined more in United States money than did British parcels prices. During 1924–25 the Norwegian exchange rose rapidly in value and the average price of Norwegian wheat increased more in United States money than did the average price of British parcels. Thus, in terms of Norwegian currency, Norwegian wheat prices were considerably more stable than the prices of foreign exchange; and much of the instability apparent in the converted series of Norwegian wheat prices between 1921–22 and 1924–25 appears to be attributable to fluctuations in the exchange.

Why did the price of Norwegian wheat, in terms of Norwegian currency, remain so stable at times when the exchange rate first was depreciating, and then appreciating rapidly? This appears to be a question of considerable importance; unfortunately, however, it is one which cannot be answered with any definite assurance of accuracy. Prices in domestic currency may have remained relatively stable because Norwegian growers and dealers were greatly influenced by custom and were reluctant to change domestic wheat prices; or, on the other hand, the price stability may have resulted primarily from the operations of the Grain Monopoly. Prior to

[1] The bonus was to be paid out of the proceeds accruing from the import duties on wheat and wheat flour.

[2] Kungl. Maj:ts proposition till rikodagen (Nr. 108) angaende vissa atgärder till det svenska jordbrukets stödjande; given Stockholms slott den februari 1930.

[3] Quarterly average Norwegian exchange rates (cable transfers in New York) between 1921 and 1930 were as follows in U.S. cents per krone:

Year	Jan.–Mar.	Apr.–June	July–Sept.	Oct.–Dec.
1921	17.2	15.5	13.1	14.0
1922	16.6	18.1	16.9	18.4
1923	18.5	17.0	16.2	15.0
1924	13.7	13.7	13.7	14.7
1925	15.3	16.7	19.3	20.3
1926	20.9	21.8	21.9	24.7
1927	25.8	25.9	26.0	26.5
1928	26.6	26.8	26.7	26.7
1929	26.7	26.7	26.6	26.8
1930	26.7	26.8	26.8	26.7

July 1927 the Grain Monopoly exerted control over domestic wheat prices almost solely through its monopoly on imports; after July 1927 it maintained a more direct control over domestic prices by its extensive purchases of native wheat at prices established by the State.

Since the Norwegian tariff on wheat varied only from 0 to 6.4 cents per bushel (in terms of United States money) between 1921–22 and 1924–25, only a small fraction of the variation in the spread between Norwegian wheat prices and British parcels prices can possibly be ascribed to changes in import duties. Furthermore, tariff changes do not appear to have influenced the price-spread markedly during 1925–26 to 1929–30, even though fairly large changes in duties were effected during those years. For example, the spread between Norwegian wheat prices and British parcels prices was widest during October–September 1921–22 (63 to 81 cents), when the tariff on wheat was 0 to 5 cents per bushel, during July–September 1925 (64 cents), when a tariff of about 6 cents per bushel was in force, and during July–September 1928 (62 cents), when no import duty was collected. During 1927–28 when import duties were highest (around 25 cents per bushel), the spread was not appreciably different from that prevailing in 1928–29 when wheat could be imported free of duty. It is probably worth noting, however, that the effect of tariff changes upon Norwegian wheat prices might perhaps have been more apparent had it not been for the activities of the Grain Monopoly.

As regards the direction of change in price from quarter to quarter, Norwegian wheat prices coincided fairly well with British parcels prices after October–December 1925. Prior to October–December 1925 fluctuations in the Norwegian exchange rate, changes in tariff duties, and perhaps certain practices of the Grain Monopoly probably accounted for at least part of the lack of correspondence between the two price series.

Little seasonality is apparent in the series of Norwegian wheat prices (see Chart 30, p. 367), despite the fact that eight-year averages of spreads (quarterly) between British parcels prices and Norwegian wheat prices indicate higher average spreads for the April–June and July–September quarters than for the October–December or the January–March quarters. Since most of the Norwegian wheat is harvested in early September one would expect a seasonal price movement of this sort. When, however, one examines each of the years for evidence of price seasonality one is forced to conclude that the eight-year averages of quarterly price-spreads are not representative of the situations in the individual years; and that there is little basis for assuming that the spread between Norwegian wheat prices and British parcels prices has generally tended to widen as the season advanced.

The relationships between quarterly average prices of Norwegian wheat and quarterly average prices of rye, barley, and oats (see Chart 31, p. 368) suggest that substitution of wheat for rye may have taken place on a rather extensive scale in 1921–22 and 1928–29, while in 1925–26 large quantities of rye may have been substituted for wheat. The prices of barley and oats were unusually high relative to wheat prices in 1923–24 and 1928–29; if wheat was extensively fed in any post-war year, it was probably fed on a considerably larger scale in 1923–24 and 1928–29 than in any of the other years. The reverse price situation prevailed in 1926–27; but one may infer that price relationships never greatly encourage the substitution of feed grains for wheat.

Feed Grains and the Livestock Industry

While Norway depends mainly upon home production for her supplies of feed grains, she usually imports a larger proportion of those supplies than does either Denmark or Sweden (see Chart 32, p. 368). During post-war years domestic production amounted to 75 to 99 per cent of the total domestic utilization of oats, and to 54 to 86 per cent of the total domestic utilization of barley. One of the most striking features of the feed grain situation in Norway was the decline in the domestic utilization, and the increase in the native production, of barley after the war. Thus, while home production accounted on the average for about 75 per cent of the domestic utiliza-

tion of barley during 1920–21 to 1929–30, it accounted for only 39 per cent over the period 1904–05 to 1913–14.

During most of the post-war period the domestic utilization of oats and of barley fluctuated from year to year in much the same manner as did native production. The year 1923–24 was a notable exception as regards barley; for the domestic utilization of that grain was maintained at a fairly normal figure in 1923–24 despite the fact that the native barley crop was smaller than in any other year of the decade. The large barley, and also oats, imports of 1923–24 probably can not be ascribed solely, however, to the failure of the native crops, for feed grain prices were notably low that year. However, in 1922–23 and 1929–30, when feed grain prices were also low, net imports of oats were small and net imports of barley were not appreciably larger than in several other years when barley prices were relatively high.

Domestic utilization figures suggest that in the aggregate, feed grain supplies were relatively large (considering trend) in 1921–22, 1922–23, 1925–26, and 1926–27; and that they were relatively small in 1923–24, 1924–25, 1928–29, and 1929–30 (see Chart 34, p. 369). In two of the years of small feed supplies, 1923–24 and 1928–29, bread grains were abundant, and cheaper as compared with feed grains than in other post-war years of the period; hence in these two years wheat and rye may have been substituted for the feed grains on a larger scale than usual. But despite such possible substitution, annual changes in feed grain supplies over the period 1922–23 to 1929–30 appear generally to have resulted in similar changes in the livestock population, especially in the pig population. Thus, while the numbers of cattle, of sheep, and of pigs all tended upward over the period, the cattle and sheep populations decreased or remained about stationary during 1923–24 and 1928–29; and the pig population fell below its approximate line of trend in three of the four years of short feed supplies, and rose above its line of trend in at least two of the four years when feed supplies were large[1] (see Chart 33, p. 369). The horse population declined fairly consistently throughout the period. Horses and pigs are raised only in small numbers in Norway, while fairly large numbers of cattle and of sheep are maintained.

[1] Livestock data are not available for one of the years.

This study is the work of Helen C. Farnsworth, with suggestions and criticisms of M. K. Bennett and with the aid of P. S. King, Katharine Merriam, and Rosamond H. Peirce

APPENDIX

TABLE I.—LAND UTILIZATION IN THE SCANDINAVIAN COUNTRIES, 1923–29*

(Thousand acres)

Year	Total area[a]	Arable land				Non-arable land				
		Total	Cereals	Sown grass and other fodder	Other crops and bare fallow	Total	Permanent meadows[b]	Woods and forests[c]	Trees shrubs, and bushes	Other
	DENMARK									
1923.....	10,629	6,478	3,109	2,712	657	.....	700	.....	...	.....
1924.....	10,629	6,478	3,080	2,739	660	.....	748	.....	...	.....
1925.....	10,629	6,499	3,136	2,713	649	.....	767	.....	...	.....
1926.....	10,607	6,482	3,171	2,706	604	.....	781	.....	...	.....
1927.....	10,607	6,485	3,198	2,698	589	.....	784	.....	...	.....
1928.....	10,607	6,517	3,226	2,739	552	.....	760	.....	...	.....
1929.....	10,607	6,376	3,264	2,622	490	.....	633	.....	...	.....
	SWEDEN									
1923.....	101,455	9,399	4,034	3,987	1,378	92,055	2,280	60,746	124	28,905
1924.....	101,455	9,408	4,004	4,008	1,395	92,047	2,280	60,746	124	28,897
1925.....	101,455	9,414	4,105	3,936	1,373	92,040	2,280	60,746	124	28,890
1926.....	101,455	9,416	4,159	3,984	1,273	92,038	2,280	60,746	124	28,888
1927.....	101,455	9,185	3,837	4,085	1,263	92,270	2,280	60,746	124	29,119
1928.....	101,455	9,185	3,792	4,125	1,267	92,270	2,280	60,746	124	29,119
1929.....	101,444	9,182	3,829	4,134	1,219	92,263	3,135	53,736	96	35,295
	NORWAY									
1923.....	76,576	1,624	451	1,036	137	74,952	665	17,736	24	56,528
1924.....	76,576	1,641	433	1,065	143	74,935	656	17,736	24	56,520
1925.....	76,576	1,658	442	1,077	138	74,919	622	17,736	24	56,538
1926.....	76,620	1,671	448	1,085	139	74,949	622	18,531	24	55,772
1927.....	76,620	1,687	454	1,092	141	74,933	622	18,531	24	55,756
1928.....	76,620	1,704	458	1,102	143	74,916	622	18,531	24	55,739
1929.....	76,620	1,887	432	1,320	134	74,733	545	18,531	29	55,628

* Data from *International Yearbook of Agricultural Statistics.*

[a] Total *land* area in Sweden and Norway.

[b] Permanent meadows and pasture land in Denmark.

[c] Forests and pasture land in Sweden.

TABLE II.—ACREAGE, PRODUCTION, AND YIELD PER ACRE OF WHEAT AND OF RYE IN SWEDEN AND IN NORWAY, 1901–19*

(Thousand acres; thousand bushels; bushels per acre)

Year	Sweden						Norway					
	Wheat			Rye			Wheat			Rye		
	Acreage	Production	Yield per acre	Acreage	Production	Yield per acre	Acreage	Production	Yield per acre	Acreage	Production	Yield per acre
1901.....	195	4,471	22.92	1,014	22,246	21.94	13[a]	318	25.39	32[a]	852	26.35
1902.....	202	4,657	23.02	1,017	22,832	22.45	..	264	21.08	..	776	24.00
1903.....	201	5,526	27.56	1,014	24,377	24.04	..	306	24.44	..	856	26.48
1904.....	200	5,249	26.26	1,017	21,165	20.82	..	212	16.88	..	717	22.17
1905.....	206	5,526	26.86	1,014	25,584	25.23	..	328	26.16	..	981	30.34
1906.....	212	6,686	31.53	1,015	27,001	26.59	..	302	24.11	..	962	29.77
1907.....	217	6,182	28.50	1,006	21,028	20.91	12[a]	289	23.32	37[a]	822	22.09
1908.....	225	7,049	31.35	1,000	26,172	26.18	..	329	26.52	..	868	23.33
1909.....	237	7,414	31.33	998	25,635	25.70	..	312	25.18	..	1,010	27.16
1910.....	241	7,696	31.94	992	24,498	24.69	..	293	23.61	..	895	24.06
1911.....	251	8,106	32.33	989	24,283	24.56	..	270	21.77	..	947	25.46
1912.....	259	7,797	30.08	989	23,075	23.34	..	331	26.66	..	1,041	27.98
1913.....	290	9,502	32.81	917	23,009	25.10	..	324	26.12	..	972	26.14
1914.....	288	8,906	30.88	968	26,776	27.66	12	269	21.66	37	1,045	27.90
1915.....	315	9,660	30.67	958	23,652	24.69	14	284	20.89	48	829	17.19
1916.....	318	9,038	28.41	912	21,334	23.39	14	316	23.16	49	942	19.33
1917.....	329	6,929	21.09	818	13,904	16.99	22[a]	430	19.97	27[ab]	1,159	43.29[b]
1918.....	379	8,888	23.47	948	19,292	20.35	41	1,087	26.55	37	1,012	27.60
1919.....	347	9,351	26.92	920	22,607	24.57	41	1,071	26.16	37	983	26.80

* Data of acreage and production from *Statistisk arsbok för Sverige*, and *Statistisk Arbok for Kongeriket Norge*, with the exception of Norwegian acreage figures for 1914–16 and 1918–19, which are from *International Yearbook of Agricultural Statistics*. Here and in subsequent tables wheat statistics are given in terms of bushels of 60 pounds and rye statistics in terms of bushels of 56 pounds.

[a] Census data.

[b] The U.S. Department of Agriculture carries an acreage figure of 58 thousand acres for 1917; and a figure which, when converted, approximates 58 thousand acres was carried by the International Institute of Agriculture up to March 1919, after which date the census figure was printed. The yield per acre calculated on the basis of the census estimate (43 bushels per acre) appears unreasonably high, while that calculated on the assumption of a rye area of 58 thousand acres (20 bushels per acre) appears fairly reasonable.

TABLE III.—AREAS AND YIELDS PER ACRE OF THE VARIOUS CEREALS AND OF POTATOES IN THE SCANDINAVIAN COUNTRIES, 1920–30, WITH AVERAGES FOR EARLIER YEARS*

(Thousand acres; bushels per acre)

Year	Acreage						Yield per acre					
	Wheat	Rye	Oats	Barley	Mixed grain[a]	Potatoes	Wheat	Rye	Oats	Barley	Mixed grain[a]	Potatoes
	DENMARK											
Average 1909–13[b]	154	636	1,161	639	...	161	41.05	30.04	52.16	42.03	.....	202.75
1920	180	560	1,091	626	496	228	41.10	23.65	46.58	39.46	44.02	198.85
1921	220	559	1,112	628	479	208	50.74	21.84	46.92	43.86	45.76	241.31
1922	237	547	1,118	667	465	204	38.97	26.12	52.22	45.65	48.63	241.15
1923	205	574	1,122	690	511	204	43.22	26.36	56.26	47.06	51.78	222.96
1924	149	466	1,141	745	573	177	39.42	22.41	55.40	45.93	49.88	152.53
1925	198	530	1,099	744	560	186	49.28	25.93	59.88	49.13	54.08	258.63
1926	252	514	1,048	770	585	189	34.86	24.27	57.59	43.37	49.88	157.62
1927	274	453	1,012	822	633	177	34.32	22.88	60.16	43.87	52.39	117.08
1928	252	361	999	877	734	154	48.42	25.22	73.00	57.62	62.12	279.19
1929	257	376	968	909	753	158	45.76	27.70	73.64	56.23	61.23	249.84
1930[c]	252	372	967	938	...	170	41.56	26.99	73.67	53.03	.....	217.86
	SWEDEN											
Average 1909–13	255	977	1,956	448	...	377	31.70	24.68	43.99	33.57	.....	152.82
1915–19	338	911	1,878	428	...	388	26.11	22.00[d]	38.64	29.62	.....	176.07
1920	358	914	1,752	398	651	364	28.86	24.55	39.90	28.08	39.72	164.16
1921	358	914	1,751	397	649	363	34.49	29.07	42.86	30.22	44.02	177.88
1922	356	872	1,798	427	667	400	26.71	25.39	42.90	31.61	42.88	177.26
1923	362	869	1,775	382	646	392	30.40	26.89	40.83	29.88	43.68	152.84
1924	322	654	1,909	428	692	390	21.14	16.65	37.27	30.93	40.82	133.61
1925	363	871	1,803	412	656	392	36.83	30.56	44.92	35.00	46.88	197.33
1926	381	838	1,827	443	669	396	31.91	27.55	47.94	33.77	45.48	181.00
1927	562	683	1,723	302	567	345	28.18	22.18	43.77	30.11	41.06	100.67
1928	562	682	1,715	272	561	345	34.09	25.14	48.49	35.82	48.21	195.62
1929	574	631	1,744	307	574	348	33.16	25.80	50.60	37.46	51.51	203.47
1930[c]	632	592	1,874	325	...	347	33.97	32.39	42.19	33.91	.....	169.52
	NORWAY											
Average 1909–13	12	37	263	89	...	102	24.67	26.16	45.46	33.98	.....	224.96
1915–19	26	43	309	125	...	121	23.35	22.73	50.30	33.93	.....	254.47
1920	40	36	342	156	29	130	24.70	26.70	44.10	34.55	43.42	238.29
1921	41	36	342	156	29	130	23.98	28.67	37.91	27.47	38.27	199.34
1922	25	30	301	132	22	126	26.01	29.00	44.48	33.94	43.96	259.12
1923	26	27	256	125	20	113	22.91	27.31	31.24	26.34	34.65	215.05
1924	21	25	230	136	20	117	23.09	25.08	46.26	34.44	44.16	184.27
1925	22	22	241	139	19	117	22.26	27.73	50.09	37.29	51.57	295.81
1926	22	23	241	143	18	119	26.59	27.67	55.28	35.80	51.93	276.10
1927	25	23	240	150	17	123	24.65	26.31	52.82	31.18	45.13	180.25
1928	28	18	246	149	17	125	28.14	27.10	51.56	34.54	47.54	280.22
1929	30	18	239	132	14	114	25.41	29.25	50.88	34.31	47.99	289.01
1930[c]	30	19	239	134	...	117	25.87	30.89	58.80	37.60	.....	241.41
	SCANDINAVIA											
Average 1909–13[b]	422	1,650	3,380	1,176	...	640	34.92	26.77	46.91	38.20	.....	176.85
1920	578	1,510	3,185	1,180	1,176	723	32.38	24.27	42.64	34.98	41.62	188.48
1921	618	1,509	3,205	1,181	1,157	701	39.58	26.38	43.74	37.11	44.61	200.68
1922	618	1,448	3,218	1,226	1,154	730	31.39	25.74	46.29	39.50	45.21	209.27
1923	593	1,471	3,153	1,197	1,176	709	34.51	26.69	45.54	39.42	47.06	182.92
1924	492	1,145	3,280	1,310	1,285	684	26.76	19.18	44.21	39.83	44.91	147.16
1925	583	1,423	3,143	1,295	1,235	695	40.51	28.79	50.55	43.37	50.22	230.28
1926	654	1,376	3,116	1,357	1,272	705	32.86	26.32	51.75	39.44	47.58	190.79
1927	861	1,159	2,974	1,275	1,218	645	30.04	22.54	50.08	39.12	47.00	120.38
1928	843	1,062	2,961	1,298	1,311	624	38.18	25.74	57.02	50.41	56.00	233.19
1929	861	1,025	2,950	1,347	1,340	620	36.66	26.56	58.18	49.81	56.93	231.03
1930[c]	914	983	3,080	1,397	...	634	35.80	30.31	53.36	47.10	.....	195.75

* Acreage data from *Statistisk Aarbog* (Denmark), *Statistisk arsbok för Sverige, Statistisk Arbok for Kongeriket Norge,* and for 1927–30 from U.S. Department of Agriculture's *Yearbook of Agriculture* and *Foreign Crops and Markets.* Yields per acre calculated from acreage data (above) and production data (Table IV).

[a] "Mixed grain" refers to a mixture of cereals (50%) and pulse (50%) or a mixture of barley (40%) and oats (60%) in Denmark; to a mixture of barley (35%), oats (54%), and pulse (11%) in Sweden; and to a mixture of barley (33 1-3%) and oats (66 2-3%) in Norway. Because of the uncertainty regarding the exact nature of the mixtures, yield per acre and production figures are rough approximations.

[b] Estimates of the U.S. Department of Agriculture for grain areas and yields within present boundaries.

[c] Preliminary.

[d] Four-year average; yield for 1917 omitted. See Table II, footnote [b].

TABLE IV.—PRODUCTION OF THE VARIOUS CEREALS AND OF POTATOES IN THE SCANDINAVIAN COUNTRIES, 1920–30, WITH AVERAGES FOR EARLIER YEARS*

(Thousand bushels)

Year	Wheat	Rye	Oats	Barley	Mixed grain[a]	Potatoes
			DENMARK			
Average 1909–13[b]	6,322	19,104	60,557	26,860	.....	32,642
1920	7,390	13,242	50,794	24,707	21,836	45,315
1921	11,145	12,204	52,158	27,548	21,927	50,173
1922	9,249	14,284	58,403	30,433	22,610	49,249
1923	8,858	15,145	63,104	32,457	26,456	45,496
1924	5,864	10,433	63,208	34,219	28,602	27,039
1925	9,748	13,745	65,837	36,574	30,312	48,167
1926	8,767	12,480	60,333	33,415	29,159	29,827
1927	9,408	10,364	60,863	36,082	33,186	20,745
1928	12,214	9,683	72,960	50,541	45,570	43,086
1929	11,772	10,411	71,276	51,093	46,085	39,388
1930[c]	10,472	10,039	71,236	49,741	.....	37,037
			SWEDEN			
Average 1909–13	8,103	24,100	86,050	15,035	.....	57,580
1915–19	8,773	20,158	72,639	12,624	.....	68,381
1920	10,322	22,434	69,914	11,175	25,844	59,800
1921	12,335	26,558	75,070	11,994	28,564	64,542
1922	9,513	22,132	77,154	13,503	28,592	70,876
1923	11,005	23,366	72,493	11,429	28,200	59,916
1924	6,800	10,883	71,145	13,252	28,238	52,109
1925	13,359	26,615	81,009	14,426	30,741	77,384
1926	12,153	23,094	87,596	14,971	30,433	71,747
1927	15,835	15,144	75,404	9,106	23,298	34,719
1928	19,155	17,152	83,191	9,743	27,043	67,467
1929	19,032	16,282	88,238	11,485	29,549	70,843
1930[c]	21,469	19,172	79,058	11,021	.....	58,822
			NORWAY			
Average 1909–13	306	973	11,939	3,016	.....	22,882
1915–19	638	985	15,290	4,266	.....	30,869
1920	999	970	15,078	5,382	1,262	31,076
1921	972	1,043	12,960	4,279	1,118	25,995
1922	643	862	13,380	4,483	965	32,698
1923	587	742	7,999	3,282	691	24,269
1924	493	637	10,641	4,692	866	21,517
1925	490	614	12,048	5,180	968	34,500
1926	586	647	13,332	5,125	933	32,870
1927	605	606	12,665	4,672	760	22,232
1928	798	497	12,680	5,133	803	34,933
1929	750	538	12,146	4,533	656	33,070
1930[c]	776	587	14,054	5,039	.....	28,245
			SCANDINAVIA			
Average 1909–13[b]	14,731	44,177	158,546	44,911	.....	113,102
1920	18,711	36,646	135,786	41,264	48,942	136,191
1921	24,452	39,805	140,188	43,820	51,609	140,711
1922	19,404	37,278	148,937	48,419	52,167	152,824
1923	20,449	39,253	143,597	47,168	55,347	129,682
1924	13,157	21,953	144,993	52,162	57,706	100,665
1925	23,597	40,974	158,894	56,180	62,021	160,050
1926	21,506	36,221	161,261	53,511	60,525	134,444
1927	25,848	26,114	148,932	49,860	57,244	77,696
1928	32,168	27,332	168,830	65,418	73,416	145,486
1929	31,553	27,230	171,660	67,110	76,290	143,300
1930[c]	32,717	29,798	164,348	65,801	.....	124,104

* Data from *Statistisk Aarbog* (Denmark), *Statistisk arsbok för Sverige*, *Statistisk Arbok for Kongerikel Norge*, and for 1927–30 from U.S. Department of Agriculture's *Yearbook of Agriculture* and *Foreign Crops and Markets*. Quintals of grain were converted to bushels of grain by the use of the following factors: Wheat, 3.674333; rye, 3.9367857; oats, 6.889375; barley, 4.5929167; potatoes, 3.674333; mixed grain in Denmark, 5.9707917; mixed grain in Sweden, 5.731960; and mixed grain in Norway, 6.1238889.

[a] See footnote [a], Table III.

[b] Estimates of the U.S. Department of Agriculture for production within present boundaries.

[c] Preliminary.

TABLE V.—POPULATION, AND WHEAT AND RYE PRODUCTION, NET IMPORTS, AND DOMESTIC UTILIZATION (INCLUDING FLOUR) IN DENMARK AND IN SWEDEN, 1904–05 TO 1913–14, AND 1920–21 TO 1929–30*

(Million persons; million bushels; bushels per capita)

August–July[a]	Population[b]	Wheat				Rye			
		Crop	Net imports	Total domestic utilization	Per capita domestic utilization	Crop	Net imports	Total domestic utilization	Per capita domestic utilization
	DENMARK[c]								
1904–05	2.56	4.31	4.71	9.01	3.52	16.91	7.52	24.43	9.54
1905–06	2.58	4.07	4.92	8.99	3.87	19.22	5.91	25.13	9.74
1906–07	2.61	4.15	5.15	9.29	3.52	18.80	5.69	24.48	9.38
1907–08	2.65	4.35	4.90	9.26	3.49	15.85	5.61	21.45	8.10
1908–09	2.68	4.25	4.50	8.75	3.26	19.29	6.45	25.74	9.60
1909–10	2.72	3.77	6.02	9.80	3.60	19.04	8.34	27.38	10.06
1910–11	2.76	4.55	4.46	9.01	3.26	20.00	7.76	27.76	10.06
1911–12	2.79	4.47	6.64	11.11	3.98	19.71	7.15	26.86	9.63
1912–13	2.83	5.03	8.12	13.15	4.64	16.51	7.68	24.18	8.54
1913–14	2.86	6.70	8.04	14.73	5.15	17.00	8.44	25.45	8.90
1920–21	3.27	7.39	.35	7.74	2.37	13.24	(.26)	12.99	3.97
1921–22	3.31	11.14	4.01	15.15	4.58	12.20	2.41	14.62	4.42
1922–23	3.34	9.25	6.28	15.53	4.65	14.28	5.71	20.00	5.99
1923–24	3.37	8.86	9.28	18.13	5.37	15.14	9.52	24.67	7.31
1924–25	3.41	5.86	6.55	12.42	3.64	10.43	5.90	16.33	4.79
1925–26	3.44	9.75	6.00	15.75	4.58	13.74	8.27	22.01	6.40
1926–27	3.47	8.77	7.24	16.00	4.62	12.48	6.26	18.74	5.41
1927–28	3.49	9.41	10.96	20.37	5.84	10.36	6.97	17.34	4.97
1928–29	3.50	12.21	16.67	28.89	8.24	9.68	6.80	16.48	4.70
1929–30	3.52	11.77	7.98	19.76	5.61	10.41	10.93	21.34	6.06
	SWEDEN								
1904–05	5.27	5.25	8.14	13.39	2.54	21.16	5.98	27.15	5.15
1905–06	5.30	5.53	7.81	13.33	2.52	25.58	2.12	27.70	5.23
1906–07	5.36	6.69	7.18	13.87	2.59	27.00	.56	27.56	5.14
1907–08	5.40	6.18	7.40	13.58	2.52	21.03	2.88	23.91	4.43
1908–09	5.43	7.05	7.49	14.54	2.68	26.17	2.76	28.94	5.33
1909–10	5.48	7.41	7.45	14.86	2.71	25.64	3.99	29.63	5.41
1910–11	5.52	7.70	7.09	14.78	2.68	24.50	2.83	27.33	4.95
1911–12	5.56	8.11	5.22	13.33	2.40	24.28	1.81	26.09	4.69
1912–13	5.59	7.80	8.39	16.18	2.90	23.08	5.54	28.61	5.12
1913–14	5.62	9.50	7.23	16.73	2.98	23.01	4.64	27.64	4.92
1920–21	5.90	10.32	6.61	16.93	2.87	22.43	(1.57)	20.86	3.53
1921–22	5.95	12.34	3.85	16.19	2.72	26.56	(1.81)	24.75	4.16
1922–23	5.99	9.51	8.78	18.29	3.05	22.13	.55	22.68	3.79
1923–24	6.01	11.00	12.35	23.35	3.89	23.37	5.09	28.45	4.74
1924–25	6.04	6.80	10.58	17.38	2.88	10.88	4.26	15.14	2.51
1925–26	6.05	13.36	6.10	19.46	3.22	26.62	1.24	27.86	4.60
1926–27	6.07	12.15	6.02	18.17	2.99	23.09	(.80)	22.29	3.67
1927–28	6.09	15.84	8.42	24.25	3.98	15.14	3.36	18.50	3.04
1928–29	6.10	19.16	8.05	27.20	4.46	17.15	5.50	22.65	3.71
1929–30	6.12	19.03	7.32	26.35	4.30	16.28	5.06	21.34	3.49

* Production data from *Statistisk Aarbog* (Denmark) and from Appendix Tables II and IV; net import data from *International Yearbook of Agricultural Statistics*. Population figures in part from official sources, in part from *International Yearbook of Agricultural Statistics*, with slight adjustments to give consistent trends.

[a] Pre-war data for Denmark are for July–June.

[b] As of January 1, 1905, and subsequent years.

[c] Pre-war data for old boundaries.

TABLE VI.—POPULATION, AND WHEAT AND RYE PRODUCTION, NET IMPORTS, AND DOMESTIC UTILIZATION (INCLUDING FLOUR) IN NORWAY AND IN SCANDINAVIA, 1904–05 TO 1913–14, AND 1920–21 TO 1929–30*

(Million persons; million bushels; bushels per capita)

August-July[a]	Population[b]	Wheat				Rye			
		Crop	Net imports	Total domestic utilization	Per capita domestic utilization	Crop	Net imports	Total domestic utilization	Per capita domestic utilization
	NORWAY[c]								
1904-05	2.30	.21	2.58	2.80	1.22	.72	11.24	11.96	5.20
1905-06	2.32	.33	3.00	3.33	1.43	.98	9.83	10.81	4.66
1906-07	2.33	.30	3.00	3.30	1.42	.96	10.16	11.12	4.77
1907-08	2.34	.29	3.59	3.88	1.66	.82	8.52	9.34	3.99
1908-09	2.36	.33	3.36	3.68	1.56	.87	9.95	10.82	4.58
1909-10	2.37	.31	3.40	3.71	1.56	1.01	10.45	11.46	4.84
1910-11	2.39	.29	3.51	3.80	1.59	.90	10.45	11.34	4.75
1911-12	2.42	.27	4.03	4.30	1.78	.95	9.55	10.49	4.34
1912-13	2.44	.33	4.16	4.49	1.84	1.04	10.20	11.24	4.61
1913-14	2.47	.32	4.34	4.66	1.89	.97	10.15	11.13	4.50
1920-21	2.65	1.00	3.86	4.86	1.83	.97	6.12	7.09	2.67
1921-22	2.69	.97	5.16	6.14	2.28	1.04	7.11	8.15	3.03
1922-23	2.72	.64	6.90	7.54	2.78	.86	7.08	7.94	2.92
1923-24	2.73	.59	6.11	6.70	2.45	.74	8.06	8.81	3.22
1924-25	2.75	.49	5.57	6.06	2.20	.64	7.17	7.80	2.84
1925-26	2.77	.49	6.70	7.19	2.60	.61	7.91	8.52	3.08
1926-27	2.79	.59	6.22	6.80	2.44	.65	6.85	7.50	2.69
1927-28	2.80	.60	6.78	7.39	2.64	.61	7.11	7.71	2.76
1928-29	2.81	.80	9.15	9.95	3.54	.50	6.37	6.87	2.44
1929-30	2.82	.75	6.96	7.71	2.73	.54	6.44	6.98	2.47
	SCANDINAVIA								
1904-05	10.13	9.77	15.43	25.20	2.49	38.79	24.75	63.54	6.27
1905-06	10.20	9.93	15.72	25.65	2.51	45.79	17.86	63.64	6.24
1906-07	10.30	11.14	15.33	26.47	2.57	46.76	16.41	63.17	6.13
1907-08	10.39	10.82	15.90	26.72	2.57	37.70	17.00	54.70	5.26
1908-09	10.47	11.63	15.34	26.97	2.58	46.33	19.16	65.49	6.26
1909-10	10.57	11.50	16.87	28.37	2.68	45.68	22.78	68.46	6.48
1910-11	10.67	12.54	15.06	27.60	2.59	45.39	21.04	66.44	6.23
1911-12	10.77	12.84	15.89	28.74	2.67	44.94	18.50	63.44	5.89
1912-13	10.86	13.16	20.66	33.82	3.12	40.62	23.41	64.03	5.90
1913-14	10.95	16.52	19.60	36.13	3.30	40.98	23.23	64.22	5.86
1920-21	11.82	18.71	10.81	29.52	2.50	36.65	4.29	40.94	3.46
1921-22	11.95	24.45	13.03	37.48	3.14	39.80	7.71	47.52	3.98
1922-23	12.04	19.40	21.95	41.36	3.43	37.28	13.34	50.62	4.20
1923-24	12.11	20.45	27.73	48.18	3.98	39.25	22.67	61.93	5.11
1924-25	12.20	13.16	22.70	35.86	2.94	21.95	17.33	39.28	3.22
1925-26	12.27	23.60	18.81	42.40	3.46	40.97	17.42	58.40	4.76
1926-27	12.33	21.51	19.48	40.98	3.32	36.22	12.32	48.54	3.94
1927-28	12.37	25.85	26.16	52.01	4.20	26.11	17.44	43.55	3.52
1928-29	12.42	32.17	33.87	66.04	5.32	27.33	18.67	46.01	3.70
1929-30	12.47	31.55	22.26	53.82	4.32	27.23	22.43	49.66	3.98

* Production data for Norway from Tables II and IV; net import data from *International Yearbook of Agricultural Statistics*. Population figures in part from official sources, in part from *International Yearbook of Agricultural Statistics*, with slight adjustments to give consistent trends. Data for Scandinavia based partly upon Table V.

[a] Pre-war figures for Scandinavia include Danish data which are in terms of a July-June year.

[b] As of January 1, 1905 and subsequent years.

[c] Net imports of wheat into Norway during pre-war years partly estimated on basis of calendar year net imports. Prior to 1913–14 imports of wheat were not reported by crop years, though flour imports were.

TABLE VII.—PRODUCTION, NET IMPORTS, AND DOMESTIC UTILIZATION OF OATS AND BARLEY IN THE SCANDINAVIAN COUNTRIES, 1920–21 TO 1929–30*

(Million bushels)

August–July	Oats			Barley			Oats			Barley		
	Crop	Net imports	Domestic utilization	Crop	Net imports	Domestic utilization	Crop	Net imports	Domestic utilization	Crop	Net imports	Domestic utilization
	DENMARK						SCANDINAVIA					
1920–21..	50.79	0.13	50.93	24.71	(0.08)[a]	24.63	135.79	1.57	137.36	41.26	1.07	42.33
1921–22..	52.16	0.62	52.78	27.55	(1.21)[a]	26.34	140.19	(0.09)[a]	140.10	43.82	0.30	44.12
1922–23..	58.40	0.52	58.92	30.43	6.37	36.81	148.94	0.62	149.56	48.42	7.38	55.80
1923–24..	63.10	3.25	66.36	32.46	13.22	45.68	143.60	11.32	154.91	47.17	16.17	63.34
1924–25..	63.21	1.50	64.71	34.22	1.42	35.64	144.99	5.47	150.46	52.16	2.52	54.68
1925–26..	65.84	0.07	65.91	36.57	(0.52)[a]	36.06	158.89	3.52	162.41	56.18	0.47	56.65
1926–27..	60.33	1.63	61.96	33.42	0.99	34.41	161.26	1.54	162.80	53.51	0.35	53.86
1927–28..	60.86	1.51	62.37	36.08	(1.10)[a]	34.98	148.93	3.83	152.76	49.86	0.23	50.09
1928–29..	72.96	1.91	74.87	50.54	(1.87)[a]	48.67	168.83	5.68	174.52	65.42	(0.72)[a]	64.69
1929–30..	71.28	8.69	79.96	51.09	6.71	57.81	171.66	12.60	184.26	67.11	8.21	75.32
	SWEDEN						NORWAY[b]					
1904–05..	59.70	7.63	67.33	14.56	0.03	14.59	8.07	0.46	8.52	2.63	5.66	8.28
1905–06..	72.68	4.17	76.85	14.15	0.16	14.31	11.50	0.05	11.55	3.64	4.97	8.62
1906–07..	82.14	2.07	84.20	15.67	0.00	15.66	10.83	0.53	11.37	3.43	4.62	8.06
1907–08..	78.28	6.62	84.90	13.52	0.09	13.61	8.10	1.08	9.18	2.73	5.68	8.41
1908–09..	87.70	2.27	89.97	16.33	0.10	16.43	13.19	0.95	14.14	3.18	4.72	7.90
1909–10..	81.43	7.74	89.17	14.02	0.06	14.08	10.26	0.90	11.16	2.73	5.93	8.66
1910–11..	88.86	4.68	93.54	15.14	0.06	15.20	12.22	0.87	13.10	3.05	4.83	7.88
1911–12..	75.64	7.74	83.38	14.92	(0.39)[a]	14.54	10.01	0.79	10.80	2.68	4.33	7.01
1912–13..	87.77	1.81	89.57	14.16	(0.03)[a]	14.12	13.53	0.53	14.05	3.25	3.61	6.86
1913–14..	96.55	0.89	97.44	16.93	(0.07)[a]	16.86	13.68	0.47	14.14	3.37	4.04	7.41
1920–21..	69.91	1.33	71.25	11.18	0.30	11.48	15.08	0.11	15.19	5.38	0.85	6.23
1921–22..	75.07	(1.68)[a]	73.39	11.99	0.01	12.00	12.96	0.98	13.94	4.28	1.50	5.78
1922–23..	77.15	(0.64)[a]	76.52	13.50	(0.72)[a]	12.78	13.38	0.73	14.11	4.48	1.74	6.22
1923–24..	72.49	5.41	77.91	11.43	0.17	11.60	8.00	2.65	10.65	3.28	2.78	6.06
1924–25..	71.14	2.52	73.67	13.25	(0.52)[a]	12.74	10.64	1.45	12.09	4.69	1.61	6.31
1925–26..	81.01	2.02	83.03	14.43	(0.61)[a]	13.81	12.05	1.42	13.47	5.18	1.60	6.78
1926–27..	87.60	(0.77)[a]	86.83	14.97	(1.79)[a]	13.18	13.33	0.67	14.00	5.12	1.14	6.27
1927–28..	75.40	1.81	77.22	9.11	0.03	9.13	12.66	0.51	13.17	4.67	1.30	5.98
1928–29..	83.19	3.42	86.61	9.74	(0.04)[a]	9.70	12.68	0.35	13.03	5.13	1.18	6.32
1929–30..	88.24	3.39	91.63	11.48	(0.07)[a]	11.41	12.15	0.52	12.66	4.53	1.56	6.10

* Production and net import data from *International Yearbook of Agricultural Statistics.*

[a] Net export.

[b] Net imports of oats not available by crop years before 1913–14; for earlier years they are estimated on the basis of calendar year net imports.

TABLE VIII.—ESTIMATED PRODUCTION AND CONSUMPTION OF WHEAT FLOUR (AS WHEAT) AND OF RYE FLOUR (AS RYE) IN DENMARK, 1921–28*

(Million bushels; bushels per capita)

Calendar year	Wheat flour (as wheat)					Rye flour (as rye)				
	Reported production	Estimated production[a]	Net imports	Estimated consumption[a]	Per capita consumption[b]	Reported production	Estimated production[a]	Net exports	Estimated consumption[a]	Per capita consumption[b]
1921.....	6.25	6.44	1.42	7.86	2.39	6.92	8.65	.53	8.11	2.47
1922.....	6.54	6.74	2.41	9.15	2.75	5.89	7.36	.26	7.10	2.14
1923.....	6.61	6.85	2.51	9.35	2.79	6.72	8.40	.18	8.22	2.45
1924.....	7.50	7.73	1.60	9.32	2.75	7.50	9.38	.32	9.06	2.67
1925.....	7.39	7.62	1.56	9.18	2.68	6.86	8.57	.18	8.39	2.45
1926.....	6.51	6.72	2.81	9.53	2.76	7.14	8.92	.13	8.79	2.55
1927.....	5.79	5.97	3.29	9.26	2.66	7.02	8.77	.25	8.53	2.45
1928.....	5.59	5.76	4.00	9.77	2.79	7.50	9.37	.22	9.16	2.62

* Data of flour production from *Statistisk Aarbog;* net import figures from *International Yearbook of Agricultural Statistics.* Data of wheat flour production converted from 100 kilograms of flour to bushels of wheat by multiplying by the factor 5.24904; data of rye flour production converted from 100 kilograms of flour to bushels of rye by multiplying by 5.62407.

[a] Estimated on the assumption that the reported production of wheat flour represents about 97% of the total wheat flour produced in merchant mills; that the reported production of rye flour represents about 80% of the rye flour produced in merchant mills; and that the flour (as distinct from crushed grain) produced in custom mills is of negligible quantity (Statistiske Meddelelser *Produktionsstatistik, 1926,* p. 72).

[b] Calculated by the use of population figures estimated as of July 1 from the population data in Appendix Table V.

TABLE IX.—ESTIMATED PRODUCTION AND UTILIZATION OF WHEAT FLOUR (AS WHEAT) AND OF RYE FLOUR (AS RYE) IN SWEDEN, 1920–28*

(Million bushels; bushels per capita)

Calendar year	Wheat flour (as wheat)				Rye flour (as rye)			
	Reported production	Net imports	Estimated utilization[a]	Per capita utilization[b]	Reported production	Net imports	Estimated utilization[a]	Per capita utilization[b]
1920.....	11.17	.72	11.89	2.02	8.75	(.07)[c]	8.68	1.48
1921.....	11.66	1.35	13.01	2.19	7.53	(.35)[c]	7.18	1.21
1922.....	13.88	(.16)[c]	13.73	2.30	7.99	(.52)[c]	7.48	1.25
1923.....	14.65	.76	15.42	2.57	9.53	(.09)[c]	9.45	1.58
1924.....	15.43	1.01	16.44	2.73	9.85	.10	9.95	1.65
1925.....	15.01	.22	15.23	2.52	9.15	(.01)[c]	9.14	1.51
1926.....	14.58	.10	14.68	2.42	8.64	(.09)[c]	8.56	1.41
1927.....	13.98	.54	14.52	2.39	8.98	.00	8.99	1.48
1928.....	15.05	.70	15.75	2.58	9.21	.08	9.29	1.52

* Data of flour production from *Statistisk arsbok* and *Industri;* net import data from *International Yearbook of Agricultural Statistics.* Data of wheat flour production converted from tons of wheat flour to bushels of wheat by multiplying by the factor 52.4904; data of rye flour production converted from tons of rye flour to bushels of rye by multiplying by the factor 56.2407.

[a] Since there appears to be no official statement to indicate what proportion of the total flour production is represented by the reported production, the figures of flour utilization can not be taken as estimates of flour consumption.

[b] Calculated by the use of population figures estimated as of July 1 from the population data in Appendix Table V.

[c] Net export.

TABLE X.—IMPORT DUTIES ON WHEAT AND ON WHEAT FLOUR, AND RATIOS OF FLOUR DUTIES TO CORRESPONDING WHEAT DUTIES IN NORWAY AND IN SWEDEN, PRE-WAR AND 1920–30*

(Kronor; kroner; U.S. dollars; percentages)

Date	Import duty on				Ratio of wheat duty Ratio of to flour duty per 100 kilograms *(per cent)*
	Wheat per 100 kilograms *(kronor)*	Wheat per bushel[a] *(U.S. dollars)*	Wheat flour per 100 kilograms *(kronor)*	Wheat flour per barrel[a] *(U.S. dollars)*	
	SWEDEN				
Pre-war	3.70	.270	6.50	1.549	56.9
1919–Apr. 21, 1921	Free	Free	Free	Free	....
Apr. 21–30, 1921	4.07	.255–.262	7.00	1.431–1.475	58.1
May 1–31, 1921	5.23	.327–.338	8.60	1.756–1.814	60.8
June 1–30, 1921	6.02	.359–.378	9.65	1.881–1.978	62.4
July 1–31, 1921	3.86	.211–.230	6.75	1.206–1.317	57.2
Aug. 1–31, 1921	7.18	.376–.425	11.20	2.019–2.164	64.1
Sept. 1–30, 1921	7.21	.420–.440	11.25	2.139–2.244	64.1
Oct. 1, 1921–May 30, 1922	7.20	.446–.522	11.25	2.278–2.666	64.0
June 1, 1922, to date	3.70	.270	6.50	1.549	56.9
	NORWAY				
Pre-war	0.60	.043	2.00	.476	30.0
1917–June 30, 1922	.60	.020–.046	2.00	.212– .502	30.0
July 1, 1922–June 30, 1923	Free	Free	Free	Free	....
July 1, 1923–Feb. 26, 1924	.80	.029–.033	2.66	.311– .393	30.1
Feb. 26, 1924–Dec. 8, 1924	1.52	.054–.062	5.06	.592– .674	30.0
Dec. 8, 1924–Apr. 16, 1925	1.44	.059–.063	4.79	.640– .684	30.1
Apr. 16, 1925–June 11, 1925	1.36	.060–.063	4.52	.650– .684	30.1
June 11, 1925–Sept. 1, 1925	1.28	.059–.072	4.26	.638– .788	30.0
Sept. 1, 1925–Nov. 4, 1925	1.20	.064–.072	3.99	.695– .788	30.1
Nov. 4, 1925–July 10, 1926	1.12	.061–.069	3.72	.660– .745	30.1
July 10, 1926–Jan. 11, 1927	1.17	.070–.082	3.90	.759– .898	30.0
Jan. 11, 1927–May 14, 1927	1.08	.075–.077	3.60	.815– .837	30.0
May 14, 1927–July 1, 1927	3.40	.239–.240	7.20	1.652–1.662	47.2
July 1, 1927–July 11, 1927	3.20	.225–.225	6.60	1.519–1.516	48.5
July 11, 1927–Feb. 6, 1928	3.63	.255–.263	6.27	1.439–1.484	57.9
Feb. 6, 1928–June 22, 1928	3.30	.239–.241	5.70	1.347–1.358	57.9
June 22, 1928–July 1, 1929	Free	Free	1.05	.250	....
July 1, 1929, to date	Free	Free	Free	Free	....

* Data chiefly from *Commerce Reports* of the U.S. Bureau of Foreign and Domestic Commerce; *Foodstuffs 'Round the World*, published by the U.S. Department of Commerce; *Commercial Intelligence Journal* of the Canadian Department of Trade and Commerce; and *Board of Trade Journal* (Great Britain).

[a] Duties expressed in U.S. currency are shown as ranges, because of the fluctuations in exchange rates during the period. The lower limit of each range is based on the lowest daily exchange rate for the period and the upper limit on the highest daily rate. Exchange rates are for cable transfers in New York.

TABLE XI.—NET IMPORTS OF WHEAT FLOUR (AS WHEAT) COMPARED WITH TOTAL NET IMPORTS OF WHEAT AND FLOUR (AS WHEAT) INTO THE SCANDINAVIAN COUNTRIES, 1920–21 TO 1929–30, WITH PRE-WAR AVERAGES*

(Thousand bushels; percentages)

August–July	Denmark			Sweden			Norway		
	Net imports of		Percentage of net imports in form of flour	Net imports of		Percentage of net imports in form of flour	Net imports of		Percentage of net imports in form of flour
	Wheat and flour	Flour (as wheat)		Wheat and flour	Flour (as wheat)		Wheat and flour	Flour (as wheat)	
Average 1904–05 to 1913–14	5,745[a]	2,190[a]	38.1[a]	7,339	412	5.6	3,497[b]	2,673	76.4
1920–21	348	212	61.0	6,609	1,269	19.2	3,856	1,124	29.2
1921–22	4,009	2,590	64.6	3,854	159	4.1	5,163	2,129	41.2
1922–23	6,281	2,588	41.2	8,777	351	4.0	6,896	2,813	40.8
1923–24	9,275	2,220	23.9	12,346	1,233	10.0	6,108	2,964	48.5
1924–25	6,551	937	14.3	10,582	680	6.4	5,572	2,611	46.9
1925–26	6,002	2,312	38.5	6,102	(80)[c]	...	6,704	3,614	53.9
1926–27	7,237	3,218	44.5	6,021	356	5.9	6,218	2,849	45.8
1927–28	10,961	3,864	35.3	8,418	635	7.5	6,783	3,516	51.8
1928–29	16,671	3,647	21.9	8,046	699	8.7	9,154	4,486	49.0
1929–30	7,983	3,356	42.0	7,318	686	9.4	6,963	3,271	47.0

* Data from *International Yearbook of Agricultural Statistics*.

[a] July–June year; net imports into old boundaries.

[b] Net imports of wheat for 1904–05 to 1912–13 estimated on basis of calendar year net imports.

[c] Net export.

TABLE XII.—GROSS IMPORTS OF WHEAT AND FLOUR (AS WHEAT) INTO THE SCANDINAVIAN COUNTRIES, BY MONTHS, 1920–21 TO 1929–30, WITH PRE-WAR AVERAGES*

(Thousand bushels)

August–July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
						DENMARK						
1920–21	17	45	107	45	35	22	22	35	27	16	7	65
1921–22	528	360	750	417	347	162	62	68	220	607	492	307
1922–23	335	333	443	440	928	587	575	853	745	453	403	513
1923–24	408	691	672	957	1,376	1,057	688	701	686	988	870	338
1924–25	442	400	708	946	1,067	537	319	428	693	694	723	505
1925–26	596	315	644	1,017	861	387	381	403	482	584	798	317
1926–27	431	733	749	929	590	629	555	576	465	948	931	801
1927–28	418	798	663	942	1,178	816	915	1,177	1,191	953	998	1,159
1928–29	1,180	950	1,168	1,400	1,579	1,459	890	1,011	2,698	2,249	1,549	667
1929–30	723	764	1,019	900	659	638	453	462	686	605	634	725
Average												
1920–21 to 1924–25	346	366	536	561	751	473	333	417	474	552	499	346
1925–26 to 1929–30	670	712	848	1,038	973	786	639	726	1,104	1,068	982	734
1920–21 to 1929–30	508	539	692	799	862	629	486	572	789	810	740	540
						SWEDEN						
Average												
1904–05 to 1908–09[a]	520	740	808	749	649	380	242	384	676	773	662	608
1909–10 to 1913–14[a]	472	855	733	742	510	384	364	370	586	636	477	541
1904–05 to 1913–14[a]	496	797	771	745	580	382	303	377	631	705	570	574
1920–21	467	142	195	852	700	388	347	412	507	733	598	1,570
1921–22	558	953	283	438	325	230	83	223	295	148	600	433
1922–23	517	945	627	913	895	400	362	663	1,107	1,192	965	928
1923–24	696	1,194	1,336	1,268	1,006	821	372	748	1,382	1,356	1,135	1,347
1924–25	908	908	766	1,056	968	628	991	1,136	1,164	856	766	558
1925–26	870	651	542	710	628	425	300	510	422	495	595	626
1926–27	688	859	840	935	599	466	524	558	441	972	1,022	734
1927–28	826	1,107	958	866	1,012	568	716	903	1,139	931	664	444
1928–29	889	1,205	1,208	1,034	982	907	518	455	1,385	971	632	989
1929–30	1,019	1,113	966	897	1,109	652	825	406	401	601	421	801
Average												
1920–21 to 1924–25	628	828	642	906	778	493	431	637	891	859	813	968
1925–26 to 1929–30	859	987	903	888	866	604	577	566	758	794	667	719
1920–21 to 1929–30	744	908	772	897	822	548	504	602	824	826	740	843
						NORWAY						
Average												
1904–05 to 1908–09[b]	165	193	241	245	235	212	187	182	171	180	172	179
1909–10 to 1913–14[b]	202	218	299	338	331	252	208	232	222	224	217	237
1904–05 to 1913–14[b]	184	206	270	292	283	232	198	207	197	202	195	208
1920–21	877	213	308	532	662	188	57	0	0	0	453	572
1921–22	240	643	623	693	795	567	497	273	43	130	197	467
1922–23	782	472	803	655	820	565	247	415	243	508	745	657
1923–24	399	166	356	612	1,021	460	558	487	530	494	880	136
1924–25	126	348	916	917	525	354	704	644	150	309	450	146
1925–26	907	459	274	1,044	378	436	566	600	857	426	405	355
1926–27	320	471	675	441	817	721	346	674	421	213	580	543
1927–28	638	661	799	781	765	424	342	522	373	637	512	334
1928–29	654	848	726	1,002	1,043	650	422	945	674	707	688	799
1929–30	453	791	723	866	424	318	562	528	685	554	537	518
Average												
1920–21 to 1924–25	484	369	601	682	765	427	412	364	193	288	545	395
1925–26 to 1929–30	594	646	639	827	685	510	448	654	602	507	545	510
1920–21 to 1929–30	540	507	620	754	725	468	430	509	398	398	545	453

* Data from *International Yearbook of Agricultural Statistics* and *International Crop Report and Agricultural Statistics.*

[a] Wheat imports only.

[b] Flour imports only.

TABLE XIII.—ANNUAL GROSS IMPORTS OF WHEAT AND FLOUR (AS WHEAT) INTO THE SCANDINAVIAN COUNTRIES, BY SOURCES, 1920–29, WITH PRE-WAR AVERAGES*

(Thousand bushels)

Calendar Year	Total	United States	Canada	Argentina	Australia	Russia	Germany[a]	Others
				DENMARK				
Average 1905–09[b]	7,137	2,924	..[c]	282[d]	..[c]	521	3,175	235
1909–13[b]	7,128	2,472	153	132	..[c]	400	3,549	422
1920	1,437	369	14	994	..[c]	..[c]	..[c]	60
1921	2,687	2,014	351	17	..[c]	..[c]	143	162
1922	4,655	1,986	501	510	..[c]	..[c]	633	1,023
1923	8,503	3,516	917	1,151	..[c]	..[c]	2,132	786
1924	9,376	3,761	1,756	1,710	..[c]	7	1,794	348
1925	7,738	2,442	2,143	1,035	..[c]	4	1,604	510
1926	7,028	3,003	1,679	694	..[c]	31	940	682
1927	9,196	3,947	2,492	958	..[c]	40	1,064	696
1928	13,887	5,141	2,273	615	..[c]	..[c]	3,803	2,053
1929	14,940	6,439	2,945	669	..[c]	..[c]	2,689	2,197
				SWEDEN				
Average 1905–09	7,512	662	..[c]	811	72	1,443	3,529	994
1909–13	7,175	638	..[c]	487	54	2,391	2,122	1,483
1920	8,117	1,896	94	5,365	476	..[c]	..[c]	287
1921	7,109	4,106	431	458	14	..[c]	922	1,177
1922	5,937	3,473	1,287	363	..[c]	..[c]	350	464
1923	11,140	5,673	1,718	1,457	597	..[c]	833	862
1924	11,769	5,349	2,123	1,767	864	45	960	661
1925	9,480	3,377	1,776	1,012	830	..[c]	1,394	1,091
1926	7,288	3,313	1,184	299	108	654	1,270	462
1927	9,481	3,118	1,543	741	668	1,026	1,620	765
1928	10,640	2,597	3,167	1,100	957	26	2,072	719
1929	11,046	2,881	1,849	1,934	536	..[c]	2,409	1,437
				NORWAY				
Average 1905–09	3,211	536	20	195	..[c]	299	1,634	526
1909–13	3,618	1,419	139	122	..[c]	318	1,427	192
1920	5,787	1,840	..[c]	1,589	876	..[c]	..[c]	1,481
1921	4,268	2,910	644	111	602	..[c]	..[c]	2
1922	5,695	3,791	132	704	315	..[c]	331	421
1923	5,931	3,252	1,052	602	113	..[c]	577	335
1924	6,694	4,061	1,402	337	251	39	525	80
1925	5,781	2,377	1,646	469	288	198	595	207
1926	6,375	4,296	919	231	224	372	292	36
1927	7,142	4,058	1,513	529	..[c]	521	445	75
1928	7,413	3,018	2,694	518	91	..[c]	1,024	70
1929	8,159	2,680	2,503	1,161	56	..[c]	1,080	678

* Data from *Danmarks Vareindforsel og-udforsel, Handel* (Sveriges officiella statistik), and *Norges Handel*. Figures are for general imports for Denmark and Norway. Data do not include imports of grits and groats. Countries of source are not necessarily countries of origin; they are merely the countries from which the wheat was actually purchased.

[a] Includes imports from Great Britain into Norway. In case of Denmark and Sweden imports from Great Britain are included with imports from "other" countries.

[b] Old boundaries.

[c] No imports, or imports so small as to be of negligible size and hence included with imports from "other" countries.

[d] Includes other South American countries besides Argentina.

TABLE XIV.—MONTHLY AVERAGE PRICES OF WHEAT, RYE, OATS, BARLEY, AND CORN IN DENMARK, 1921–22 TO 1930–31*

(U.S. dollars per bushel)

August–July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
						WHEAT[a]						
1921–22	1.32	1.35	1.15	1.15	1.26	1.22	1.37	1.49	1.54	1.64	1.59	1.52
1922–23	1.44	1.23	1.20	1.27	1.35	1.34	1.32	1.31	1.32	1.35	1.36	....
1923–24	....	1.09	1.12	1.14	1.17	1.19	1.18	1.20	1.28	1.29	1.27	1.32
1924–25	....	1.55	1.68	1.71	1.78	1.91	1.92	1.87	1.82	1.96	1.96	....
1925–26	1.47	1.38	1.33	1.40	1.55	1.54	1.49	1.45	1.63	1.68	1.69	1.72
1926–27	....	1.40	1.45	1.52	1.48	1.48	1.51	1.50	1.52	1.67	1.75	....
1927–28	....	1.42	1.39	1.37	1.37	1.35	1.35	1.44	1.52	1.56	1.52	1.46
1928–29	1.41	1.13	1.17	1.19	1.19	1.21	1.27	1.26	1.23	1.20	1.14	1.26
1929–30	1.33	1.15	1.18	1.16	1.18	1.16	1.10	1.04	1.15	1.11	1.16	1.14
1930–31	1.15	.93	.84	.79	.82	....	....	....	....	....	....	....
						RYE						
1921–22	1.35	1.33	1.17	1.15	1.25	1.20	1.28	1.37	1.41	1.54	1.48	1.42
1922–23	1.36	1.01	1.06	1.08	1.21	1.21	1.17	1.13	1.13	1.14	1.09	....
1923–24	....	.95	.94	.94	.97	.98	.98	1.00	....	....	....	....
1924–25	....	1.25	1.53	1.52	1.57	1.69	1.70	1.66	1.57	....	1.49	....
1925–26	1.17	1.08	.99	1.00	1.09	.99	.97	.94	1.04	1.08	1.10	1.11
1926–27	....	1.12	1.19	1.27	1.25	1.27	1.33	1.32	1.33	1.51	1.55	....
1927–28	....	1.25	1.25	1.26	1.28	1.27	1.25	1.32	1.44	1.44	....	....
1928–29	....	1.08	1.14	1.17	1.13	1.13	1.17	1.18	1.16	1.11	1.05	....
1929–30	....	.93	.93	.91	.90	.85	.79	.75	....	....	....	....
1930–31	....	.61	....	....	....	....	....	....	....	....	....	....
						OATS						
1921–22	....	.61	....	.55	....	.61	....	.69	....	.79	....	.81
1922–23	....	.80	....	.57	....	.64	....	.64	....	.67	....	.66
1923–24	....	.68	....	.58	....	.62	.59	.58	.61	.59	.57	.58
1924–25	.62	.70	.71	.74	.75	.77	.77	.75	.78	.87	.89	.94
1925–26	.83	.65	.63	.63	.64	.62	.61	.58	.67	.67	.69	.69
1926–27	.64	.57	.58	.58	.56	.57	.60	.61	.65	.72	.79	.81
1927–28	.85	.72	.68	.69	.74	.73	.73	.78	.81	.87	.91	.91
1928–29	.87	.65	.61	.66	.65	.65	.67	.67	.66	.64	.61	.61
1929–30	.58	.57	.52	.51	.49	.47	.42	.41	.48	.44	.42	.44
1930–31	.50	.45	.43	.42	.42	....	....	....	....	....	....	....
						BARLEY						
1921–22	1.11	1.08	.92	.92	.98	.97	1.01	1.08	1.07	1.12	1.08	1.10
1922–23	1.12	.81	.84	.85	.88	.95	.97	.95	.94	.98	.97	....
1923–24	....	.82	.84	.88	.95	.96	.93	.96	1.06	1.06	1.05	1.05
1924–25	....	1.25	1.37	1.36	1.35	1.43	1.44	1.37	1.31	1.34	1.31	....
1925–26	1.20	1.14	1.02	1.00	1.04	1.00	.92	.90	.99	1.00	.97	1.02
1926–27	1.01	.96	1.06	1.10	1.09	1.10	1.12	1.11	1.14	1.27	1.31	1.32
1927–28	....	1.07	1.08	1.06	1.11	1.12	1.15	1.23	1.26	1.27	1.27	1.27
1928–29	1.26	.94	.95	.97	.96	.96	.98	.99	.97	.95	.91	.96
1929–30	.95	.88	.87	.86	.87	.83	.76	.72	.78	.73	.68	.70
1930–31	.72	.66	.65	.61	.63	....	....	....	....	....	....	....
						LA PLATA CORN						
1921–22	1.11	1.02	.85	.82	.93	.95	1.12	1.19	1.10	1.12	1.05	1.04
1922–23	1.04	1.02	1.04	1.07	1.08	1.07	1.03	1.04	1.09	1.09	1.04	1.05
1923–24	1.02	1.01	.97	1.00	1.03	1.04	1.09	1.13	1.20	....	.93	.95
1924–25	1.04	1.19	1.28	1.28	1.29	1.37	1.34	1.30	1.25	1.34	1.34	1.25
1925–26	1.31	1.20	1.11	1.12	1.20	1.12	1.02	.99	1.00	.97	.93	.93
1926–27	.93	.96	1.02	1.05	.98	.96	.96	.92	.93	.95	.97	.93
1927–28	.99	1.00	1.00	1.04	1.06	1.09	1.15	1.27	1.31	1.32	1.30	1.32
1928–29	1.18	1.04	1.12	1.18	1.20	1.22	1.27	1.26	1.22	1.18	1.07	1.17
1929–30	1.13	1.07	1.04	.99	.99	.92	.86	.82	.88	.80	.82	.80
1930–31	.86	.79	.69	.60	.62	....	....	....	....	....	....	....

* Data from *Statistiske Efterretninger* (January issues) and *Statistisk Aarbog*. Prices are for native Danish grains with the exception of corn; they are monthly averages of Tuesday quotations recorded at the Copenhagen Grain Exchange. Conversions made on basis of monthly average rates for cable transfers in New York.

[a] Wheat weighing 126 to 128 Danish punds per "Dutch weight" (59.04 to 59.82 pounds per Winchester bushel).

TABLE XV.—MONTHLY AVERAGE PRICES OF CEREALS IN SWEDEN, 1920–21 TO 1930–31*

(U.S. dollars per bushel)

August–July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
						SWEDISH WHEAT[a]						
1920–21	2.90[b]	2.69	2.63	2.44	2.06	2.12	1.91	2.00	2.06	2.19	2.26	1.92
1921–22	1.78	1.57	1.45	1.28	1.43	1.47	1.52	1.59	1.55	1.60	1.59	1.57
1922–23	1.58	1.26	1.27[cd]	1.39	1.43	1.43	1.45	1.50	1.56	1.60	1.59	1.55
1923–24	1.58	1.24	1.22[c]	1.23	1.24	1.25	1.32	1.33	1.34	1.36	1.39	1.46
1924–25	1.53	1.70[e]	1.95	1.97	2.01	2.14	2.21	2.16	1.94	2.02	1.98	....
1925–26	1.58[c]	1.46	1.43	1.49	1.68	1.79	1.77	1.71	1.86	1.91	1.89	1.90
1926–27	1.66[e]	1.66	1.73	1.77	1.72	1.75	1.76	1.72	1.74	1.86	1.93	1.95
1927–28	1.68	1.66	1.63	1.61	1.59	1.58	1.56	1.63	1.72	1.76	1.69	1.61
1928–29	1.54	1.35	1.34[e]	1.37	1.37	1.37	1.42	1.43	1.38	1.32	1.29	1.44
1929–30	1.44	1.36	1.33	1.33	1.35	1.36	1.32	1.27	1.28	1.27	1.39	1.38
1930–31	1.38	1.35	1.37	....	....	....	....	....	....	....	....	....
						IMPORTED WHEAT[f]						
1922–23	....	....	1.73	1.76	1.78	1.65	1.64	1.63	1.68	1.66	1.59	1.48
1923–24	1.43	1.47	1.48	1.45	1.43	1.45	1.44	1.42	1.43	1.46	1.50	1.68
1924–25	1.82	1.86	2.05	2.07	2.16	2.32	2.39	2.25	2.03	2.13	2.04	1.98
1925–26	2.04	1.88	....	....	....	....	....	1.79	1.92	1.94	1.93	1.97
1926–27	1.93	1.83	1.95	1.93	1.86	1.78	1.79	1.79	1.80	1.91	1.94	1.89
1927–28	1.92	1.88	1.81	1.80	1.77	1.76	1.72	1.77	1.85	1.88	1.81	1.75
1928–29	1.62	1.57	....	....	....	1.60	1.62	1.61	1.57	1.48	1.45	1.69
1929–30	1.69	1.64	1.58	1.59	1.66	1.63	1.48	1.39	1.47	1.43	1.39	1.33
1930–31	1.35	1.23	1.10	....	....	....	....	....	....	....	....	....
						RYE[g]						
1920–21	1.81[b]	1.71	1.63	1.59	1.57	1.68	1.68	1.86	1.98	2.09	2.13	1.77
1921–22	1.59	1.46	1.28	1.10	1.21	1.29	1.33	1.35	1.34	1.40	1.43	1.40
1922–23	1.33	1.06	1.01[cd]	1.10	1.12	1.11	1.11	1.13	1.16	1.16	1.13	1.14
1923–24	1.16	1.03	.99[c]	.99	1.00	1.00	1.00	1.01	1.02	1.03	1.07	1.13
1924–25	1.20	1.42[c]	1.79	1.78	1.82	1.93	1.99	1.95	1.73	1.78	1.72	....
1925–26	1.22[e]	1.15	1.11	1.12	1.20	1.20	1.16	1.16	1.28	1.30	1.28	1.28
1926–27	1.21[e]	1.28	1.39	1.41	1.37	1.39	1.47	1.46	1.46	1.62	1.70	1.69
1927–28	1.44	1.47	1.44	1.45	1.45	1.43	1.43	1.51	1.61	1.69	1.63	1.55
1928–29	1.50	1.28	1.31[e]	1.32	1.30	1.26	1.27	1.30	1.28	1.22	1.14	1.19
1929–30	1.16	1.11	1.08	1.07	1.06	1.02	.96	.91	.93	.91	.91	1.09
1930–31	1.08	1.05	1.07	....	....	....	....	....	....	....	....	....
						OATS						
1920–21	.91	.90	.86	.85	.82	.82	.72	.74	.78	.80	.84	.77
1921–22	.71	.56	.46	.44	.50	.53	.61	.64	.64	.68	.67	.64
1922–23	.64	.52	.46[d]	.48	.49	.51	.53	.55	.55	.58	.60	.61
1923–24	.66	.54	.52	.55	.55	.56	.56	.55	.55	.56	.55	.54
1924–25	.54	.55	.60	.61	.60	.62	.66	.67	.67	.69	.70	.69
1925–26	.64[e]	.56	.54	.55	.56	.57	.57	.56	.57	.58	.58	.57
1926–27	.57[e]	.51	.52	.52	.50	.50	.50	.49	.50	.56	.59	.58
1927–28	.58	.55	.55	.56	.56	.57	.60	.69	.74	.77	.76	.76
1928–29	.80	.58	.56[e]	.57	.57	.57	.57	.56	.54	.52	.49	.51
1929–30	.51	.51	.45	.44	.42	.40	.38	.35	.37	.37	.36	.36
1930–31	.38	.39	.34	....	....	....	....	....	....	....	....	....
						BARLEY						
1920–21	1.43[b]	1.36[b]	1.36[b]	1.36[b]	1.36	1.30	1.33	1.43	1.47	1.46	1.47	....
1921–22	1.20	1.12	.91	.84	.85	.87	.93	.97	.99	1.01	1.03	1.02
1922–23	.97	.79	.75[cd]	.78	.79	.79	.84	.87	.88	.94	.95	.95
1923–24	....	.82	.81	.88[e]	.93	.93	.93	.95	.96	.98	.95	.94
1924–25	.96	....	1.18[e]	1.14	1.16	1.21	1.27	1.26	1.20	1.19	1.23	1.22
1925–26	1.12[e]	1.00	.94	.93	.94	.94	.92	.89	.90	.90	.88	.89
1926–27	.89[e]	.87	.93	.97	.93	.94	.93	.92	.94	1.06	1.09	1.14
1927–28	....	1.10	1.15	1.17	1.16	1.17	1.18	1.30	1.44	1.46	1.46	....
1928–29	....	.99	.97[e]	.96	.96	.95	.97	.99	.95	.97	.94	.94
1929–30	.96	.86	.80	.78	.76	.74	.71	.70	.72	.72	.70	.69
1930–31	.71	.76	.72	....	....	....	....	....	....	....	....	....

* Data from *Ekonomisk översikt* (Kommerskollegium). Price quotations of Sweden's Allmänna Lantbrukssällskaps (Agricultural Union); prices are averages for several cities in different sections of the country—Malmö, Kalmar, Halmstad, Göteborg, Norrköping, Stockholm, Orebro.

[a] Native wheat weighing 77.6 kilograms per hectoliter (60.3 pounds per Winchester bushel). [b] Approximate.

[c] Grain of the new harvest, year's normal quality.

[d] Beginning of new series based upon a change of weights. For October and November, prices of the old series were respectively: Wheat—1.28, 1.39; rye—1.01, 1.09; oats—.50, .53; barley—.75, .77.

[e] Beginning of new series for Swedish wheat and rye based upon a change in weights. For October and November prices of the old series were respectively: Swedish wheat—1.34, 1.37; Rye—1.32, 1.31.

[f] C.i.f. prices, including duty, at Swedish harbor.

[g] Native rye weighing 72.8 kilograms per hectoliter (56.5 pounds per Winchester bushel).

TABLE XVI.—QUARTERLY AVERAGE PRICES OF WHEAT, RYE, OATS, AND BARLEY IN NORWAY, 1920–21 TO 1929–30*

(U.S. dollars per bushel)

July–June	July–Sept.	Oct.–Dec.	Jan.–Mar.	Apr.–June	July–Sept.	Oct.–Dec.	Jan.–Mar.	Apr.–June
	WHEAT				OATS			
1920–21	....	....	2.84	2.48	....	....	.98	.87
1921–22	2.10	2.10	2.12	2.22	.74	.74	.78	.84
1922–23	2.00	1.89	1.83	1.68	.77	.70	.65	.64
1923–24	1.63	1.48	1.35	1.49	.64	.61	.61	.69
1924–25	1.53	1.74	2.03	2.18	.69	.74	.77	.89
1925–26	2.34	2.01	2.07	2.06	.95	.74	.74	.78
1926–27	2.01	2.15	2.09	2.05	.74	.72	.74	.74
1927–28	2.08	1.98	1.97	2.01	.76	.75	.78	.83
1928–29	1.94	1.77	1.80	1.80	.81	.73	.74	.75
1929–30	1.79	1.80	....	....	.72	.67	...	...
	RYE				BARLEY			
1920–21	....	....	2.38	2.13	....	....	1.69	1.50
1921–22	1.77	1.78	1.84	1.86	1.25	1.28	1.34	1.40
1922–23	1.73	1.55	1.52	1.38	1.30	1.23	1.19	1.11
1923–24	1.35	1.21	1.10	1.23	1.08	.97	.94	1.05
1924–25	1.25	1.44	1.65	1.79	1.06	1.21	1.28	1.43
1925–26	1.86	1.56	1.57	1.58	1.54	1.27	1.26	1.24
1926–27	1.54	1.66	1.67	1.64	1.20	1.25	1.24	1.25
1927–28	1.63	1.58	1.58	1.67	1.26	1.27	1.30	1.35
1928–29	1.68	1.53	1.54	1.53	1.33	1.23	1.23	1.24
1929–30	1.49	1.44	....	....	1.21	1.14	....	....

* Data from *Statistisk Arbok for Kongeriket Norge.* Prices are average prices for native Norwegian grain in the various production districts. Conversions made on basis of quarterly average rates for cable transfers in New York.

TABLE XVII.—LIVESTOCK POPULATION IN THE SCANDINAVIAN COUNTRIES, PRE-WAR AND 1920–29*

(Thousand head)

Year	Denmark				Sweden				Norway			
	Pigs	Cattle	Sheep	Horses	Pigs	Cattle	Sheep	Horses	Pigs	Cattle	Sheep	Horses
Pre-war[a]	2,497	2,463	407	567	978	2,723	972	596	307	1,089	1,391	164
1920	1,116	2,504	540	602	1,011	2,736	1,568	728	...	...	...	...
1921	1,430	2,591	522	598	...	...	...	...	...	...	...	...
1922	1,899	2,525	442	576	...	...	...	...	...	...	...	...
1923	2,855	2,523	374	562	...	...	...	...	237	1,131	1,525	193
1924	2,868	2,667	302	548	...	...	...	...	249	1,114	1,507	186
1925	2,517	2,758	261	536	...	...	...	...	253	1,151	1,529	184
1926	3,122	2,838	233	548	...	...	...	...	303	1,200	1,595	183
1927	3,731	2,913	...	525	1,387	2,899	708	620	300	1,209	1,608	183
1928	3,363	3,016	...	519	1,369	2,898	806	628	283	1,221	1,654	182
1929	3,616	3,031	191	521	...	...	...	...	289	1,224	1,533	177
1930	4,928	3,101	...	516	...	...	...	...	339	1,251	1,588	177

* Data from *Statistisk Aarbog* (Denmark), *Statistisk arsbok för Sverige, Statistisk Arbok for Kongeriket Norge,* and *International Crop Report and Agricultural Statistics.*

[a] 1914 for Denmark, 1913 for Sweden, and 1907 for Norway.

TABLE XVIII.—DOMESTIC UTILIZATION OF SPECIFIED FEED GRAINS AND SPECIFIED BREAD GRAINS IN THE SCANDINAVIAN COUNTRIES, 1920–21 TO 1929–30*

(Million pounds; thousand bushels)

Year	Feed grains						Bread grains		
	Total (million pounds)	Corn (thousand bushels)	Corn (million pounds)	Oats (million pounds)	Barley (million pounds)	Mixed grain (million pounds)	Total (million pounds)	Wheat (million pounds)	Rye (million pounds)
	DENMARK								
1920–21	4,321.54	12,564	703.58	1,629.66	1,182.05	806.25	1,191.50	464.28	727.22
1921–22	.....[a]	.....[a]	.....[a]	1,688.83	1,264.27	809.60	1,727.68	909.24	818.44
1922–23	5,270.84	13,996	783.78	1,885.60	1,766.64	834.83	2,051.63	931.80	1,119.83
1923–24	6,044.34	13,421	751.58	2,123.39	2,192.54	976.83	2,469.33	1,087.98	1,381.35
1924–25	6,027.53	21,251	1,190.06	2,070.59	1,710.82	1,056.06	1,659.60	744.90	914.70
1925–26	5,800.34	15,022	841.23	2,109.12	1,730.78	1,119.20	2,177.67	945.00	1,232.67
1926–27	6,174.73	26,136	1,463.62	1,982.88	1,651.58	1,076.65	2,009.96	960.24	1,049.72
1927–28	6,208.73	23,369	1,308.66	1,995.84	1,678.90	1,225.33	2,192.90	1,222.14	970.76
1928–29	7,133.81	12,842	719.15	2,395.84	2,336.26	1,682.56	2,656.26	1,733.10	923.16
1929–30	7,614.50	10,347	579.43	2,558.78	2,774.69	1,701.59	2,380.45	1,185.30	1,195.15
	SWEDEN								
1920–21	3,994.41	3,030	169.68	2,279.90	550.85	993.98	2,184.19	1,015.86	1,168.33
1921–22	4,216.53	3,452	193.31	2,348.42	576.19	1,098.61	2,357.28	971.34	1,385.94
1922–23	4,266.63	1,875	105.00	2,448.54	613.39	1,099.70	2,367.42	1,097.40	1,270.02
1923–24	4,324.11	3,386	189.62	2,492.99	556.90	1,084.61	2,994.37	1,401.06	1,593.31
1924–25	4,270.07	3,844	215.26	2,357.44	611.28	1,086.09	1,890.93	1,042.92	848.01
1925–26	4,730.40	4,072	228.03	2,657.06	662.98	1,182.33	2,727.76	1,167.66	1,560.10
1926–27	4,852.04	4,824	270.14	2,778.56	632.83	1,170.50	2,338.74	1,090.44	1,248.30
1927–28	4,235.12	7,673	429.69	2,470.94	438.43	896.05	2,491.24	1,455.18	1,036.06
1928–29	4,569.42	5,214	291.98	2,771.58	465.74	1,040.11	2,900.52	1,632.06	1,268.46
1929–30	4,848.92	4,150	232.40	2,932.13	547.87	1,136.52	2,776.15	1,580.94	1,195.21
	NORWAY								
1920–21	961.57	2,343	131.21	485.95	298.99	45.42	688.17	291.30	396.87
1921–22	995.94	4,148	232.29	446.02	277.39	40.25	824.67	368.10	456.57
1922–23	963.64	3,193	178.81	451.62	298.46	34.76	897.15	452.34	444.81
1923–24	871.21	3,832	214.59	340.80	290.93	24.89	894.84	401.70	493.14
1924–25	910.01	3,381	189.34	386.82	302.69	31.17	800.98	363.90	437.08
1925–26	1,044.12	4,512	252.67	431.01	325.58	34.85	909.04	431.64	477.40
1926–27	1,059.18	4,939	276.58	448.13	300.86	33.60	828.24	408.24	420.00
1927–28	1,011.29	4,921	275.58	421.50	286.85	27.36	875.21	443.28	431.93
1928–29	961.47	3,791	212.30	417.06	303.22	28.90	981.84	597.12	384.72
1929–30	983.01	4,669	261.46	405.28	292.66	23.61	853.55	462.78	390.77
	SCANDINAVIA								
1920–21	9,277.52	17,937	1,004.47	4,395.52	2,031.89	1,845.64	4,063.86	1,771.44	2,292.42
1921–22	.....[a]	.....[a]	.....[a]	4,483.26	2,117.86	1,948.45	4,909.63	2,248.68	2,660.95
1922–23	10,501.12	19,064	1,067.58	4,785.76	2,678.50	1,969.28	5,316.20	2,481.54	2,834.66
1923–24	11,239.66	20,639	1,155.78	4,957.18	3,040.37	2,086.32	6,358.54	2,890.74	3,467.80
1924–25	11,207.61	28,476	1,594.66	4,814.85	2,624.78	2,173.32	4,351.51	2,151.72	2,199.79
1925–26	11,574.85	23,606	1,321.94	5,197.18	2,719.34	2,336.39	5,814.48	2,544.30	3,270.18
1926–27	12,085.94	35,899	2,010.34	5,209.57	2,585.28	2,280.75	5,176.94	2,458.92	2,718.02
1927–28	11,455.13	35,963	2,013.93	4,888.29	2,404.18	2,148.74	5,559.34	3,120.60	2,438.74
1928–29	12,664.70	21,847	1,223.43	5,584.48	3,105.22	2,751.57	6,538.62	3,962.28	2,576.34
1929–30	13,446.43	19,166	1,073.30	5,896.19	3,615.22	2,861.72	6,010.15	3,229.02	2,781.13

* Data from same sources as Table IV, with the exception of corn utilization figures which are net import figures calculated from the cumulative monthly import data published in *International Crop Report and Agricultural Statistics.*

[a] Date of corn imports into Denmark, 1921–22, not available.

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