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GRAIN-LIVESTOCK ECONOMY OF THE EUROPEAN COMMUNITY: A HISTORICAL REVIEW, 1951-63. (Foreign Agricultural Economic Report), Washington, DC: Economic Research Service. Jul. 1966.

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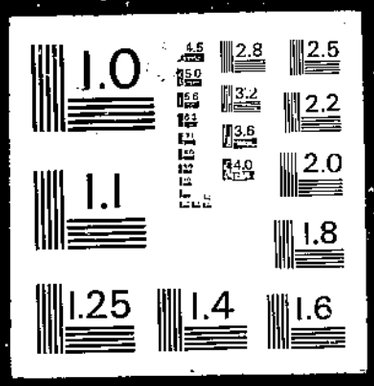

FOREIGN AGRICULTURAL ECONOMIC REPORT No. 31

THE GRAIN-LIVESTOCK ECONOMY OF THE EUROPEAN ECONOMIC COMMUNITY: A HISTORICAL REVIEW, 1951-63

ECONOMIC RESEARCH SERVICE
U. S. DEPARTMENT OF AGRICULTURE

PREFACE

This is the second report of the Task Force set up under Economic Research Service General Memorandum No. 20, August 1963. Its terms of reference were:

"(1) To develop country impact studies which will show the expected effects for selected countries of impacts on their commodity trade balances and internal economic conditions in agriculture arising from reduction in tariffs and other impediments to agricultural product imports; and

(2) To establish the general framework within which commodity analyses are accomplished; to provide for consistency as between commodity analyses; and to make overall assessments of the policy positions that emerge."

This report attempts to outline an economic framework for the study of problems defined by these terms of reference. The analysis purports to answer few questions. Instead its purpose is to raise some penetrating questions that should be the subject of future research directed to reaching a full understanding of the European Economic Community as a market for U.S. grain and livestock products.

Only a partial appendix of data sources appears in this report. Most of the basic data underlying the charts originate from a companion document previously published under the title, The Grain-Livestock Economy of the European Economic Community: A Compendium of Basic Statistics, U.S. Department of Agriculture, Economic Research Service, Statis. Bul. 351, Nov. 1964. Documentation in the text, however, consists largely of data sources other than Statistical Bulletin 351.

The work was conducted by personnel from several divisions of the Economic Research Service:

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Helen Clifton, Foreign Development and Trade Division, assisted with the statistical compilation and computation.

The assistance and comments of a number of individuals in the Foreign Agricultural Service and Economic Research Service are gratefully acknowledged.

Washington, D.C. July 1966

TABLE OF CONTENTS

	Page
SUMMARY	v
INTRODUCTION	1
Scope of This Analysis	1
AGRICULTURE IN GENERAL	3
The Economic Environment	3
Farm Inputs and Technology	9
Agricultural Policy in the 1950's	14
PRODUCTION AND CONSUMPTION OF MEATS	16
Production of Meats	22
The Basic Herd	22
Livestock Slaughter and Carcass Weight	25
Consumption of Meats	27
Livestock Prices	30
PRODUCTION AND CONSUMPTION OF GRAINS	30
Production of Grains	33
Consumption of Grains	38
PRODUCTION AND CONSUMPTION OF FORAGE	44
Production of Forage	44
Consumption of Forage	49
APPENDIX	52

SUMMARY

The European Economic Community (EEC) represents the most important commercial overseas market for American farm products. In 1963, the United States sold nearly $1.2 billion worth of agricultural products to the Community. The largest component of this total was grain and grain products, valued at about $360 million.

Future size of this market can depend heavily on agricultural policy developments in the Community that directly affect the size of the import market for many products.

The agriculture of the EEC was extremely prosperous and dynamic from 1951 to 1963. For the most part, prices received by farmers rose or remained constant throughout this period, while agriculture continued to respond to improved technology and appropriate resource adjustments.

The general economic conditions surrounding agriculture were favorable and contributed heavily to the steady agricultural growth. In 1963, industrial output was 68 percent higher than the average in 1953-57. Increases in agricultural output for the same period were significantly slower than those for industrial output. The increases in agricultural output ranged from a low of 18 percent for Italy and Belgium-Luxembourg to a high of 27 percent for France.

The mixture of land, labor, and capital used in agricultural production has undergone considerable transformation in the past decade or so. While the area of land used in farming has remained virtually constant, the amount of labor used has declined severely and has been replaced by increasing amounts of capital. These changes in resources used and the adoption of yield-increasing technology were the principal factors contributing to the general increase in farm output.

During most of the 1951-63 period, there was a very modest gap between production and consumption of meats. Net imports of meat by the Community remained about constant between 1956 and 1961. The Community was 96 percent self-sufficient in total meats, and imports were a small proportion of total domestic consumption. Meat imports by West Germany and Italy increased during this period. On the other hand, exports from the Netherlands increased, and France switched from a relatively large meat importer to a small meat importer.

Consumption of meats increased markedly in response to increases in prosperity in each of the EEC countries. For the Community as a whole, total meat consumption per person went up from nearly 46 kilograms in 1956 to about 54 kilograms in 1961, an increase of over 17 percent in the 5-year period. Total meat consumption increased by 23 percent as a result of population growth. In France, the comparable figures were 12 and 16 percent; in West Germany, 18 and 28 percent; in Italy, 38 and 41 percent; in the Netherlands, 13 and 20 percent; and in Belgium-Luxembourg, 8 and 11 percent.

Historically, the EEC has been deficit in grains. Data for the most recent decade show that the deficit has remained annually in the vicinity of 9.5 to 10.5 million metric tons. West Germany has constantly had the greatest deficit, varying annually from 3 to 5 million metric tons. In recent years, however, the Italian deficit has grown almost as large as that of West Germany. This stands in sharp contrast to Italy's near self-sufficiency prior to 1960. The rapidly rising demand for feed grains in Italy has been one of the most important factors contributing to this growing deficit. France has been a surplus producer of grain, and during the 1951-63 period the size of the French grain surplus increased.

Forage, an important element of the EEC's agriculture, is the base upon which a large part of the production of livestock and livestock products takes place. Forage-consuming livestock also consumes significant amounts of grain. In general, there is a very wide range of substitutions between the two types of feed in the production of these animals. In the past,

economic conditions seemed to favor forage production, so that resources were diverted from grain and other crops to forage. Changes in the production of forage in the Community were dominated by changes in yield, but changes in area also played a significant role.

The demand for forage is based on the number of forage-consuming animal units and forage-feeding rates. The number of forage-consuming units increased from slightly over 47 million in 1952 to nearly 52 million in 1962--an increase of slightly over 9 percent. Total forage consumption per animal unit went up sharply in France, West Germany, and Italy during this period; the increases were 30, 27, and 34 percent, respectively. There were slight declines of 3 percent in the Netherlands and 4 percent in Belgium-Luxembourg.

THE GRAIN-LIVESTOCK ECONOMY OF THE EUROPEAN ECONOMIC COMMUNITY: A HISTORICAL REVIEW, 1951-63

Foreign Development and Trade Division
Economic Research Service

INTRODUCTION

The six countries of the European Economic Community (EEC) represent the most important commercial overseas market for American farm products.[1] In 1963, the United States sold nearly $1.2 billion worth of agricultural products to the Community. The largest component of this total was grain and grain products, valued at about $360 million.[2] The future size of the market can depend heavily on agricultural policy developments in the Community that directly affect the size of the import market for many products.

The creation of the EEC has proven to be one of the most courageous attempts to bring economic and political unity to a group of predominantly nationalistic countries. The difficulty of merging six separate traditions of culture and customs is enhanced by the problem of achieving fluidity in exchange among nations with varied endowments of human and natural resources and with divergent views on how these should best be employed.

After nearly a decade, much progress has been made. Many of the problems envisaged prior to inception have been solved, some have not materialized, and many more have erupted since.

The problems of agricultural integration have not yet been fully resolved, but the Community has gone a long way toward doing so. Countries within the EEC have reached considerable agreement in a number of commodity areas. Many of the regulations governing intra-Community trade for agricultural products have been agreed upon. In December 1964, the basis for a common price policy for grains was adopted. The details of the policy have not been worked out yet, but the broad structure of prices is known. A common price policy for livestock and a price structure are expected to be agreed upon in the near future. Many of these prices must of necessity be tied closely to those adopted for grain.

Scope of This Analysis

Many agricultural policy questions remain unanswered. This analysis does not attempt to predict the direction which the agricultural policy of the six members might take; this policy will be a product of social and political compromise by the countries involved. Instead, this analysis attempts to focus on the economic relations that influenced agriculture in the EEC from 1951 to 1963, with the main emphasis on the grain-forage-livestock complex. The report will try to specify as closely as possible the important variables that influence the demand and output of the major farm products and to show the relations that exist among them. In cases of inadequate data or lack of knowledge about the structure of the grain-forage-livestock economy, questions or hypotheses to be tested in the future will be posed.

The specific province of this report is to review trends in the production and consumption patterns of the important grain and livestock products during the 1950's. It will also examine the trends in variables, such as prices, incomes, population movements, technological

[1] The EEC is comprised of France, West Germany, Italy, Netherlands, Belgium, and Luxembourg. It was founded by the Treaty of Rome, ratified in December 1957.

[2] Economic Research Service. Foreign Agricultural Trade of the United States. U.S. Dept. Agr., Washington, D.C., Oct. 1964.

advances, and where possible try to point out their association with production and consumption. Although no predictions of production and consumption will be attempted, the results of this historic review should prove useful to those who are engaged in this type of work. Furthermore, a study of this nature should elucidate considerably the nature of the mainstream of agriculture in the six countries of the EEC and the economic problems that they may encounter in their attempts to attain free exchange with each other.

Whereas this study does not address itself to any specific problem, it will provide a description of and, where possible, suggest the magnitudes of some of the important coefficients in the grain-livestock sector during the years 1951 to 1963. From this study, researchers may gain insights into what changes have taken place in a major portion of the Community's agriculture, which of these changes can be explained by economic logic, which can be measured with available data, and which cannot be explained by the limited information available and for which more information is needed. This study should prove useful to other analysts as a basis for investigating policy questions that may arise, and as a source of data that could be used for making projections.

From the data available, it would be virtually impossible to construct and estimate reliable parameters of a complete econometric model of the grain-forage-livestock economy of the EEC. To be minimally acceptable for studies of these markets, an econometric model would have to define the key supply and demand relations within each of the three sectors (fig. 1).[3] But there are several difficulties. First, a sufficient number of observations is

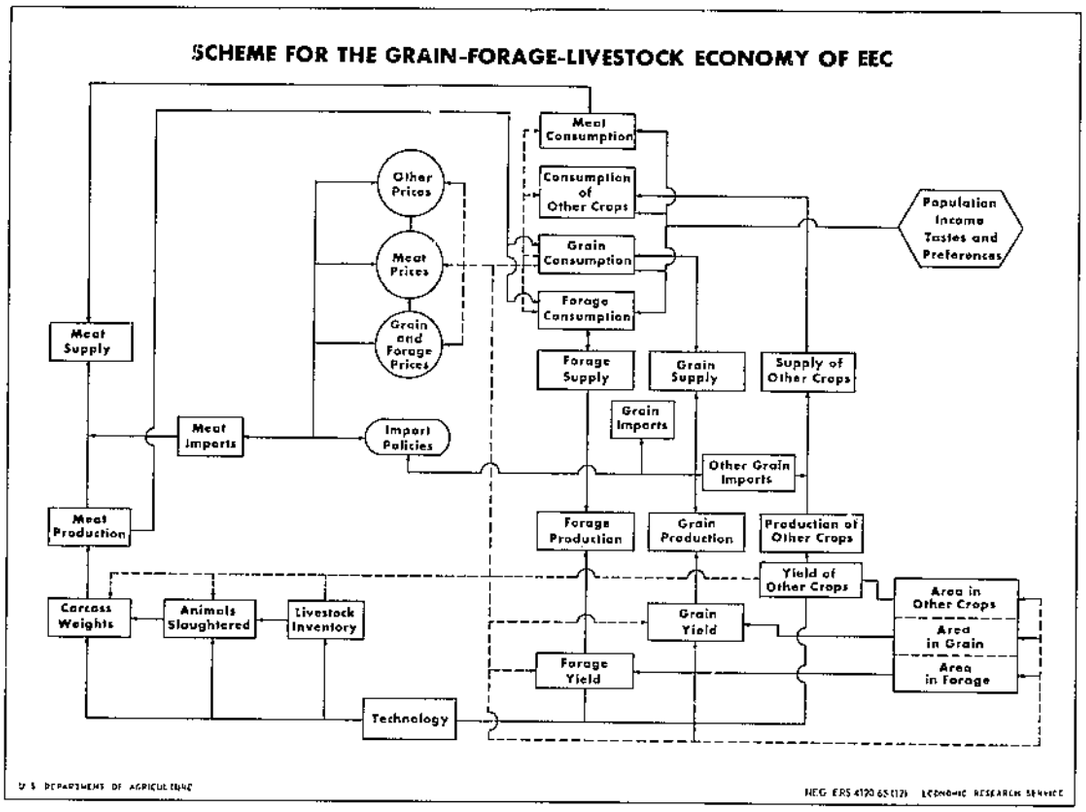

Figure 1

[3] The following interpretation can be made of the scheme: Circles contain price variables, nonprice variables are represented by squares, rectangles, etc., solid lines represent the influence of nonprice variables, dotted lines represent the influence of price variables, single arrows represent a one-way direction of effect, and double arrows represent either a two-way direction of effect or identities.

not available. However, as more data are gathered, this constraint will become less important. Second, although a great deal is known about many of the individual relationships that might enter such a model, there is insufficient information to bind what is known into an overall consistent economic framework. Time cannot cure this insufficiency. Thus, researchers could perform a useful task by elucidating the important unknowns, providing that they are mindful that such detail should be consistent with the larger view.

AGRICULTURE IN GENERAL

The agriculture of the European Economic Community was extremely prosperous throughout the 1950's and the early 1960's. For the most part, prices received by farmers rose or remained constant throughout this entire period, while agricultural output continued to respond to improved technology and appropriate resource adjustments.

The Economic Environment

Although much of the stimulus for prosperity came from within agriculture itself, the more general economic conditions surrounding agriculture were highly favorable and contributed heavily to the steady agricultural growth. Some indication of the progress of the nonagricultural sector is provided in the index of industrial output which has increased markedly in all countries of the EEC. Using the average output of the 1953-57 period as a benchmark, the output of nonagricultural industries was 68 percent higher in 1963 than in the base period (fig. 2). Actually, this reflects a rapid and almost uninterrupted growth that has characterized the industries of these countries for more than a decade.

The most rapid relative rates of increase in industrial output took place in France and Italy. In each case, the 1953 index was just over 80 points; by 1963, the index had risen to 164 points for France and 203 for Italy--gains of 2 and $2\frac{1}{2}$ times, respectively. These industrial advances stand in sharp contrast to the lower percentage rate of growth in West Germany; here the increase for the same period was from 86 to 124 index points--gains of about $1\frac{1}{2}$ times. The three small countries of the Netherlands, Belgium, and Luxembourg displayed intermediate industrial growth rates.

The industrial output of most countries of the EEC showed comparatively little difference in growth rate between the early and latter parts of the study period. The one major exception was West Germany where the expansion of industrial output was more rapid in the early 1950's than in the late 1950's and early 1960's.

The growth of agricultural output in the EEC as a whole was also quite substantial; however, it was slow compared with the growth of industrial output. Whereas the Community's industrial output doubled, agricultural output increased by less than one-third during the period of observation (fig. 2).

The long-run average rate of growth in the index of farm output was about the same for each of the countries of the EEC, but the year-to-year movements within each country were quite different from those of the aggregate. For example, 1960 was a comparatively good year in Italy and the Netherlands, but a poor year in West Germany and Belgium-Luxembourg, and only an average year in France. In other words, the annual fluctuation in farm output in the individual countries did not run concurrently, so that in the aggregate the annual fluctuations in output were much less extreme than in the individual cases. Some of the different fluctuations of farm output among the individual countries were due to planned changes in output; but some were also due to uncontrollable variables such as the effects of weather. This points to one of the key advantages of economic integration: the output of a large geographic region stands less chance than its individual members of being significantly affected by major changes in uncontrollable influences on production.

The joint growth of agricultural and industrial output led to a high level of employment in the EEC and generated sharply increasing per capita incomes during the 1950's (fig. 3).

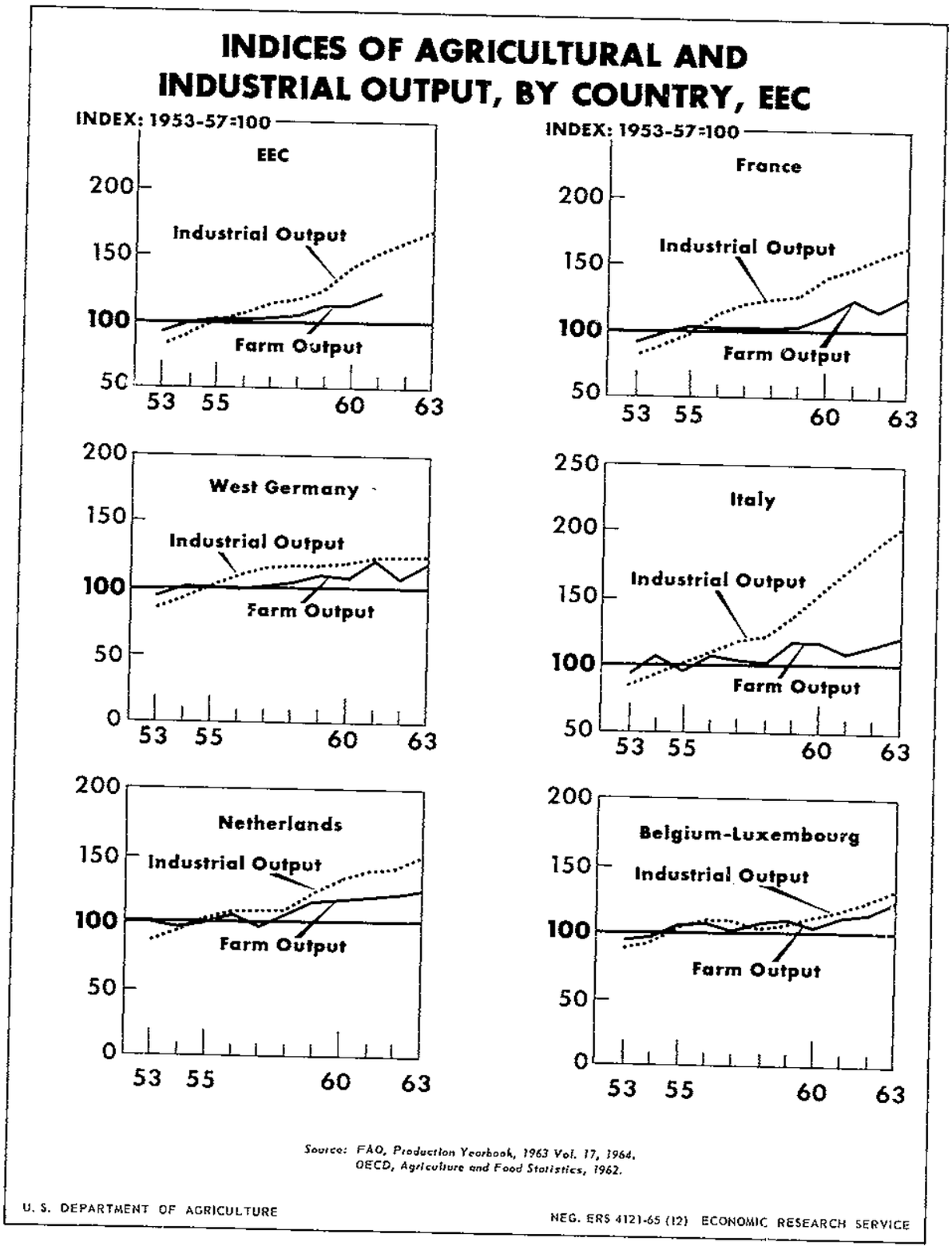
INDICES OF AGRICULTURAL AND INDUSTRIAL OUTPUT, BY COUNTRY, EEC
INDEX: 1953-57=100
EEC
Industrial Output
Farm Output
200
150
100
50
53
55
60
63
INDEX: 1953-57=100
France
Industrial Output
Farm Output
West Germany
Industrial Output
Farm Output
0
Italy
Industrial Output
Farm Output
250
Netherlands
Industrial Output
Farm Output
Belgium-Luxembourg
Industrial Output
Farm Output
Source: FAO, Production Yearbook, 1963 Vol. 17, 1964.
OECD, Agriculture and Food Statistics, 1962.
U. S. DEPARTMENT OF AGRICULTURE
NEG. ERS 4121-65 (12) ECONOMIC RESEARCH SERVICE

Figure 2

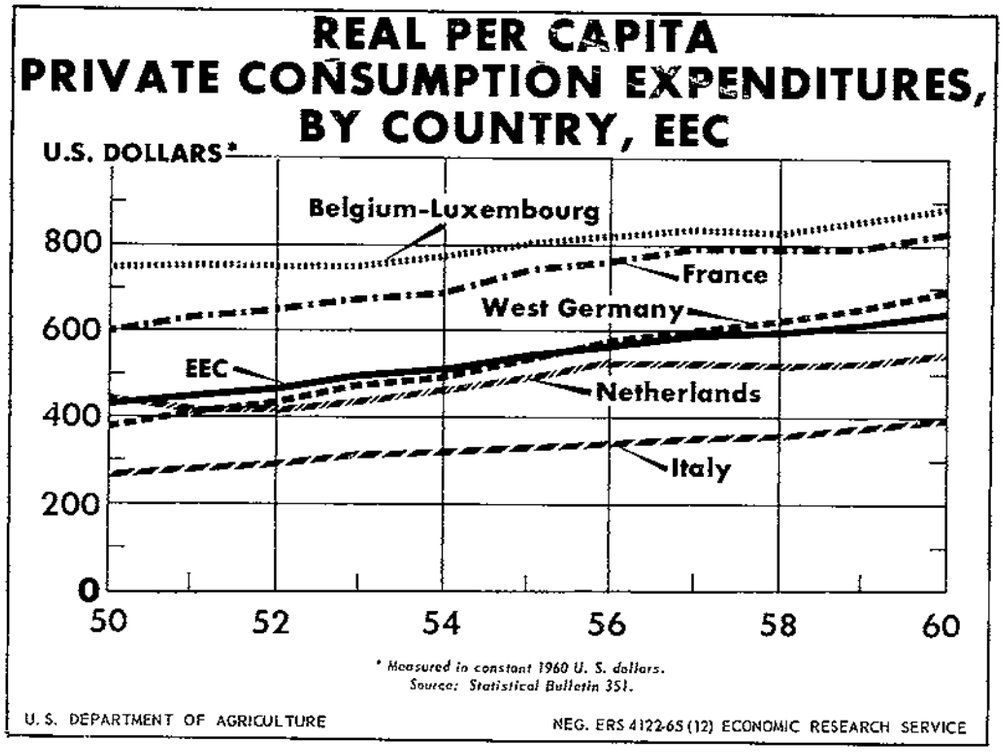

Figure 3

In 1950, the average per capita private consumption expenditure (measured in terms of 1960 U.S. dollars) for the six-country complex was $430.[4]

In 1960, after an uninterrupted succession of annual increases, the average per capita income reached $645--a real increase of 50 percent in 10 years. This was a major factor in maintaining a strong demand for farm products and in forming a basis for a progressive agriculture in the EEC.

The dispersion of national incomes about the Community mean continued to be quite wide throughout the 1950's, even though each of the countries contributed materially to the overall increase in the real incomes of consumers. In 1960, the average per capita income in Italy was only $400; this continued to be the lowest income of any of the six countries, as it was in 1950 when Italy's level was only $270. In contrast, the average per capita income for Belgium-Luxembourg in 1960 continued to hold the lead with $880. But French incomes were gaining rapidly; by 1960, they reached an average of $830. The fastest rate of increase in real per capita income during the 1950's occurred in West Germany; it rose at an average rate of $31 per year. This compares with $24 per year for France, $13 per year for Italy and Belgium-Luxembourg, and $11 per year for the Netherlands.

The foregoing gains in per capita income suggest that total private consumption expenditures of each of the six countries have risen faster than increases in population (fig. 4). However, the population of each of the countries has risen substantially; in 1962 the total population of all EEC countries exceeded 175 million, but was only 157 million in 1950. The most populous country, West Germany, contained nearly 57 million individuals in 1962,

[4] The conversion rates in U.S. dollars per unit of domestic currency were as follows: France, .2025; West Germany, .2500; Italy, .0016; Netherlands, .2762; Belgium-Luxembourg, .0200. These are official as published in EEC Regulation No. 113, July 24, 1962.

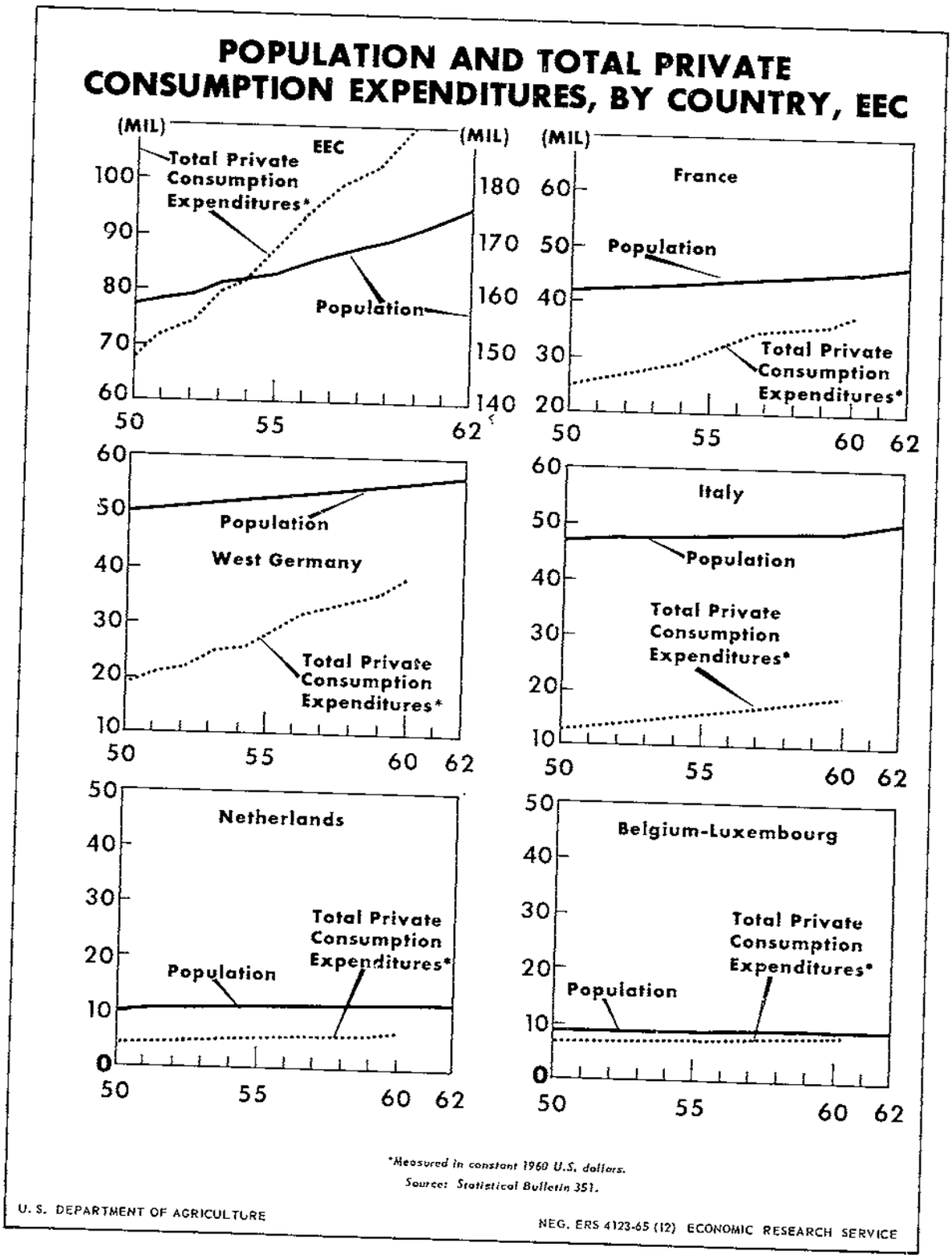
POPULATION AND TOTAL PRIVATE CONSUMPTION EXPENDITURES, BY COUNTRY, EEC
(MIL)
EEC
Total Private Consumption Expenditures*
Population
(MIL)
France
Population
Total Private Consumption Expenditures*
Population
West Germany
Total Private Consumption Expenditures*
Italy
Population
Total Private Consumption Expenditures*
Netherlands
Population
Total Private Consumption Expenditures*
Belgium-Luxembourg
Population
Total Private Consumption Expenditures*
*Measured in constant 1960 U.S. dollars.
Source: Statistical Bulletin 351.
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Figure 4

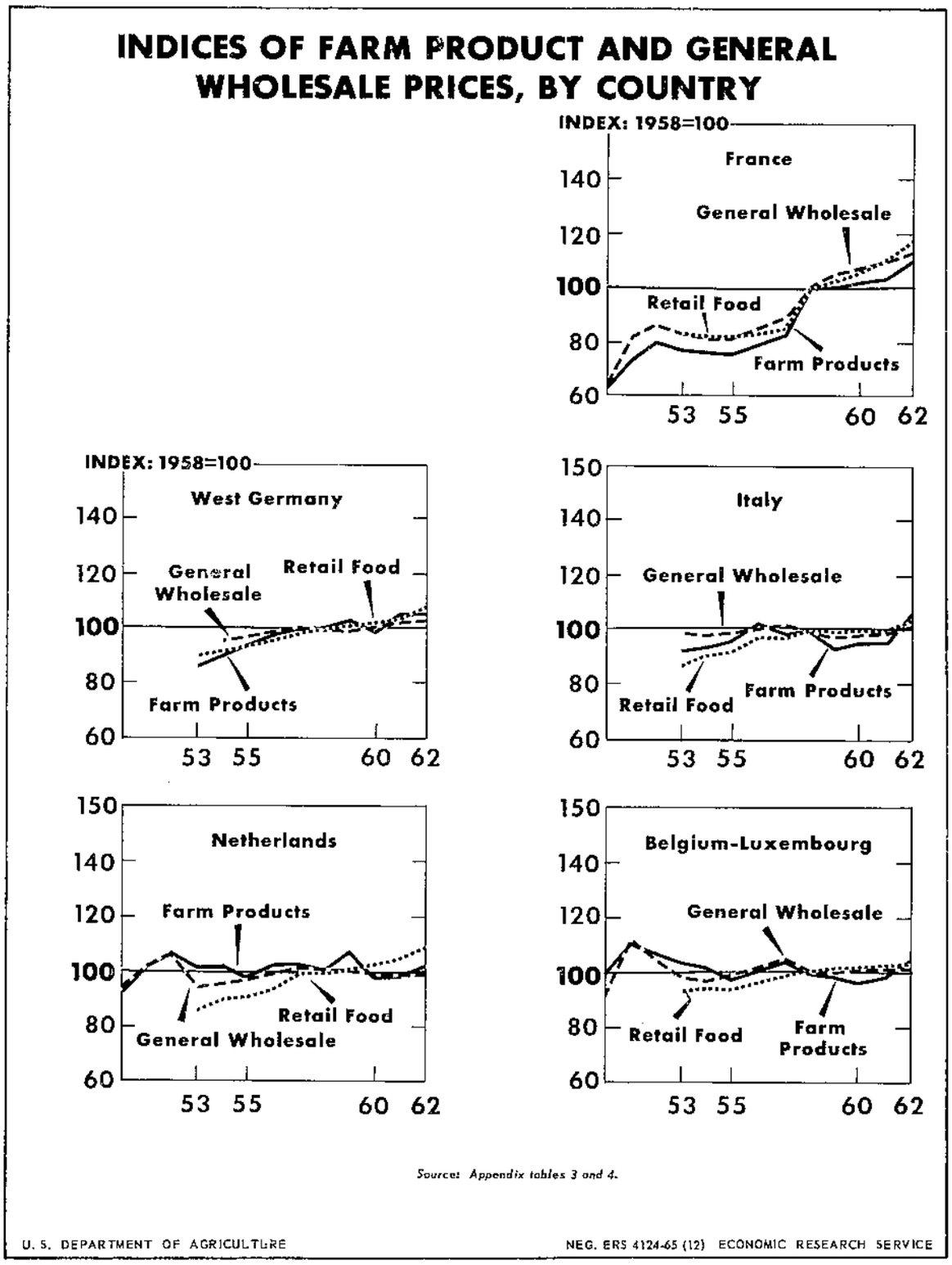
INDICES OF FARM PRODUCT AND GENERAL WHOLESALE PRICES, BY COUNTRY
INDEX: 1958=100
France
General Wholesale
Retail Food
Farm Products
West Germany
General Wholesale
Retail Food
Farm Products
Italy
General Wholesale
Retail Food
Farm Products
Netherlands
Farm Products
Retail Food
General Wholesale
Belgium-Luxembourg
General Wholesale
Retail Food
Farm Products
150
140
120
100
80
60
53
55
60
62
Source: Appendix tables 3 and 4.
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Figure 5

almost 14 percent more than in 1950. Italy was next, with more than 50 million and a comparable increase of 8 percent. France was third, with 47 million and an increase of 13 percent. The Netherlands, Belgium, and Luxembourg jointly contained over 21 million persons and had an aggregate increase of 12 percent during the 12-year period.

Because of the growth of population and consumer incomes, the demand for farm products remained strong. Therefore, trends in the general level of farm product prices held steady or even increased, depending upon the choice of policy of the individual partners (fig. 5). Italy and the three small countries were the principal ones where the trend in prices for farm products remained about constant throughout 1953-62. There were, of course, wide annual fluctuations in farm price levels within each of the four countries. These fluctuations would be principally due to annual variances in farm output. French farm price levels are in sharp contrast to the above. Although prices there were steadier in their year-to-year movements, they rose sharply and persistently from 1955 to 1965. West German farm prices showed yet another pattern. The general level rose rapidly prior to 1957 and then moderated to a slow gentle rise until 1962.

In the EEC as a whole, prices received by farmers followed general wholesale prices (fig. 5); however, farm prices fluctuated more from year-to-year, indicating that agriculture is subject to relatively greater variance in production conditions.

One indicator of relative farm prosperity is the ratio of prices received by farmers to the prices which they have to pay for production goods and services (fig. 6). In this respect, the farmers of Belgium and the Netherlands fared poorly during 1950-63. During this time, the price-cost ratio declined from 125 to 65 in the Netherlands, and from 99 to 77 in Belgium.

The price-cost ratio in West Germany also declined in this period, but not nearly as severely as in Belgium and the Netherlands. After an apparently moderate improvement, the German ratio began a general decline from 1950 to 1957 to reach a low of 96. This was a drop of 7 points from the earlier peak.

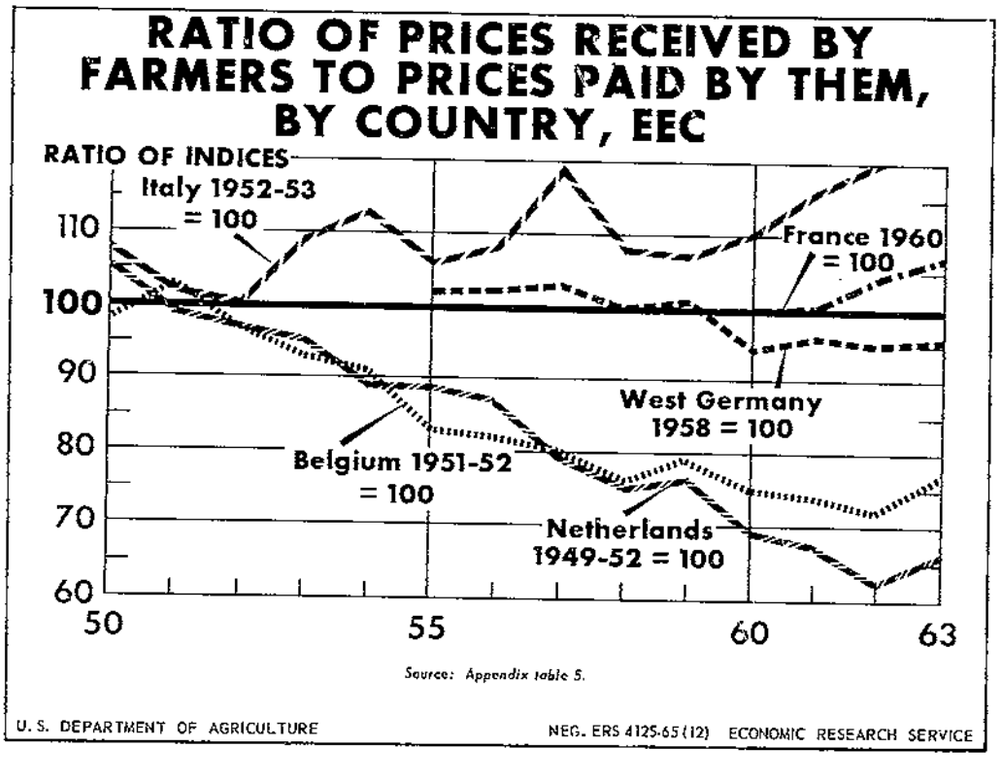

Figure 6

Though the price-cost ratio in Italy fluctuated in wide cycles, it trended in a decidedly upward movement. In 1950, the ratio was at 108 points. After a succession of three sharp cycles with a 15-point peak-to-trough interval, the index reached 120 points in 1963.

Price-cost data for France prior to 1960 are not available. However, since that time the ratio has risen progressively, mounting from 100 in 1960 to 107 in 1963.

Of course, the ratio of prices received to prices paid is only a rough measure of farm prosperity. It does not account for the effects of gains in production efficiency. Thus, even in countries with a declining price ratio, the economic well-being of farmers could actually have improved if large increases in production efficiency occurred. Unfortunately, no satisfactory measures of agricultural production efficiency exist for the EEC countries.

Farm Inputs and Technology

The mixture of land, labor, and capital used in agricultural production has undergone considerable transformation in the past decade or so. While the area of land used in farming remained virtually constant, the amount of labor used declined severely and has been replaced by increasing amounts of capital. These changes in resource use and the adoption of yield-increasing technology were the principal factors contributing to the general increase in farm output.

In 1958, the European Economic Community as a whole contained nearly 80 million hectares of land that were classed as being in agricultural uses (fig. 7). France, with nearly 40 million hectares of agricultural land, had by far the largest endowment of this resource. This land includes some of the most fertile soils in Europe.

Italy, with about 22 million hectares, ranked next in total farm area. However, much of Italy's agricultural land lies on drought-ridden rocky slopes, is comparatively low in native fertility, and is consequently unsuited for arable culture. The prime agricultural lands in this country are confined largely to the valley lands of the Po and of a few minor rivers.

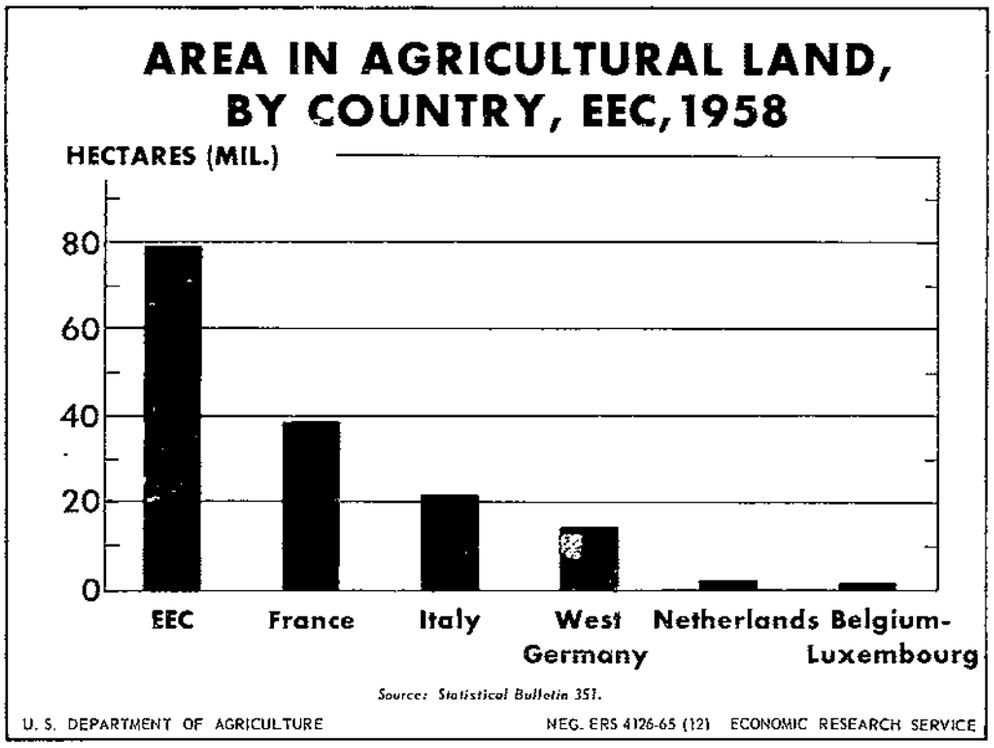

Figure 7

The agricultural land of West Germany, the Netherlands, Belgium, and Luxembourg together totaled about 18.5 million hectares, less than that of either France or Italy. The productive quality of the soil in these countries varies widely, reaching from the mountainous terrain of southern Germany to the productive grain and forage-growing regions of Belgium-Luxembourg.

The total amount of agricultural land in each of the countries did not change much during the 1950's. There was only a slight decline which in all probability consisted of acreage that was diverted to roads and urban structures. This pattern varied little from country to country.

The most significant of the overall changes in land utilization are the considerable increases that occurred in the area of forage production between 1950 and 1960 and the corresponding decline in the area of miscellaneous and idle land (fig. 8). Though complete data are not available, there is some evidence that this substitution has continued to the present.[5] The area in grain has remained virtually constant.

To a degree, the changes in land-use patterns were similar in each of the six countries. In France, however, the trends were somewhat more pronounced. Apparently, France has a considerable area of unused farmland, much of which was redirected to productive purposes in the past decade.[6] While this shift in land use resulted in some increase in the area of forage, it also contributed measurably to an increase in the area of grain.

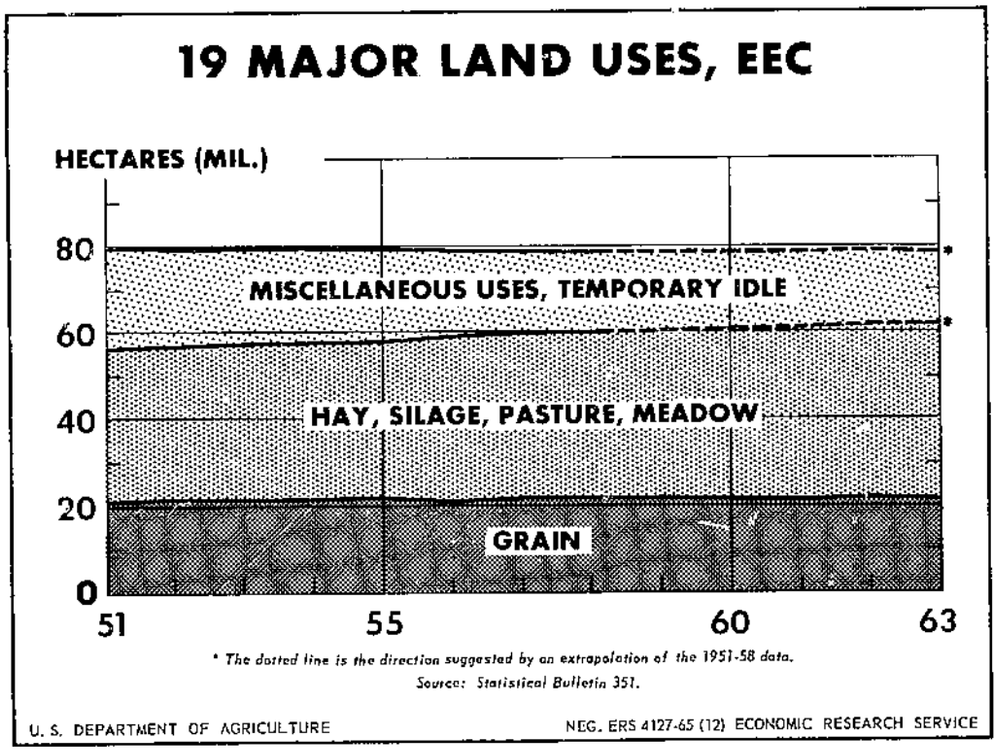

Figure 8

[5] For example, the area in pulses, root crops, and industrial crops continued to decline from 7.5 to 6.9 million hectares between 1958 and 1962, while at the same time the area in grains also declined slightly.

[6] This trend has actually prevailed since 1946. See Farnsworth, Helen C. Determinants of French Grain Production, Past, and Perspective. Stanford Food Res. Inst. Studies, Vol. IV, No. 3, 1964, p. 227.

The total amount of labor used in agriculture in the EEC seems to have declined persistently through the 1950's. This is indicated by the changes that have occurred in the permanent farm labor force. In 1950, the farm force consisted of more than 16.3 million permanent workers (fig. 9). But by 1960 this number had declined to less than 12.4 million, a decline of some 25 percent. During the same period, there also seemed to be a substantial decline in the number of temporary workers employed on farms. Unfortunately, the data on the temporary work force are incomplete.[7]

The sharpest decline in the number of permanent agricultural workers occurred in West Germany and Belgium-Luxembourg. The total decline in these countries was about 25 percent or an average of 2.5 percent per year for the 1950-60 period. This trend contrasts sharply with the smaller annual average declines of 1.5 to 2.1 percent in some other parts of the EEC.

As in the United States, the farms of Europe are largely family farms operated with the aid of hired labor. In the study period, the ratio of permanent hired workers to permanent family workers did not change importantly (except in West Germany), although the ratios were different from country to country. In France and the Netherlands, family workers continued to comprise about 80 percent of the permanent labor force; in Italy, the ratio held steady at about 72 percent; and in Belgium-Luxembourg, it remained at about 93 percent. West Germany was the only country in the EEC in which the number of permanent hired workers declined faster than the number of family workers. Here family workers comprised 79 percent of the permanent farm labor force in 1950 and 86 percent in 1960. Possibly, this reflects the sharp labor demands from industry that have apparently drawn considerable labor from West German farms. It seems that some of these workers have been replaced by immigrant labor chiefly from Italy.

The loss of labor was to a large degree compensated by mechanization. This, combined with the adoption of techniques involving new plant and animal varieties and increased use of fertilizers, insecticides, weedicides, herbicides, fungicides, and so forth, made possible the sharp increases in total output.

The change in the number of tractors on farms serves as a partial index of the rate at which new mechanized methods were adopted in recent years. In 1951, farms in the EEC were not highly mechanized; there were only 413,000 farm tractors. In the years that followed, mechanization occurred so rapidly that in 1962 there were nearly 2.3 million tractors on farms--some $5\frac{1}{2}$ times as many as 12 years earlier (fig. 10). It seems quite likely that comparable mechanizing advances were made via the adoption of types and designs of ancillary machinery and farm equipment. However, available data are too sparse to substantiate this supposition.[8]

The most rapid advances in mechanization seemed to occur in Germany. The sharpest reductions in permanent labor also took place there. The number of tractors in use in West Germany increased more than 6 times in the past dozen years. This contrasts with increases of just over 4 times in the three small countries, and of 5 and $5\frac{1}{2}$ times, respectively, in Italy and France.

There is some evidence that mechanization also spread to the production of livestock and livestock products. For example, the number of milking machines in France and Belgium-Luxembourg almost doubled from 1955 to 1962. In West Germany, the number increased 4 times during the same period, while in the Netherlands the number increased more than

---

[7] The available data show that the number of temporary farm workers in millions declined from 2.9 to 2.2 in West Germany, 2.2 to 1.3 in Italy, and .06 to .05 in the Netherlands in the 1950's. See Agrarstatistik, Satistisches Amt der Europäischen Gemein-schaften No. 1, 1964, Brussels.

[8] For example, in France there were about 4 times as many combine harvesters in use in 1962 as in 1955; in West Germany there were 10 times as many.

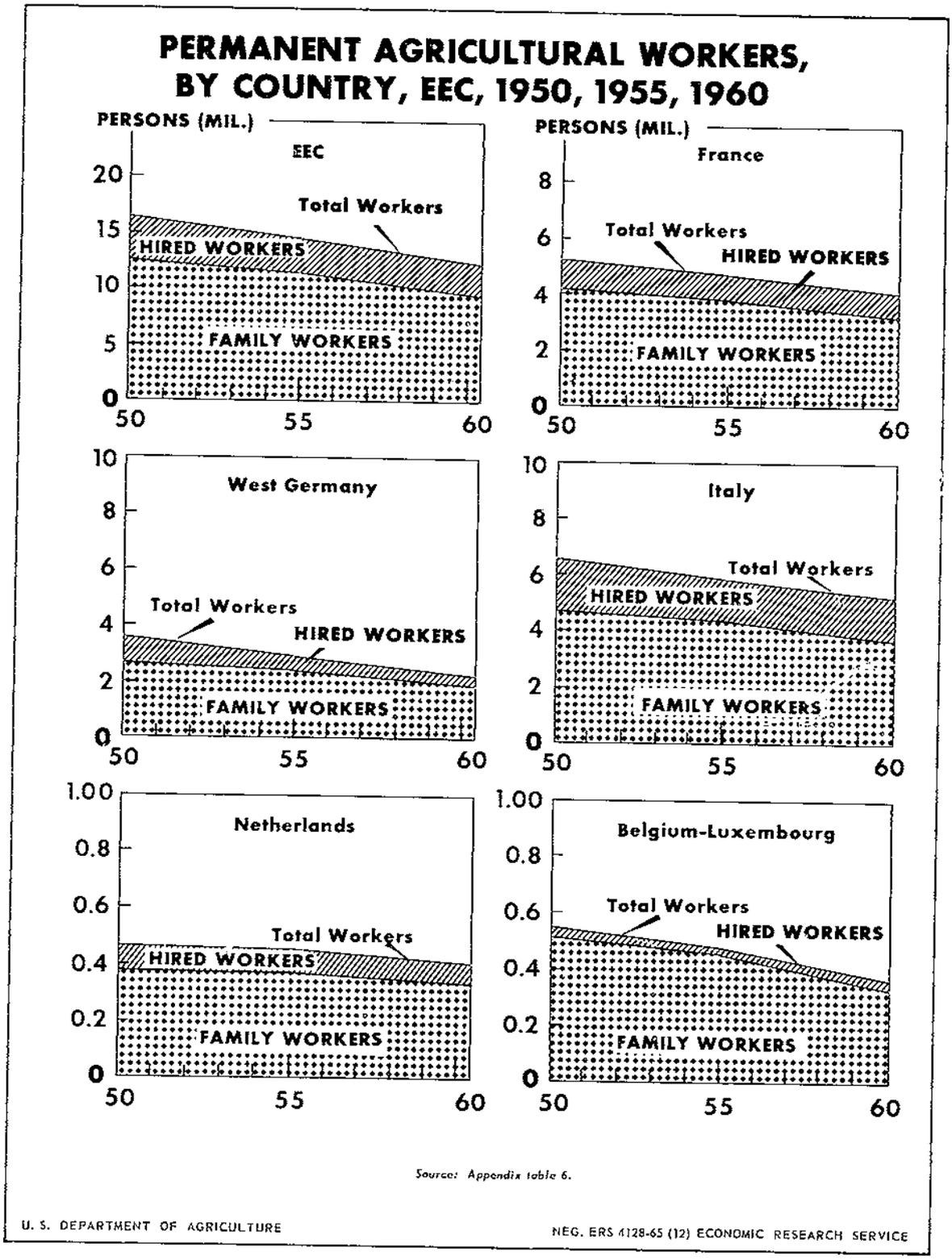
PERMANENT AGRICULTURAL WORKERS, BY COUNTRY, EEC, 1950, 1955, 1960
PERSONS (MIL.)
EEC
Total Workers
HIRED WORKERS
FAMILY WORKERS
20
15
10
5
0
50
55
60
PERSONS (MIL.)
France
Total Workers
HIRED WORKERS
FAMILY WORKERS
8
6
4
2
0
50
55
60
West Germany
Total Workers
HIRED WORKERS
FAMILY WORKERS
10
8
6
4
2
0
50
55
60
Italy
Total Workers
HIRED WORKERS
FAMILY WORKERS
10
8
6
4
2
0
50
55
60
Netherlands
Total Workers
HIRED WORKERS
FAMILY WORKERS
1.00
0.8
0.6
0.4
0.2
0
50
55
60
Belgium-Luxembourg
Total Workers
HIRED WORKERS
FAMILY WORKERS
1.00
0.8
0.6
0.4
0.2
0
50
55
60
Source: Appendix table 6.
U. S. DEPARTMENT OF AGRICULTURE
NEG. ERS 4128-65 (12) ECONOMIC RESEARCH SERVICE

Figure 9

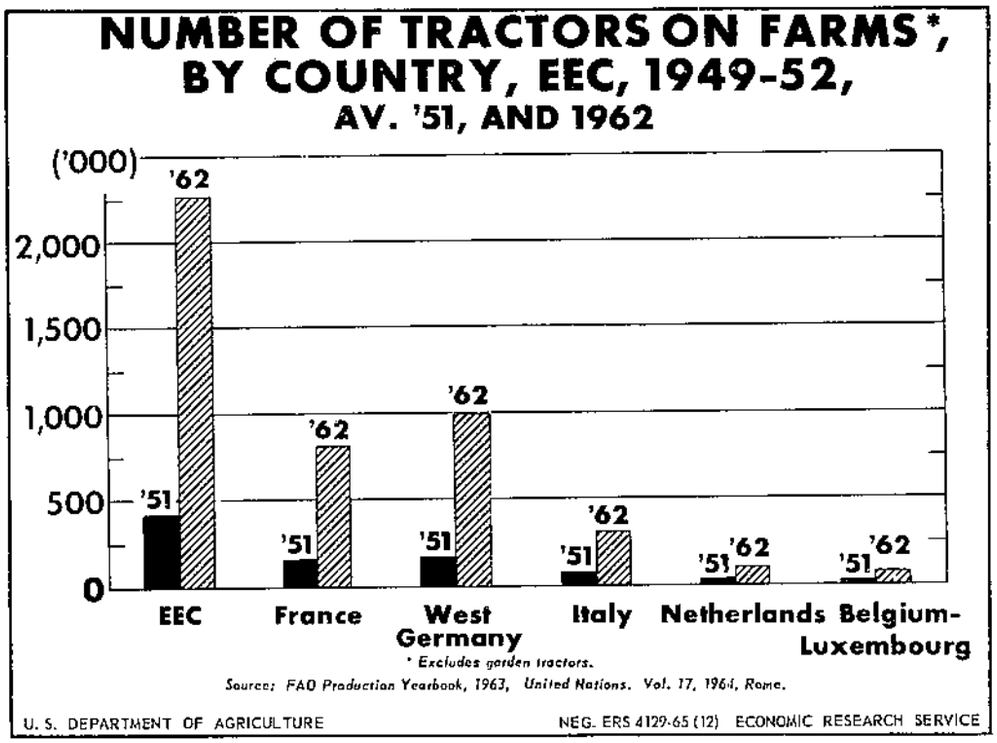

Figure 10

6 times. Thus, excluding Italy, for which comparable data were not available, there were more than 622,000 milking machines in the five remaining EEC countries in 1962--about 1 for every 32 milk cows. This compares with a ratio of 1 machine for every 85 milk cows in 1955.[9]

The rate of adoption of yield-increasing technology is perhaps best, though incompletely, indicated by changes in the tonnage of commercial fertilizers used. From 1951 to 1962, the total tonnage of the three main plant foods, nitrogen (N), phosphorus (P_2O_5), and potash (K_2O) almost doubled, reaching more than 7 million tons in 1962 (fig. 11). This average situation approximates the trend in West Germany and Italy, but in France the increase in the 12-year period was about $2\frac{1}{2}$ times the 1951 level. The three small countries, which have traditionally been heavy users of commercial fertilizer, showed the lowest relative rate of increase.

On the average, the six countries used about one-quarter of a ton of commercial fertilizer per hectare of land in grains, pulses, roots, and industrial crops in 1962.[10] The Netherlands, which applied two-thirds of a ton per hectare, was the heaviest user among the six. Italy used only one-tenth of a ton. The remaining countries had the following ratios of use in 1962: Belgium-Luxembourg, about one-half ton per hectare; West Germany, about three-eighths; and France, about one-fifth.

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[9] Data on milking machines were obtained from FAO, Production Yearbook, 1963, Vol. 17, 1964, table 106. Data on milk cows were obtained from Statis. Bul. 351, tables 6.01 and 6.04. Note that milk cows include cows temporarily dry.

[10] This basis for comparison is probably not the best since it overstates the case in some countries; for example, in the Netherlands commercial fertilizer is also applied heavily to forage crops.

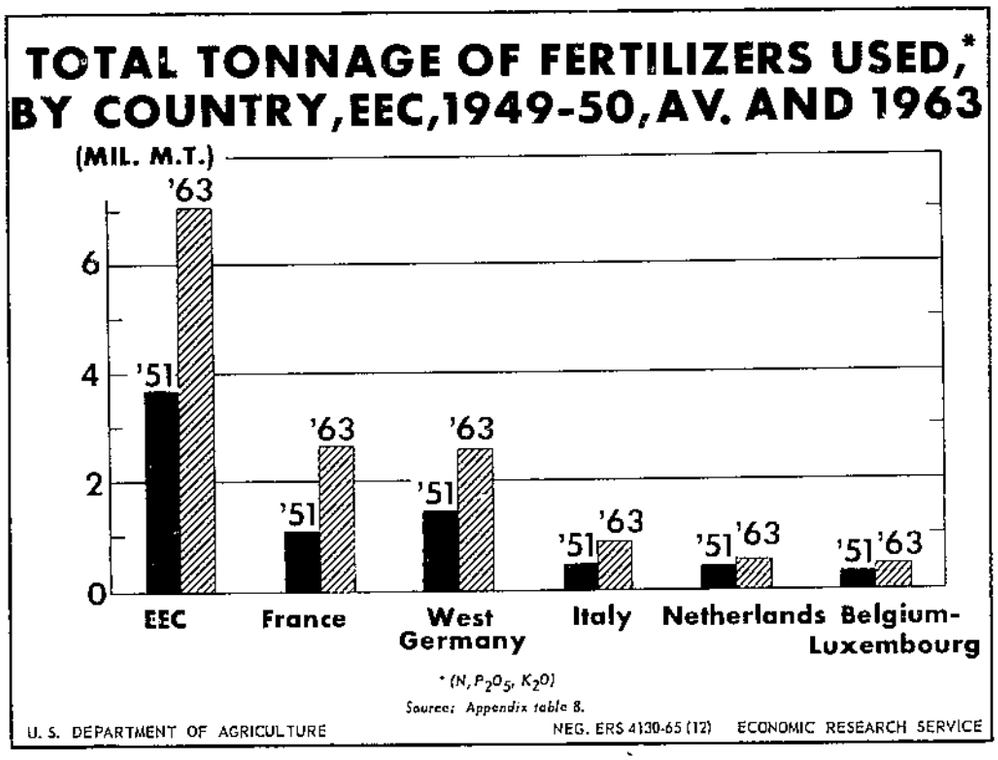

Figure 11

Agricultural Policy in the 1950's

The Treaty of Rome has probably had only minor, if any, influence on the physical and economic relations in the agriculture of the European Economic Community. The changes that have occurred in technology and in the trends in farm inputs and outputs would likely have occurred even if the treaty had not been signed in 1957.

In spite of the many important achievements in the agriculture of the EEC since 1950, much remains to be done. The problem of small farms and underemployment in agriculture seems to persist; it is particularly acute in parts of Belgium, West Germany, and Italy. [11] As in the United States, the incomes from agriculture appear to remain substantially below those of nonfarm workers. The exception is the Netherlands.

The interests of agriculture have been well represented politically. Even though only 20 percent of the population in the EEC is engaged in agriculture, the rural areas tend to be represented in greater proportion in their respective parliaments than the urban ones. In addition, agricultural organizations and pressure groups seem to be plentiful and to arise often so that the needs and demands of farmers receive a close and frequently responsive hearing.

The agricultural policies of the member countries continue to advocate the improvement of farm family incomes and living conditions in rural areas. However, a more fundamental objective, and one that is only partly consistent with the income goal, is the implicit goal of a high degree of national self-sufficiency.

The basic economic adjustments necessary to resolve the problems of farm income and increased agricultural output are difficult, and at best slow, to attain. Thus, governments

[11] For example, in the mid-1950's some 56 percent of the farms in West Germany and Italy had less than 5 hectares of land; in Belgium, the comparable figure was 90 percent.

have historically engaged in costly programs of price and income supports for farm products and direct subsidies and tax relief to encourage farm production.

Since the signing of the Treaty of Rome in 1957, the agricultural policies of the respective member countries have, for practical purposes, remained independent in spite of the attempts to achieve a common structure. In other words, there was virtually no important economic or political integration during the late 1950's other than that obtained through normal trade. Only in very recent years has there been an active push toward integration of farm policies.

While the agricultural policies of the member countries have all been aimed at protecting the incomes of farmers against the full impact of competition, they have not been equally protective as revealed by their attitude toward farm prices. When compared at their market rate of currency exchange, farm prices are found to differ widely from country to country. In general, farm prices are highest in West Germany and lowest in France.

A study of the respective prices of barley, the principal feed grain, gives some indication of the differences in general farm price levels and the direction of price movement (fig. 12). In the early 1950's, the price of barley in West Germany was nearly twice as high as in France. However, because of different policy views the two prices have converged, so that in the early 1960's the West German price was only $1\frac{1}{2}$ times as high. As the 1960's progress, the price convergence is becoming even more pronounced: French prices continue to move upward, while West German prices remain practically unchanged. Thus, feed grain prices among the countries of the EEC, under basically autonomous country policies, have moved closer and closer together during the past decade. This would indicate that the respective policies may have been consistent with the principle of price harmonization.

Some important progress has been made in revising the mechanics by which to achieve the goal of a fully integrated agriculture. Even though they are currently ineffective, these

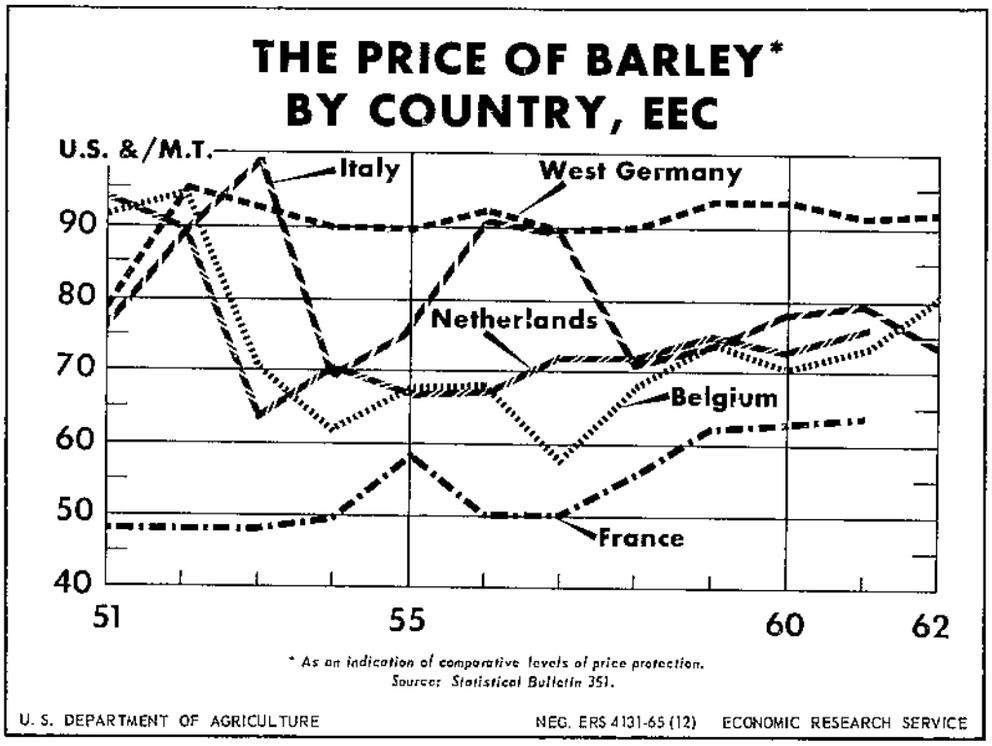

Figure 12

revisions are the necessary groundwork for ultimate integration. The actions taken to date vary by commodity. For products such as wheat, feed grains, rice, sugar, and dairy products, price levels are to be maintained by a structure of levies to all non-Community suppliers. Where such commodities are in surplus, the price floor is to be maintained by appropriate government intervention. The mechanics differ markedly from the variety of quotas and levies that have been employed by individual members in the past.

Beef, poultry, eggs, and pork are also to be supported by a system of levies. However, this action is not likely to be supplemented by direct government purchases.

In July 1962, the EEC effected a set of marketing and trading regulations aimed at achieving common prices for the various commodities. This is not an easy task in view of the widely divergent prices. Recently, agreement was reached on the basic structure and schedule of implementation of a common grain price policy. Also, a common livestock price policy is expected to be agreed upon in the near future.

A common agricultural policy could lead to a more efficient utilization of farm resources. This depends upon whether greater dependence is placed upon international trade, or whether autarkic goals of the individual members are subsumed into the total objectives for the EEC.

PRODUCTION AND CONSUMPTION OF MEATS

Meat has long been an important component of both total food production and total food consumption in the countries of the European Economic Community. Changes in the levels of meat production and consumption in the EEC are important to the United States for two reasons: They determine the size of the import market for meat in the Community; and they influence in large measure the Community's consumption, production, and import requirements for feed grains. A historical examination of changes in the production and consumption of meats provides some important insights into the changing nature of the Community's grain-livestock economy. However, deep analytical probing will be required for making projections and forecasts.

Changes in total production and consumption of livestock in the EEC are of interest in light of the pending completion of the union. But it is also important to examine the relative changes among countries to determine shifts in the relative importance of EEC countries as suppliers or consumers of meats.

The very modest gap between production and consumption of meats is probably a result of the high-price policies which the countries of the EEC have maintained through the late 1950's. These policies no doubt have tended to discourage consumption and at the same time encourage production. The potential effect on meat imports of the continuation of such policies is an important area for future inquiry.

The gap between production and consumption of all meats in the EEC follows some well-defined patterns (figs. 13-17).[12] Net imports of meat by the Community remained about constant between 1956 and 1961. Increases in production kept pace with the increases in consumption, so that the EEC was 96 percent self-sufficient in total meats, and imports remained a small portion of total domestic consumption. The meat imports by West Germany and Italy increased during this period. On the other hand, exports from the Netherlands increased. France switched from a relatively small net importer of meats to a small net exporter, while Belgium-Luxembourg maintained its small net import position.

Production and consumption of beef and veal alone reveal a different pattern. In general, production increased at a faster rate than consumption, so the aggregate level of imports fell. Imports increased only in Italy. The EEC as a whole retained virtual self-sufficiency in pork; Germany was the only importer of consequence and the Netherlands was the only important exporter. Consumption of poultry meat has increased phenomenally and has thereby caused net imports to the EEC to grow. However, this picture is weighted heavily by the

[12] Total meat production data used here include edible offals, whereas total meat production data used earlier in the chapter did not.

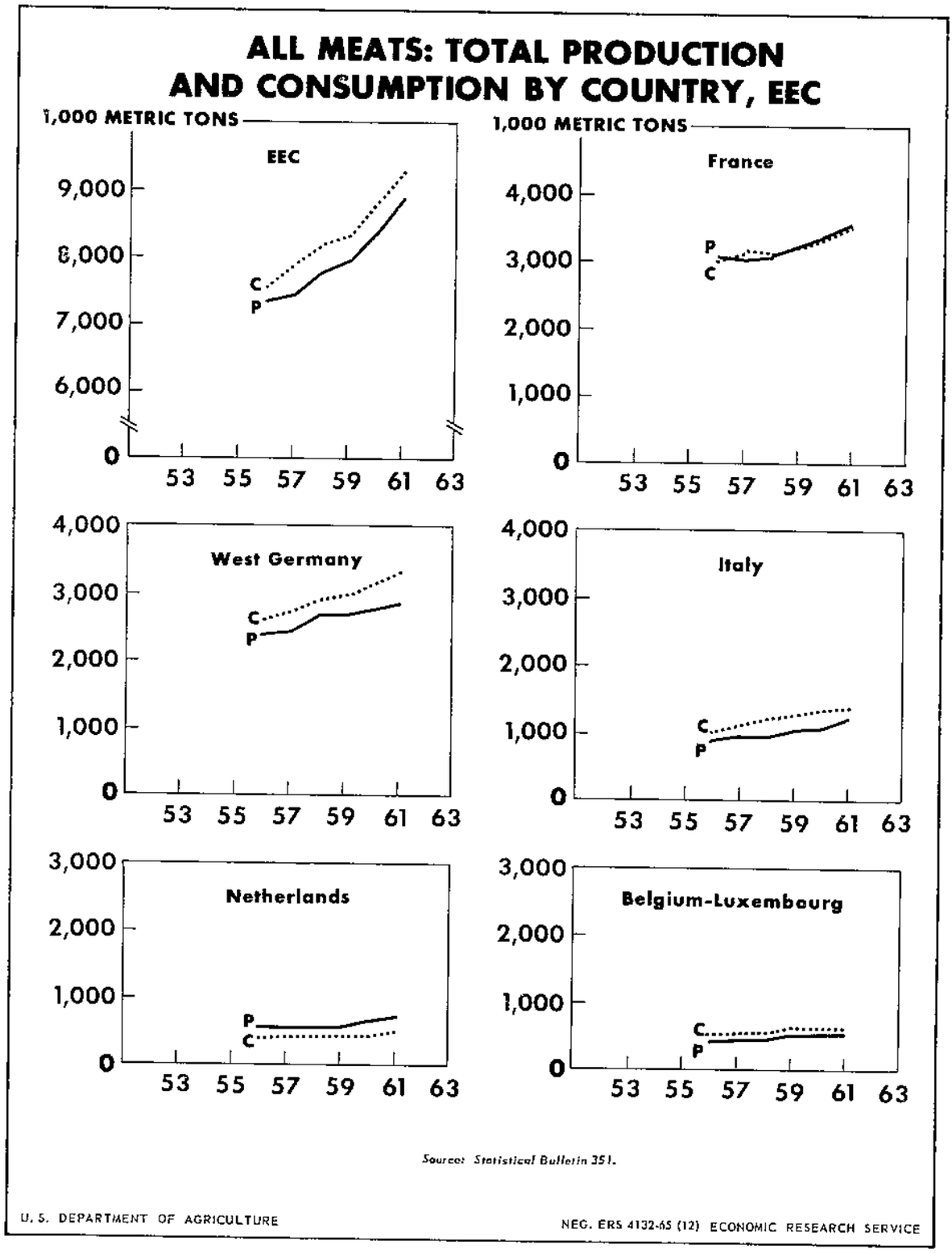
ALL MEATS: TOTAL PRODUCTION AND CONSUMPTION BY COUNTRY, EEC
1,000 METRIC TONS
EEC
9,000
8,000
7,000
6,000
0
C
P
53 55 57 59 61 63
1,000 METRIC TONS
France
4,000
3,000
2,000
1,000
0
P
C
53 55 57 59 61 63
West Germany
4,000
3,000
2,000
1,000
0
C
P
53 55 57 59 61 63
Italy
4,000
3,000
2,000
1,000
0
C
P
53 55 57 59 61 63
Netherlands
3,000
2,000
1,000
0
P
C
53 55 57 59 61 63
Belgium-Luxembourg
3,000
2,000
1,000
0
C
P
53 55 57 59 61 63
Source: Statistical Bulletin 351.
U. S. DEPARTMENT OF AGRICULTURE
NEG. ERS 4132-65 (12) ECONOMIC RESEARCH SERVICE

Figure 13

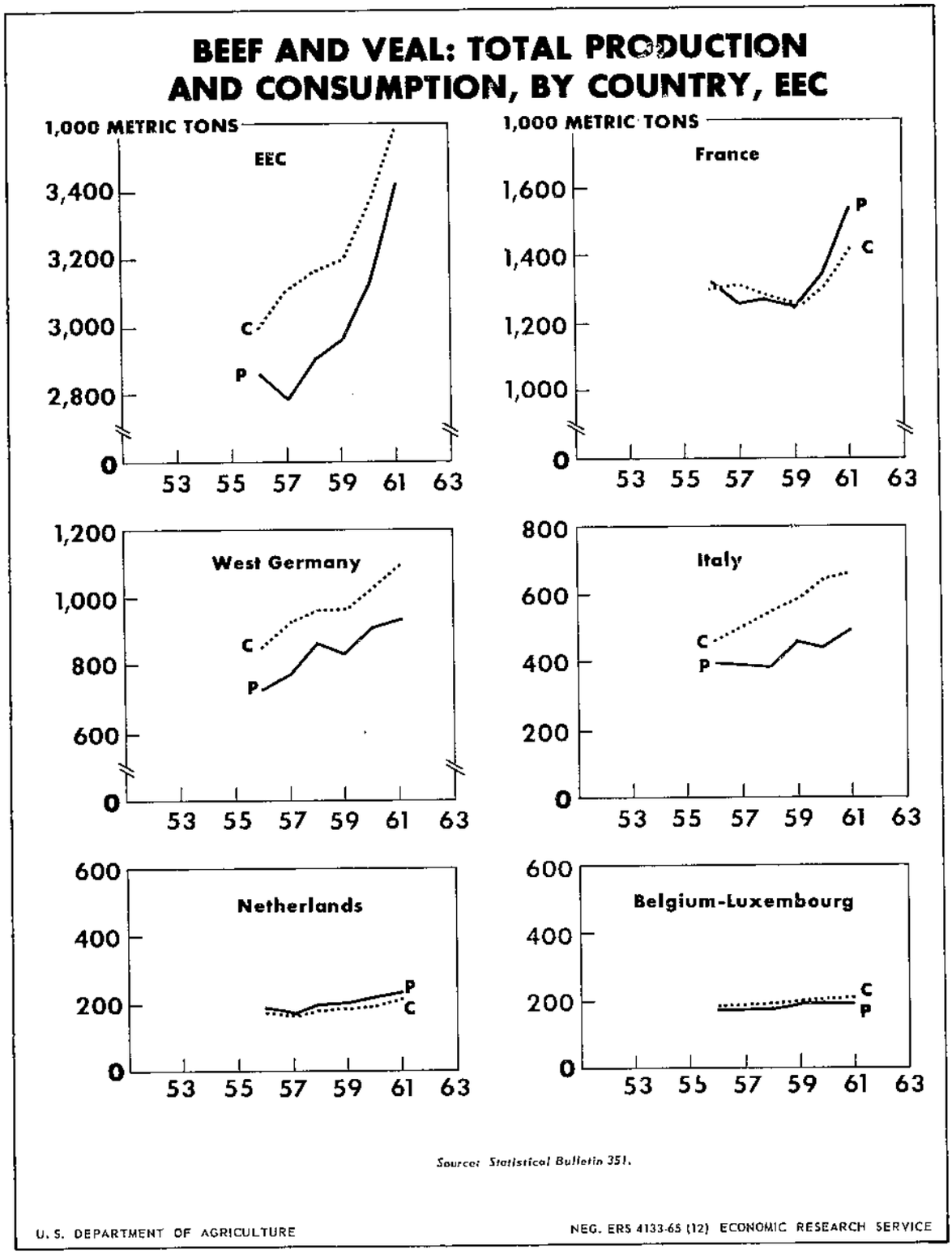
BEEF AND VEAL: TOTAL PRODUCTION AND CONSUMPTION, BY COUNTRY, EEC
1,000 METRIC TONS
EEC
3,400
3,200
3,000
2,800
0
C
P
53 55 57 59 61 63
1,000 METRIC TONS
France
1,600
1,400
1,200
1,000
0
P
C
53 55 57 59 61 63
1,200
West Germany
1,000
800
600
0
C
P
53 55 57 59 61 63
800
Italy
600
400
200
0
C
P
53 55 57 59 61 63
600
Netherlands
400
200
0
P
C
53 55 57 59 61 63
600
Belgium-Luxembourg
400
200
0
C
P
53 55 57 59 61 63
Source: Statistical Bulletin 351.
U. S. DEPARTMENT OF AGRICULTURE
NEG. ERS 4133-65 (12) ECONOMIC RESEARCH SERVICE

Figure 14

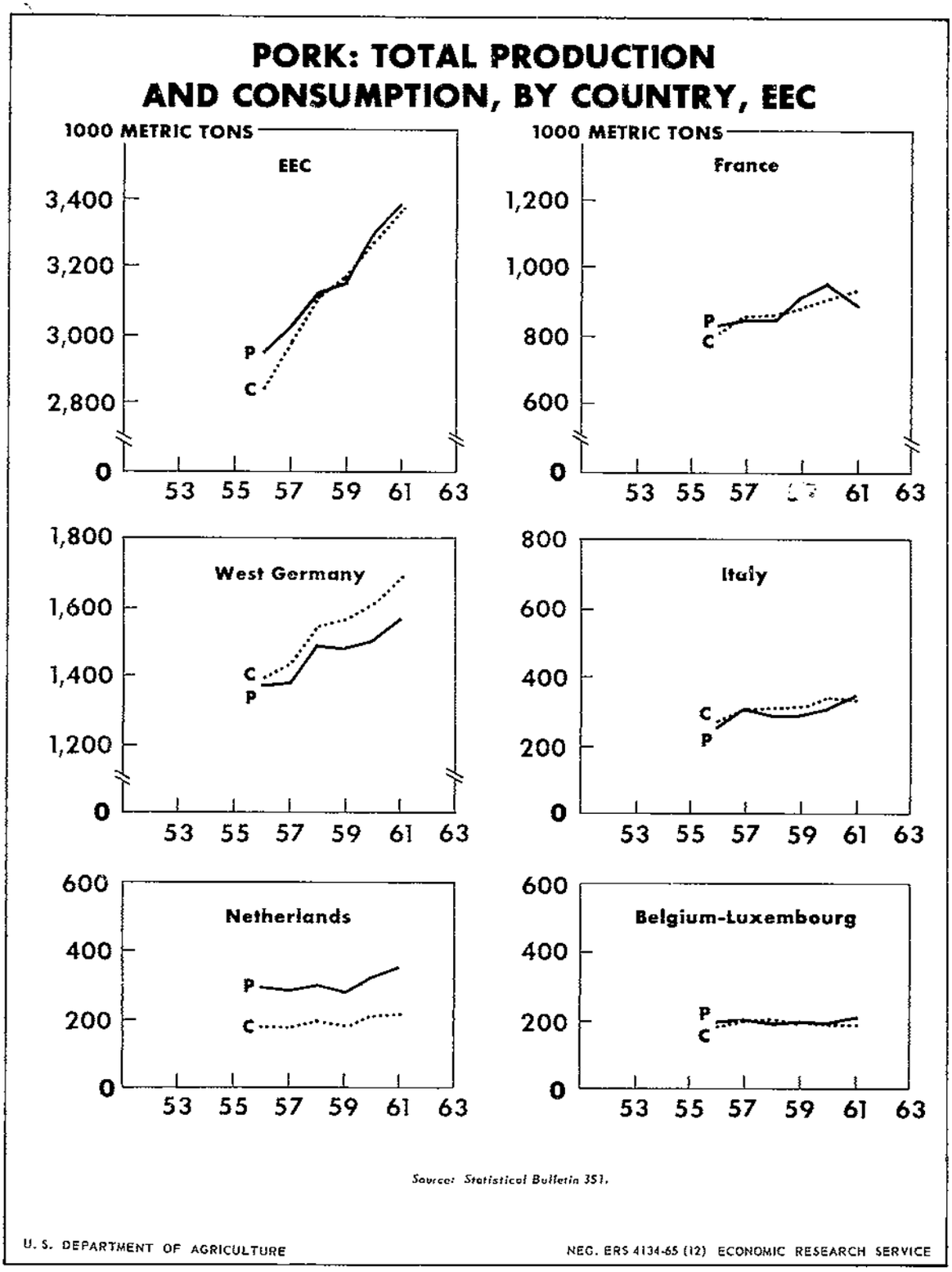
PORK: TOTAL PRODUCTION
AND CONSUMPTION, BY COUNTRY, EEC
1000 METRIC TONS
EEC
3,400
3,200
3,000
2,800
0
P
C
53 55 57 59 61 63
1000 METRIC TONS
France
1,200
1,000
800
600
0
P
C
53 55 57 61 63
1,800
1,600
1,400
1,200
0
West Germany
C
P
53 55 57 59 61 63
800
600
400
200
0
Italy
C
P
53 55 57 59 61 63
600
400
200
0
Netherlands
P
C
53 55 57 59 61 63
600
400
200
0
Belgium-Luxembourg
P
C
53 55 57 59 61 63
Source: Statistical Bulletin 351.
U. S. DEPARTMENT OF AGRICULTURE
NEG. ERS 4134-65 (12) ECONOMIC RESEARCH SERVICE

Figure 15

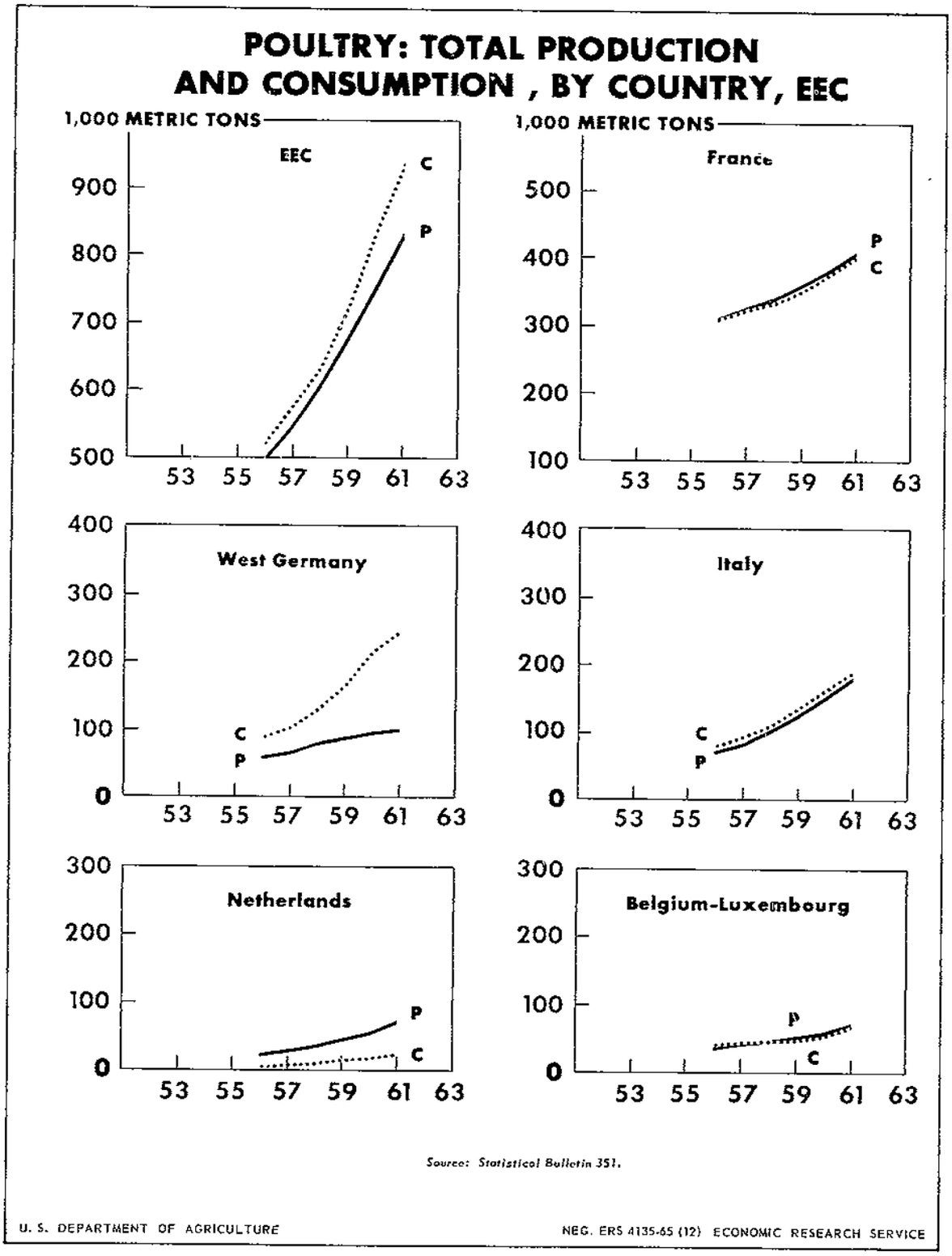
POULTRY: TOTAL PRODUCTION AND CONSUMPTION , BY COUNTRY, EEC
1,000 METRIC TONS
EEC
C
P
900
800
700
600
500
53 55 57 59 61 63
1,000 METRIC TONS
France
P
C
500
400
300
200
100
53 55 57 59 61 63
West Germany
C
P
400
300
200
100
0
53 55 57 59 61 63
Italy
C
P
400
300
200
100
0
53 55 57 59 61 63
Netherlands
P
C
300
200
100
0
53 55 57 59 61 63
Belgium-Luxembourg
P
C
300
200
100
0
53 55 57 59 61 63
Source: Statistical Bulletin 351.
U. S. DEPARTMENT OF AGRICULTURE
NEG. ERS 4135-65 (12) ECONOMIC RESEARCH SERVICE

Figure 16

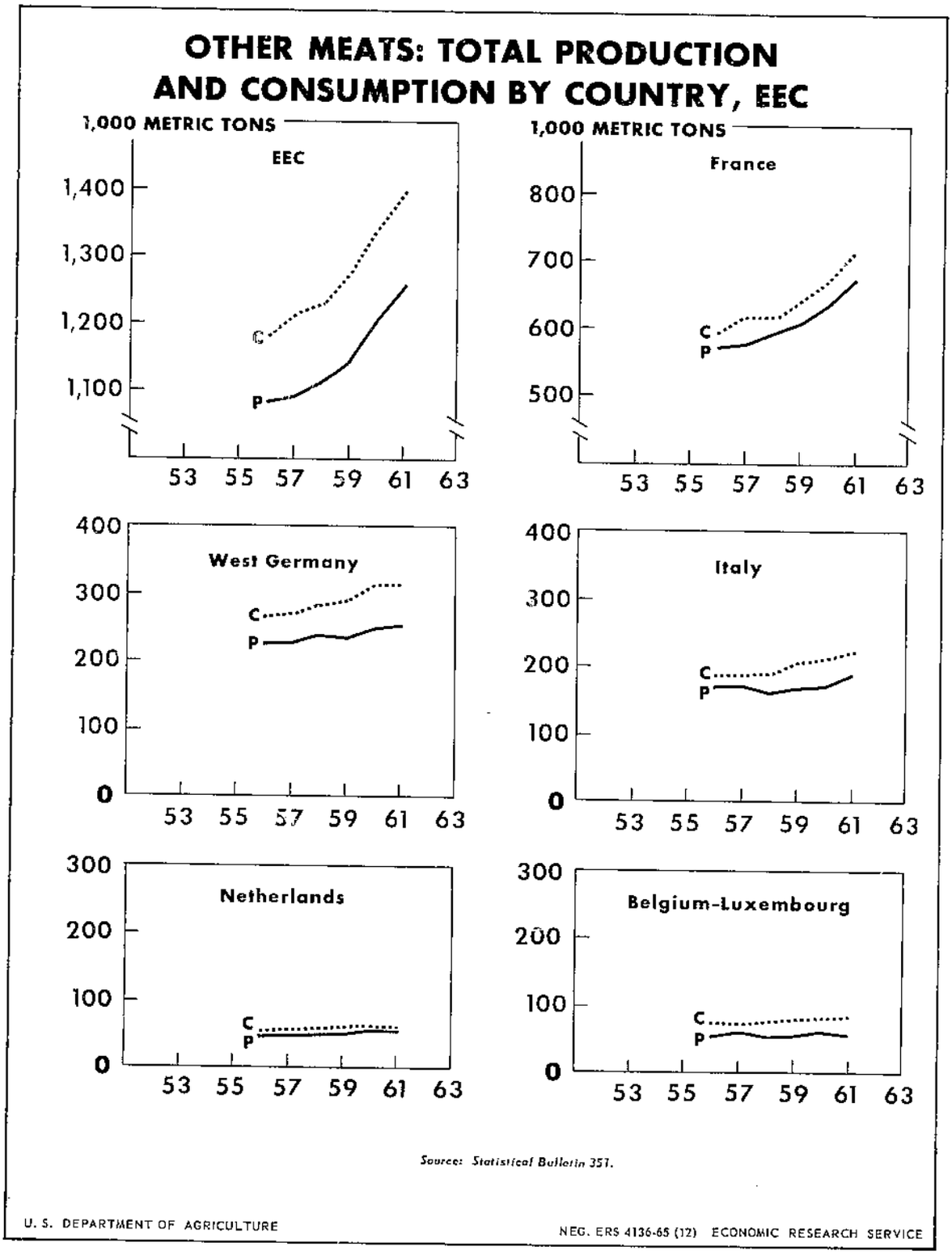
OTHER MEATS: TOTAL PRODUCTION AND CONSUMPTION BY COUNTRY, EEC
1,000 METRIC TONS
EEC
1,400
1,300
1,200
1,100
C
P
53 55 57 59 61 63
1,000 METRIC TONS
France
800
700
600
500
C
P
53 55 57 59 61 63
West Germany
400
300
200
100
0
C
P
53 55 57 59 61 63
Italy
400
300
200
100
0
C
P
53 55 57 59 61 63
Netherlands
300
200
100
0
C
P
53 55 57 59 61 63
Belgium-Luxembourg
300
200
100
0
C
P
53 55 57 59 61 63
Source: Statistical Bulletin 357.
U. S. DEPARTMENT OF AGRICULTURE
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Figure 17

situation in West Germany where during 1956-61 increases in consumption greatly exceeded increases in production. The Netherlands was the only growing exporter of poultry meat, while the other countries remained about self-sufficient.

Production of miscellaneous meats lagged considerably behind the increases in consumption. Imports grew in all countries except in the Netherlands where near self-sufficiency was retained.

Production of Meats

Total meat production in the European Economic Community, which currently amounts to more than 9 million metric tons, increased markedly in the decade of the 1950's and the early 1960's. The increase from 1952-54 to 1960-62 was nearly 40 percent for the EEC as a whole. On a country basis, this increase consisted of about 35 percent for France; nearly 40 percent for West Germany; around 50 percent for Italy and the Netherlands; and just over 30 percent for Belgium-Luxembourg (fig. 18).

The kinds of meat produced also changed. While there were only small increases in veal, mutton, goat, and horse meat, there were considerably sharper increases in beef, pork, and poultry. The increases in beef were uniformly high in all countries but the Netherlands. The relative increases in poultry production were large in all countries, especially in Italy, the Netherlands, and Belgium. Of course, all of the countries had rather low levels of production at the beginning of the period, so the relative increases appear larger than warranted by the absolute gains.

While a rather simple and straightforward picture of aggregate meat production emerged, changes in detail were very complex and subject to considerable variation in trend and magnitude. For a more complete picture, it is therefore necessary to consider the changes from country to country in the production base and changes in slaughter and carcass weights of each class of livestock.

The Basic Herd

The potential output of livestock and livestock products is closely associated with the amount of breeding stock available and the biological constraints this may pose for production. Of particular importance are the questions that relate to the long-run potentials of beef production. This may depend upon the extent to which the dual-purpose types of cattle available in the EEC can be used as a basis for beef production, the extent to which the complementary production of milk can be utilized economically, and the extent to which specialized beef enterprises may encroach upon the farm scene. It is also of interest to consider the economic possibilities for increasing hog and poultry production and the degree to which this may fill the demand gap between beef production and total requirements for meat. This has extended meaning for future land-use adjustments that may be required between grain and forage uses as the ratio between forage- and grain-consuming animals changes in the long- and short-run.

By the end of 1952-62, France had by far the largest livestock production base of any of the member countries--more than two-fifths of the Community's cattle, one-third of the poultry, and more than one-quarter of the hogs. West Germany ranked second in the total number of most classes of livestock but ranked first in hog numbers. West Germany contained nearly 50 percent of the Community's hogs and had nearly twice as many as France. Italy was the third-ranking member in livestock numbers. However, the number of poultry on hand there exceeded substantially the number in West Germany.

During 1952-62, there was a steady increase in the numbers of cattle, hogs, and poultry on hand and a steady decline in the numbers of sheep, goats, horses, mules, and donkeys (fig. 19). The annual average inventory shows an increase of 12 percent in the number of milk cows; 20 percent in the number of "other" cattle;[13] 25 percent in hogs; and 24 percent in poultry

[13] Includes steers, bulls, and animals under 2 years of age of both dairy and beef breeds.

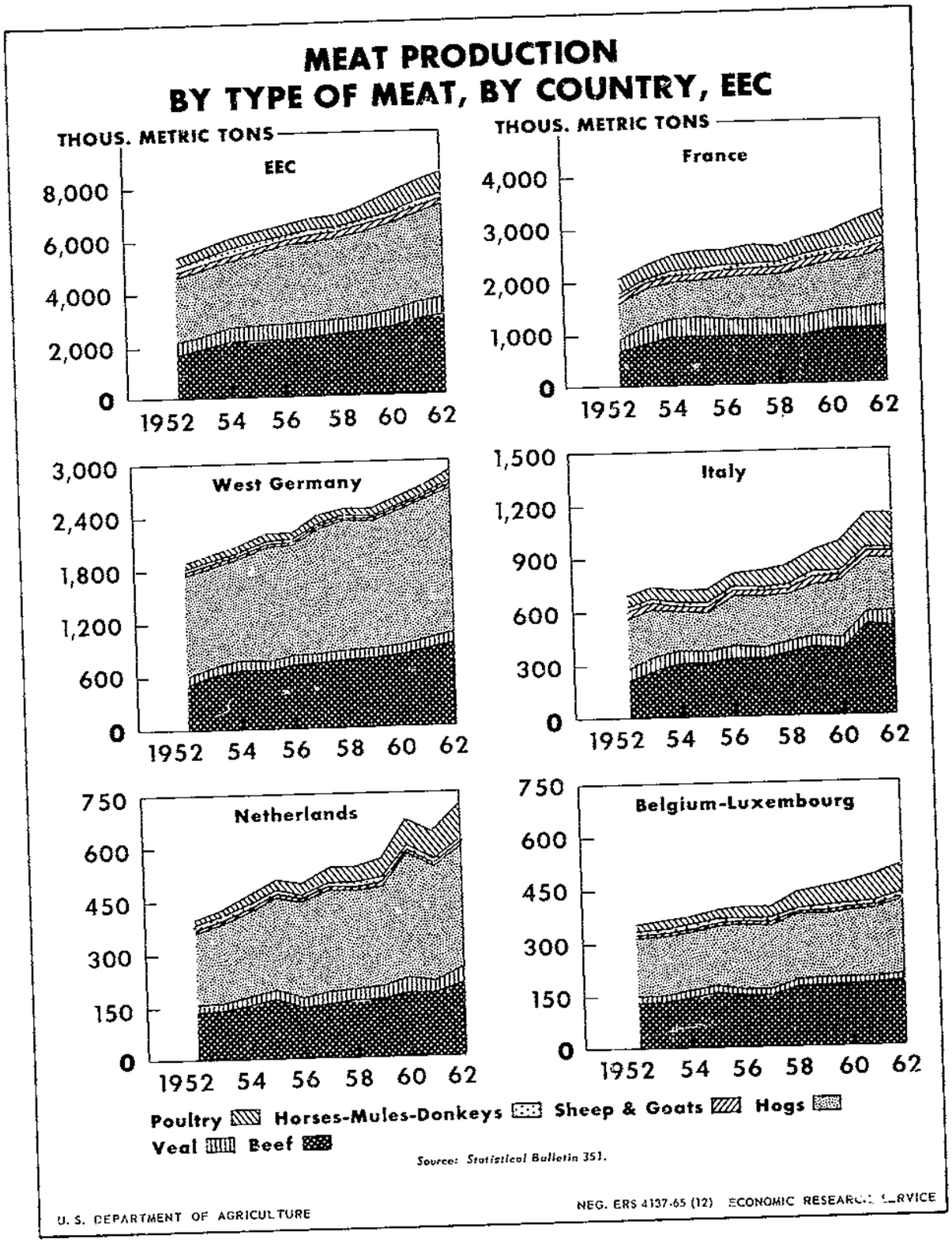
MEAT PRODUCTION
BY TYPE OF MEAT, BY COUNTRY, EEC
THOUS. METRIC TONS
EEC
8,000
6,000
4,000
2,000
0
1952 54 56 58 60 62
THOUS. METRIC TONS
France
4,000
3,000
2,000
1,000
0
1952 54 56 58 60 62
West Germany
3,000
2,400
1,800
1,200
600
0
1952 54 56 58 60 62
Italy
1,500
1,200
900
600
300
0
1952 54 56 58 60 62
Netherlands
750
600
450
300
150
0
1952 54 56 58 60 62
Belgium-Luxembourg
750
600
450
300
150
0
1952 54 56 58 60 62
Poultry
Horses-Mules-Donkeys
Sheep & Goats
Hogs
Veal
Beef
Source: Statistical Bulletin 351.
U. S. DEPARTMENT OF AGRICULTURE
NEG. ERS 4137-65 (12) ECONOMIC RESEARCH SERVICE

Figure 18

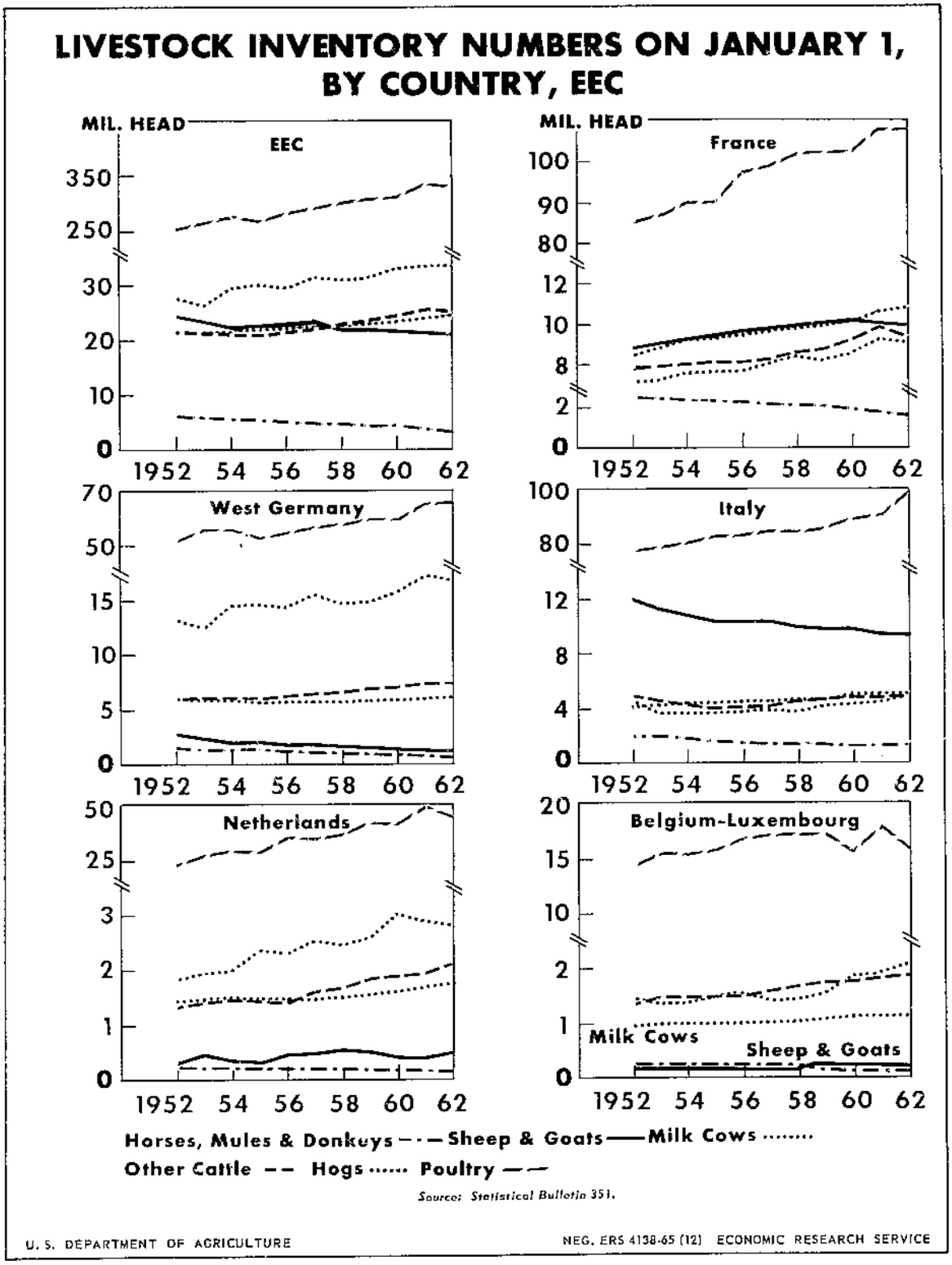
LIVESTOCK INVENTORY NUMBERS ON JANUARY 1, BY COUNTRY, EEC
MIL. HEAD
EEC
France
West Germany
Italy
Netherlands
Belgium-Luxembourg
Milk Cows
Sheep & Goats
1952 54 56 58 60 62
Horses, Mules & Donkeys
Sheep & Goats
Milk Cows
Other Cattle
Hogs
Poultry
Source: Statistical Bulletin 351.
U. S. DEPARTMENT OF AGRICULTURE
NEG. ERS 4138-65 (12) ECONOMIC RESEARCH SERVICE

Figure 19

between 1952-54 and 1960-62. During the same interval, there was a decline of 8 percent in the number of sheep and goats, and of 34 percent in horses, mules, and donkeys. Changes in the respective inventories were generally in the same direction for individual countries as for the Community as a whole. Exceptions were the trends in sheep and goat numbers; they increased in France, the Netherlands, and Belgium-Luxembourg, but decreased in the EEC as a whole because of the dominating decreases in West Germany and Italy.

There was a rapid rate of growth in the number of cattle other than milk cows in every country except Italy. This change in composition of cattle numbers may reflect in part the growth of specialized beef production, and the tendency to produce more beef from the dual-purpose herds. Historically, beef production in the EEC was in large measure secondary to dairy production. But during the 1950's and early 1960's, increases in cattle other than milk cows indicated greater emphasis on beef production. This suggests that there may be a much greater degree of substitution in the production of beef and milk than is commonly thought and that the two products do not have to be produced in unalterably fixed proportion.

Changes in the composition of cattle numbers suggest that there may be a basis for assuming that further increases in beef production can come from the beef-dairy industry as it is presently structured and does not have to come from beef breeds under specialized production organization as in the United States. It appears that the EEC increased its beef production base substantially in 1952-62 by using the dairy cattle base as the source of supply.

The number of hogs on farms increased substantially in every member country in 1952-62. The average increase for all countries was 25 percent and was larger than for any other type of livestock in general. Increases in the Netherlands and Belgium-Luxembourg were 49 and 42 percent, respectively--substantially higher than the Community rate.

Sheep and goat numbers declined in total. However, the declines were concentrated in West Germany and Italy while the inventory numbers in the other countries increased moderately. This decline in sheep and goat numbers may represent a shift from extensive agricultural operations to more intensive forms, but it may also reflect the shift toward beef production and the resulting increase in demand for forage by cattle. The sharp decline in horse, mule, and donkey numbers in all countries may also result in part from this movement, although a more significant factor is the mechanization of European agriculture and the corresponding reduction in the need for animal power.

There was also a steady growth in poultry inventory numbers between 1952 and 1962. The increase for the EEC was about 24 percent. The basic flock should, however, place only a minor and short-run constraint upon increasing the output of poultry and eggs since eggs for hatching are obtainable from many sources including foreign ones. The major constraints to faster increases in poultry, egg, and meat production are probably related to the availability of management and individuals with the technical know-how in modern methods. Lack of modern marketing facilities and adequate consumer response to poultry meats may also be of major importance. Moreover, in some areas the protection of monopolistic elements may retard expansion of the supply of poultry to satisfy an "unfilled" potential demand.

Livestock Slaughter and Carcass Weight

As expected, the number of animals slaughtered changed roughly in line with the changes in inventory numbers (fig. 20). This does not, however, confirm a one-to-one relationship either in direction or in rate of change. The actual relationship is a complex one, especially if cattle slaughter in excess of herd replacement needs cuts severely into subsequent production and shows up in cyclical movements of 10 to 15 years in duration. Changes in carcass weight over time also account for the less than perfect correspondence between slaughter and inventory.

Sheep and goat slaughter was high and increasing throughout the period, so inventory numbers fell severely and the production base was reduced steadily year by year. The number of horses, mules, and donkeys on farms in the EEC was depleted in a similar way.

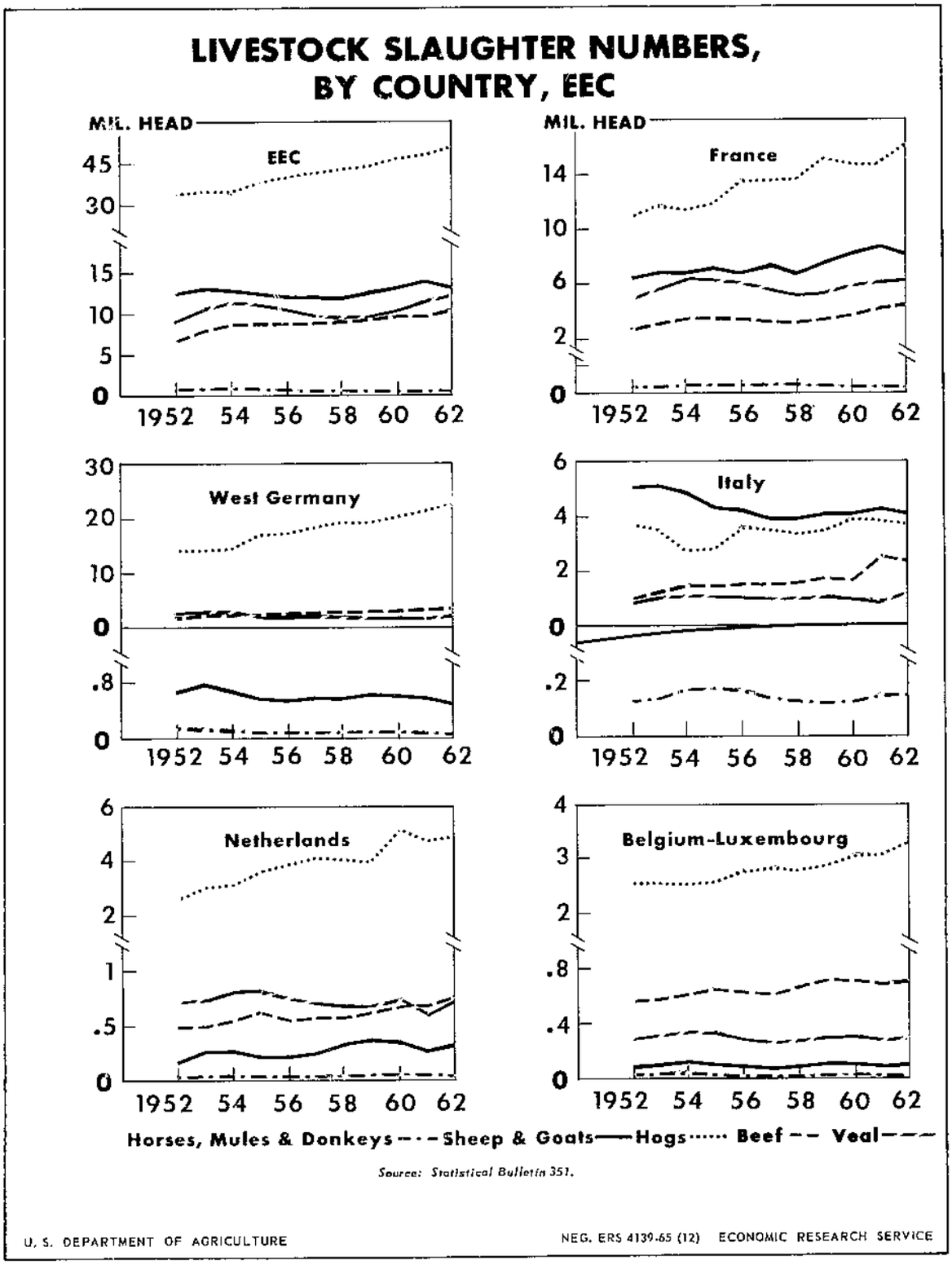
LIVESTOCK SLAUGHTER NUMBERS, BY COUNTRY, EEC
MIL. HEAD
EEC
France
West Germany
Italy
Netherlands
Belgium-Luxembourg
1952 54 56 58 60 62
Horses, Mules & Donkeys
Sheep & Goats
Hogs
Beef
Veal
Source: Statistical Bulletin 351.
U. S. DEPARTMENT OF AGRICULTURE
NEG. ERS 4139-65 (12) ECONOMIC RESEARCH SERVICE

Figure 20

Slaughter numbers of other classes of livestock generally increased faster than inventory numbers. Hog inventory numbers increased 25 percent, while slaughter numbers increased by more than 40 percent. This probably reflects a combination of increased farrowings and larger litter size. Cattle inventory numbers rose about 15 percent and the number of animals slaughtered increased by more than 40 percent. Contrary to hogs, this was largely a cyclical phenomenon, although some improvement in the birth rate may also have occurred.

Some important changes occurred in the average yield of meat from animals that were slaughtered. This could have been due in part to advances in breeding; but it was probably influenced more by economic changes that affected producer decisions.

Between 1952-54 and 1960-62, the average carcass weight for beef in the EEC increased by a very small amount (fig. 21). This was true for all countries except the Netherlands where there was a slight decline.

The carcass yield for veal rose during the study period. This was a significant change amounting to nearly 20 percent for the whole Community. The Netherlands led the veal carcass weight gains with an increase of 84 percent; Italy, with a rise of merely 1 percent, had the lowest gains.

The percentage increase in veal carcass weights more than offsets the concurrent decline in the number of calves slaughtered; therefore, the EEC was able to increase total veal production. The decline in number of calves slaughtered also enabled producers in the EEC to mature more of these animals for "beef" production. This is why beef slaughter numbers increased faster than inventory numbers.

Hog carcass weights have declined in the EEC, especially in West Germany, the Netherlands, and Belgium-Luxembourg. The average weight of hog carcasses rose slightly in France and Italy. The widespread movement toward lighter slaughter hogs may represent a response to a declining demand for animal fat, a trend that is highly consistent with upgrading of the diet that often accompanies rapid economic development. Part of this may, of course, be due to a moderate but persistent decline in the price of hogs relative to the price of other meat animals.

Consumption of Meats

Consumption of meats increased markedly in response to the increase in prosperity in each of the countries of the European Economic Community. However, the rate of increase in total meat consumption differed among countries as a consequence of differences in tastes and in rates of growth of real income and population. Also, the rate of increase of different types of meats varied significantly as demands for them responded differently to changes in incomes and relative prices. Parameters of these changes are not at all clear, and their determination would provide a basis for some useful research. Also, studies relating to adequacy of the marketing system might disclose additional constraints to consumption.

For the EEC as a whole, total meat consumption per person went up from nearly 46 kilograms in 1956 to about 54 kilograms in 1961, an increase of over 17 percent in the 5-year period (fig. 22). However, total meat consumption increased by 23 percent because population also increased. In France, the comparable figures were 12 and 16 percent; in West Germany, 18 and 28 percent; in Italy, 38 and 41 percent; in the Netherlands, 13 and 20 percent; and in Belgium-Luxembourg, 8 and 11 percent.

There was also considerable variation in rates of increase in consumption among the different types of meats. Per capita consumption of beef increased by more than 16 percent, veal increased only about 6 percent, pork almost 13 percent, poultry about 69 percent, other meats almost 16 percent, and offals more than 12 percent. This general pattern of increase was quite widespread.

Levels of meat consumption varied considerably among the countries and were closely associated with differences in levels of income. For example, the highest total meat consumption in 1961 was in France, which also had one of the highest levels of per capita

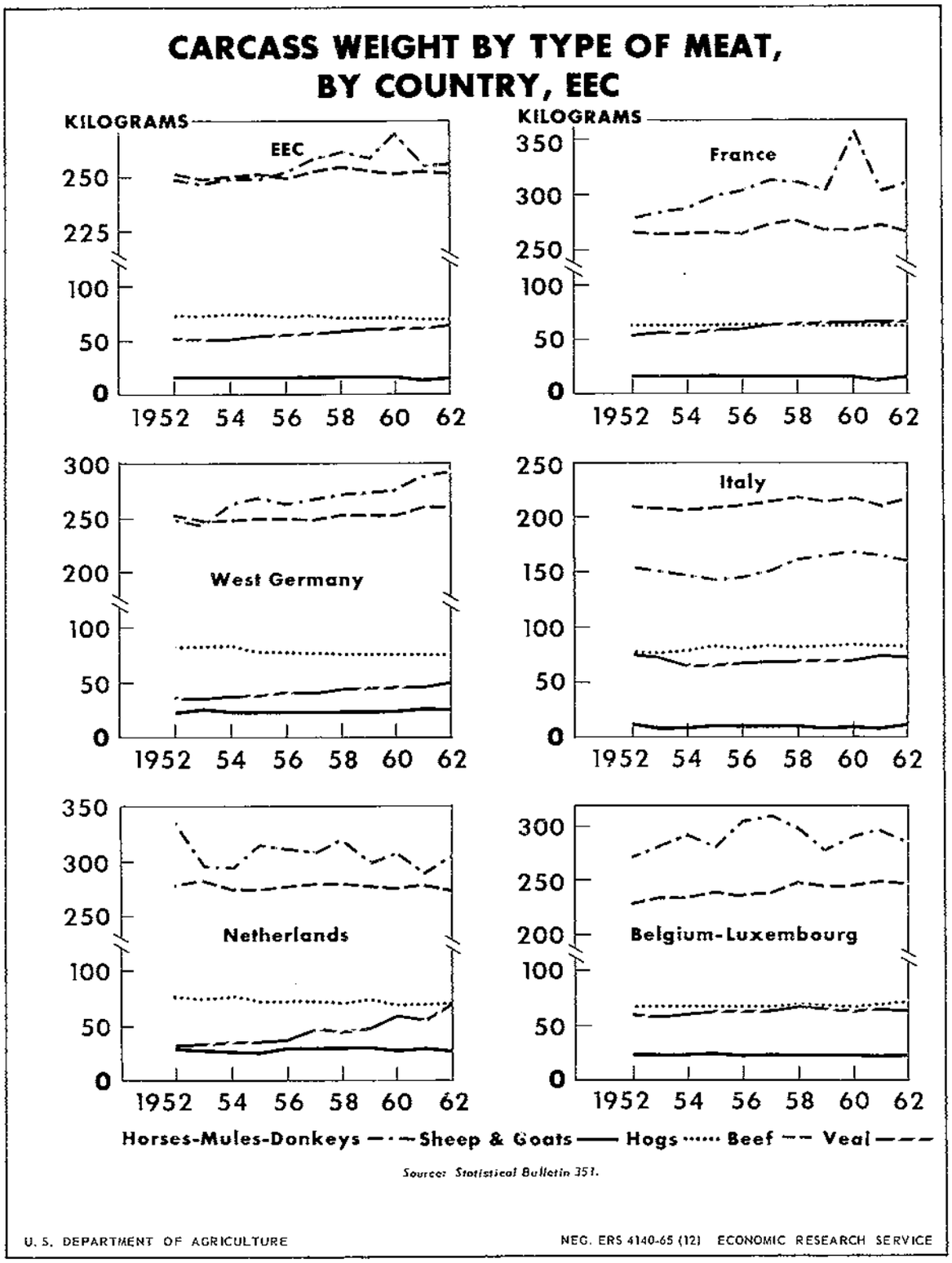
CARCASS WEIGHT BY TYPE OF MEAT, BY COUNTRY, EEC
KILOGRAMS
EEC
France
West Germany
Italy
Netherlands
Belgium-Luxembourg
1952 54 56 58 60 62
Horses-Mules-Donkeys
Sheep & Goats
Hogs
Beef
Veal
Source: Statistical Bulletin 351.
U. S. DEPARTMENT OF AGRICULTURE
NEG. ERS 4140-65 (12) ECONOMIC RESEARCH SERVICE

Figure 21

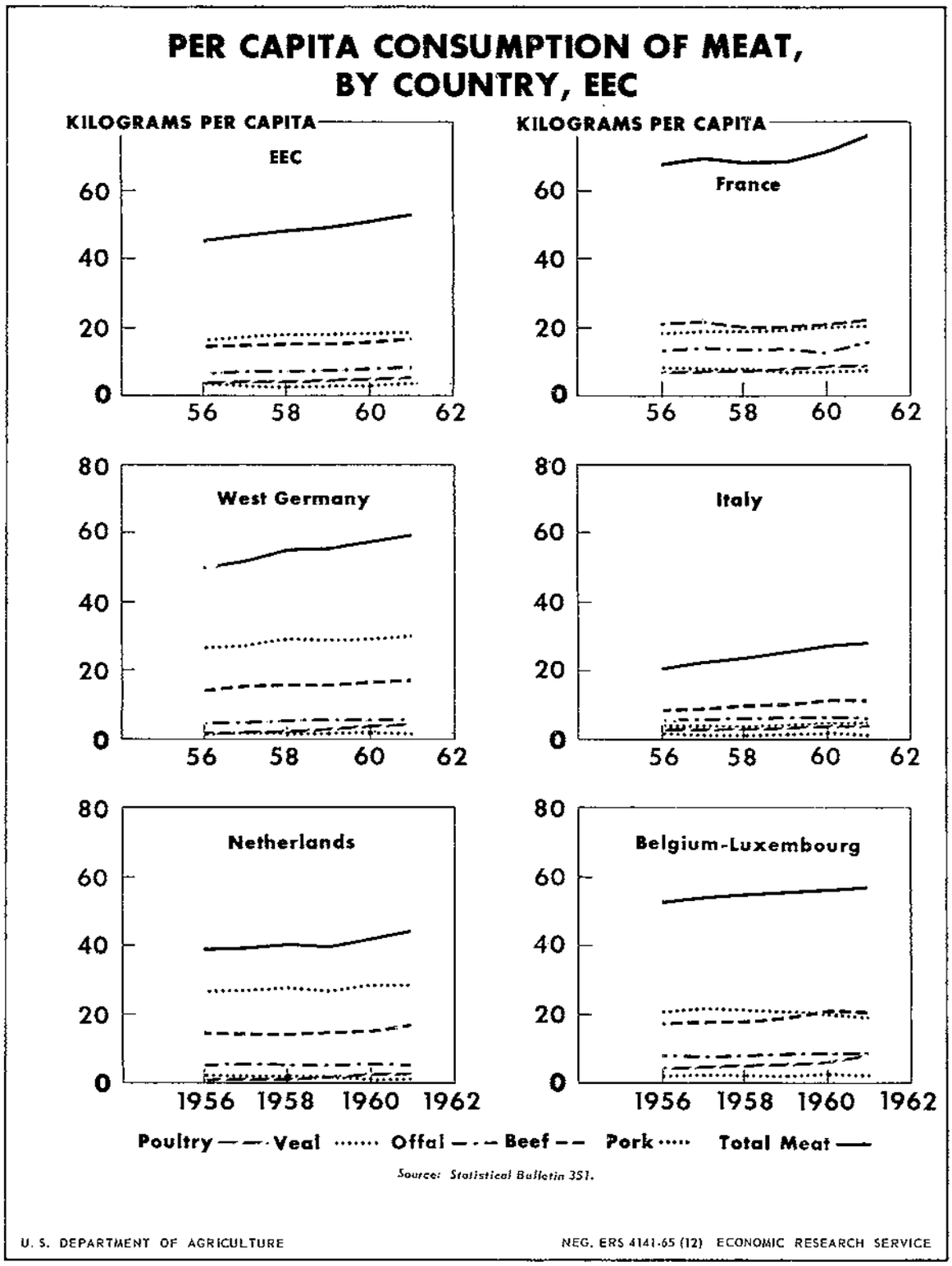
PER CAPITA CONSUMPTION OF MEAT, BY COUNTRY, EEC
KILOGRAMS PER CAPITA
EEC
France
West Germany
Italy
Netherlands
Belgium-Luxembourg
0
20
40
60
80
56
58
60
62
1956
1958
1960
1962
Poultry
Veal
Offal
Beef
Pork
Total Meat
Source: Statistical Bulletin 351.
U. S. DEPARTMENT OF AGRICULTURE
NEG. ERS 4141-65 (12) ECONOMIC RESEARCH SERVICE

Figure 22

income. Here the average consumption was 76 kilograms. In Italy, where incomes were lowest, average consumption of meat was also lowest, being only about 29 kilograms per person. The other countries fell in between: West Germany had a level of 60 kilograms per capita; Belgium-Luxembourg, 58 kilograms; and the Netherlands, 44 kilograms. Although these differences appear to be explained largely by differences in income, national eating habits and differences in levels of meat prices probably cannot be ignored.

Livestock Prices

One of the great problems in moving the European Economic Community toward a common agricultural policy is the unification of prices. Until recently, the separate and divergent policies of the individual members have prevented uniform prices. However, whether by design or economic accident, the prices for a number of kinds of livestock tended to converge in the late 1950's, so that by 1962 some of the differences had been reduced (fig. 23). This was especially true of French livestock prices.

Cattle prices increased in all countries. In Italy, the Netherlands, and Belgium in the early 1950's, they rose only about 10 percent and all were at about the same levels. On the other hand, prices in France were very low relative to those in the other countries. By 1962, they had doubled and had caught up with the level of those in the three previously mentioned countries. West German cattle prices, which were already at a high level in 1952, continued to move sharply upward and thus widened the difference between them and the three countries where prices were more stable.

The movement of hog prices was somewhat more mixed than that of cattle. In Italy, the Netherlands, and Belgium, they moved downward during 1951-62. There was little trend in hog prices in West Germany, but prices in France rose so sharply that they converged to a moderate degree with the prices of Italy, the Netherlands, and Belgium as in the case of beef.

Poultry price levels differed widely at the beginning and at the end of the study period and showed little tendency to converge. On the other hand, milk prices tended to move together but likewise did not converge to any significant degree.

In the relative context, two important price changes can be generalized in spite of the high variance that exists. First, prices of beef and milk relative to prices of pork and poultry tended to rise significantly. This rise indicates the comparative strength of demand for beef and milk. This has significance for (a) the relative strength of demand for feed grains and forage, since these are derived from livestock prices, and (b) the amount of shift that may occur between grain and forage land uses. Second, the price of beef rose moderately faster than the price of milk; this explains--at least in part--the moderate shift from milk to beef production. The economic and biological limits to such a shift constitute an important area for research.

PRODUCTION AND CONSUMPTION OF GRAINS

Historically, the European Economic Community has been deficit in grains. Data for the most recent decade show that the deficit--that is, the difference between domestic production and domestic consumption--has remained annually in the vicinity of 9.5 to 10.5 million metric tons (fig. 24). This deficit has, of course, been satisfied by imports from the United States and other surplus-producing regions of the world.

Throughout the past decade, the production-consumption deficits of West Germany and the three small countries have persisted at a nearly constant level. West Germany has consistently had the greatest deficit, varying annually in the range of 3 to 5 million metric tons. Currently, however, the Italian deficit has grown almost as large as that of West Germany. The current size of the Italian deficit stands in sharp contrast to its status of self-sufficiency prior to 1960. It appears that in recent years the rising demand in Italy for feed grains has been one of the most important factors contributing to this trend.

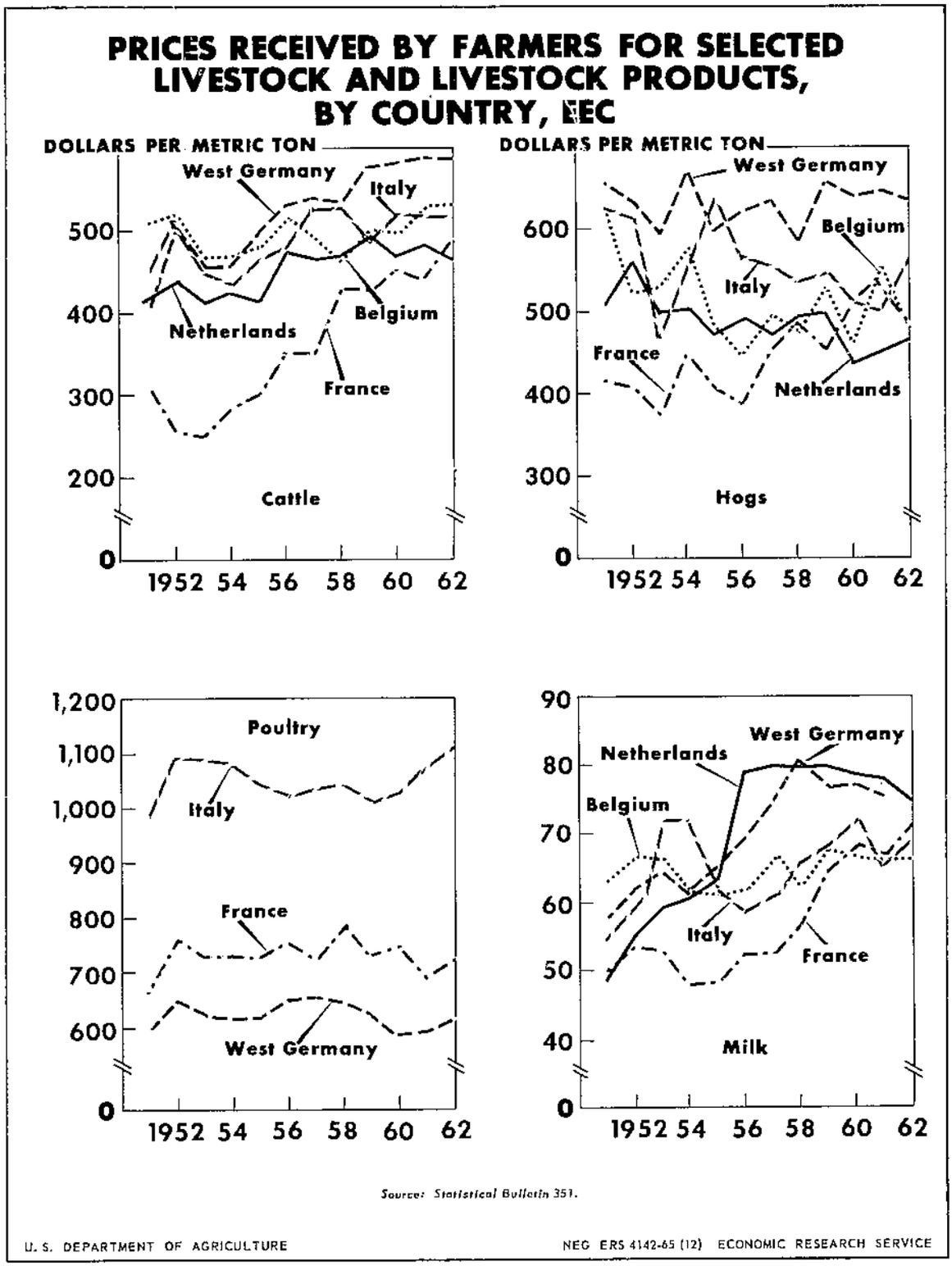
PRICES RECEIVED BY FARMERS FOR SELECTED LIVESTOCK AND LIVESTOCK PRODUCTS, BY COUNTRY, EEC
DOLLARS PER METRIC TON
West Germany
Italy
Belgium
Netherlands
France
Cattle
500
400
300
200
0
1952 54 56 58 60 62
DOLLARS PER METRIC TON
West Germany
Belgium
Italy
France
Netherlands
Hogs
600
500
400
300
0
1952 54 56 58 60 62
Poultry
Italy
France
West Germany
1,200
1,100
1,000
900
800
700
600
0
1952 54 56 58 60 62
West Germany
Netherlands
Belgium
Italy
France
Milk
90
80
70
60
50
40
0
1952 54 56 58 60 62
Source: Statistical Bulletin 351.
U. S. DEPARTMENT OF AGRICULTURE
NEG ERS 4142-65 (12) ECONOMIC RESEARCH SERVICE

Figure 23

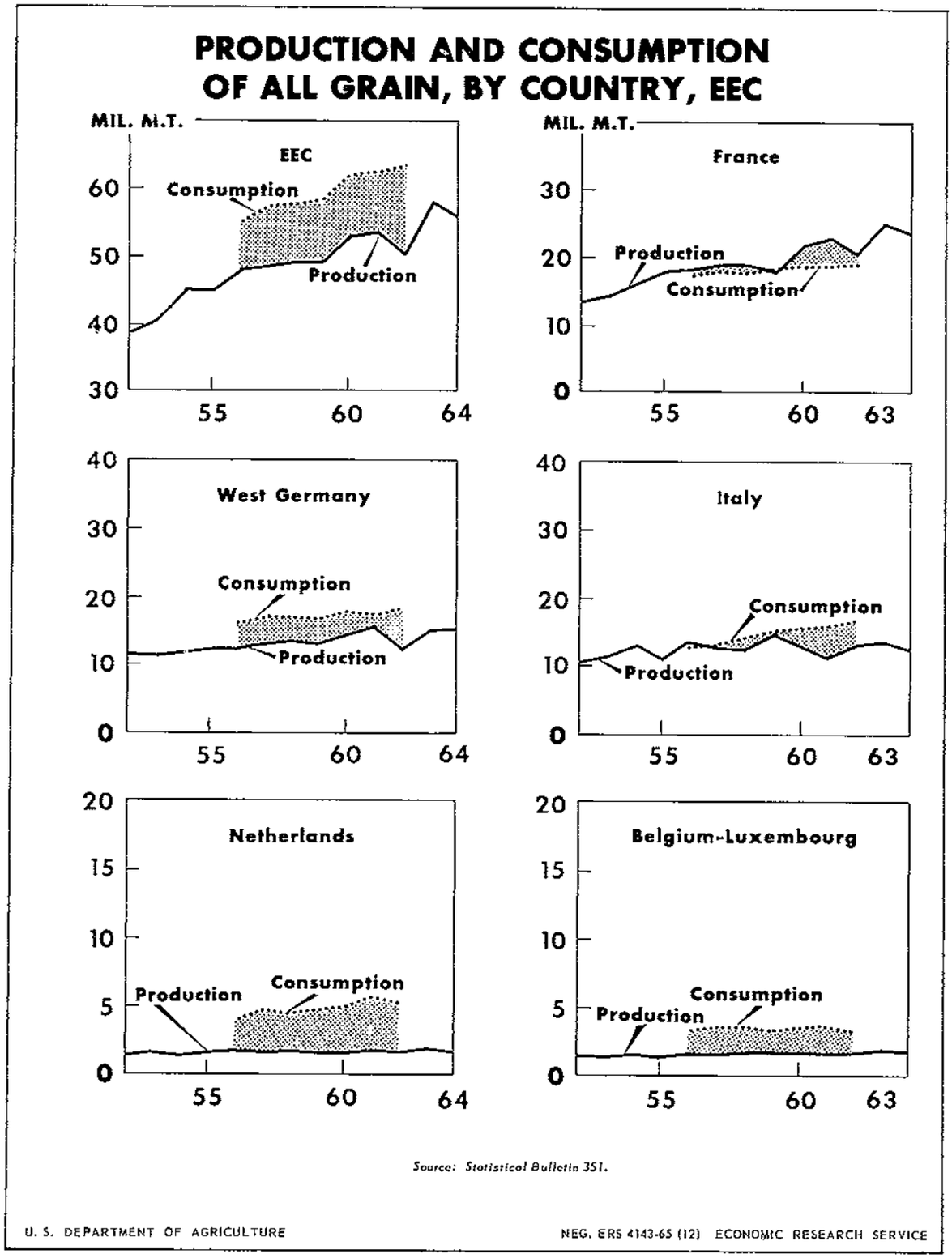
PRODUCTION AND CONSUMPTION
OF ALL GRAIN, BY COUNTRY, EEC
MIL. M.T.
EEC
Consumption
Production
60
50
40
30
55
60
64
MIL. M.T.
France
Production
Consumption
30
20
10
0
55
60
63
West Germany
Consumption
Production
40
30
20
10
0
55
60
64
Italy
Consumption
Production
40
30
20
10
0
55
60
63
Netherlands
Production
Consumption
20
15
10
5
0
55
60
64
Belgium-Luxembourg
Consumption
Production
20
15
10
5
0
55
60
63
Source: Statistical Bulletin 351.
U. S. DEPARTMENT OF AGRICULTURE
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Figure 24

During the period that the grain deficit in Italy was rising, the surplus production of grain in France was rising. In 1963, for example, French surplus production just about offset the Italian deficit. This coincidence does not imply that offsetting trade took place; in fact there was actually little direct exchange.

Although the overall deficit in grains remained fairly constant during the past 10 years, it does not necessarily follow that this trend will project into the future. Present knowledge of the factors that influence production and consumption of grains is at best weak. The constancy of the historic deficit does not imply that influencing variables have also held constant; rather, it means that so far some of the influences that would change the deficit have been countered by those that would cause changes in another direction. How long these forces will continue to be offsetting is a question that is critical to the future of U.S. grain trade with Europe.

Little is known about the meaning and composition of the net deficits in grain. It is known that because of imperfections in the substitution of one grain for another, the countries of the EEC have had to import more grain than is indicated by the difference between consumption and production. It is also known that this discrepancy has continued to increase in the past decade. For example, in 1956-58, the countries of the EEC imported an average of 13.4 million tons per year from each other and from third countries, whereas in 1961-63 an average of 17.2 million tons were imported (fig. 25). Still unknown is the substitution relationships between the various classes, types, and qualities of grain. Little is known about the external and internal market commitments that these countries are facing. More precise knowledge of the details of where and how France is disposing her surplus grain, and of the extent and permanency of the re-export trade that appears to be building up in West Germany and other parts of the EEC would be desirable. These are all questions that are critical to the decisions and sales policies of the major grain exporters of the world.

Production of Grains

Currently, just over 21 million hectares are devoted to grain in the countries of the European Economic Community. This has changed only moderately in the past decade or so. In the early 1950's, the area in grain was about at the same level as now. However, the area rose to just over 22 million hectares in 1957 and then proceeded to decline to the current level.

The above temporal changes in grain area occurred in all countries except France. In France, the decline from 1957 onward did not occur; the area in grains continued to rise so that in the course of the decade, there was a very modest expansion of about 225,000 hectares (fig. 26).

Most of the decline in grain area after 1957 occurred in wheat. For the EEC as a whole, the area of wheat declined by nearly 1 million hectares from 1957 to 1963. This pattern was similar for France and Italy, the two countries that dominate wheat production in the EEC.

The area allotted to coarse grain production increased moderately, by about three-fourths of a million hectares, from 1957 to 1963. This increase was due largely to gains in West Germany and France--the two most important coarse grain producers. In Italy, the area in coarse grains remained virtually unchanged, while in the three small countries the area devoted to these grains actually declined in favor of wheat.

The trends of coarse grain and wheat area in EEC countries are not always consistent either with changes in relative prices or with changes in relative yields. Of course, the reasons may be insufficient information on all of the economic factors that influence the rates of substitution between these crops, or on the physical and biological constraints to production in the various producing regions. Superficially, however, it appears that price and yield responses may be low in most countries of the EEC.

Some rather interesting developments have occurred in farm prices for major grains in the Community. These may reflect upon each government's ability to determine farm prices consistent with environmental conditions. Prior to 1957, when the Treaty of Rome was passed, the wheat-feed grain price relations in all countries except West Germany fluctuated considerably from year to year; these fluctuations suggest that (barring statistical errors) some of the governments may have been short-sighted, unguided by clear objectives, and inexperienced in the regulation of grain prices (fig. 27). This early period stands in sharp

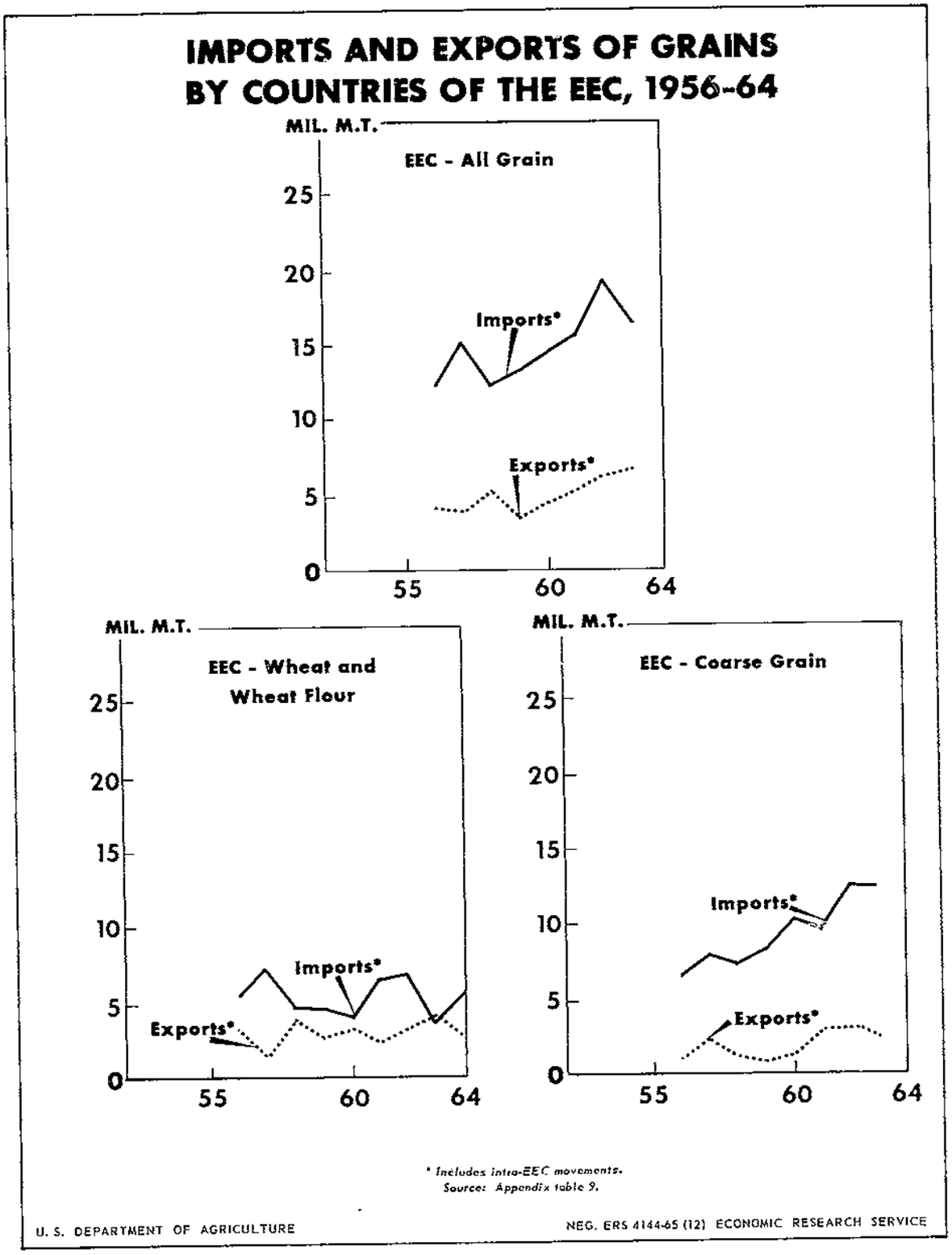
IMPORTS AND EXPORTS OF GRAINS
BY COUNTRIES OF THE EEC, 1956-64
MIL. M.T.
EEC - All Grain
Imports*
Exports*
25
20
15
10
5
0
55
60
64
MIL. M.T.
EEC - Wheat and
Wheat Flour
Imports*
Exports*
MIL. M.T.
EEC - Coarse Grain
Imports*
Exports*
* Includes intra-EEC movements.
Source: Appendix table 9.
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Figure 25

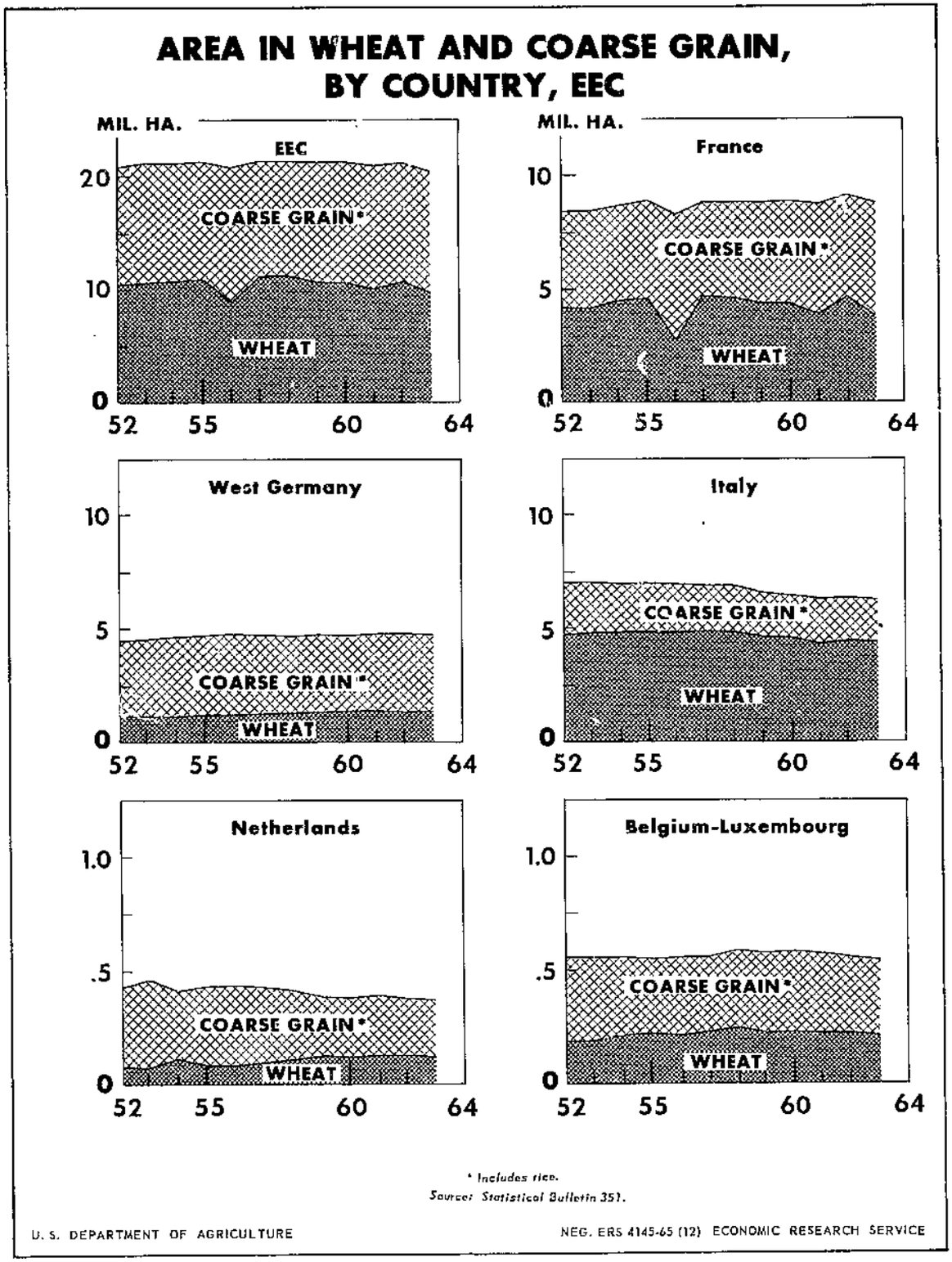
AREA IN WHEAT AND COARSE GRAIN, BY COUNTRY, EEC
MIL. HA.
EEC
COARSE GRAIN*
WHEAT
20
10
0
52
55
60
64
MIL. HA.
France
COARSE GRAIN*
WHEAT
10
5
0
West Germany
COARSE GRAIN*
WHEAT
Italy
COARSE GRAIN*
WHEAT
Netherlands
COARSE GRAIN*
WHEAT
1.0
.5
Belgium-Luxembourg
COARSE GRAIN*
WHEAT
* Includes rice.
Source: Statistical Bulletin 351.
U. S. DEPARTMENT OF AGRICULTURE
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Figure 26

contrast to the post-1957 era when relative grain prices in all countries fluctuated less than before and prices in all countries but Italy began to move determinedly in a direction approaching the feed-value relationship.[14] In this connection, it would be interesting to examine the hypothesis that the objectives of the Treaty of Rome replaced the independent policies.

Yields of all the important grains in each of the countries rose substantially in the past decade. The average yield of all grains was in the vicinity of 20 quintals per hectare in 1952, but by the early 1960's wheat yields had risen to about 24 quintals, barley yields to about 30 quintals, and corn yields to just above 30 quintals. During this same period, there was a very moderate tendency for coarse grain yields to increase somewhat more than wheat yields (fig. 28). This is especially true for corn which has apparently been subject to

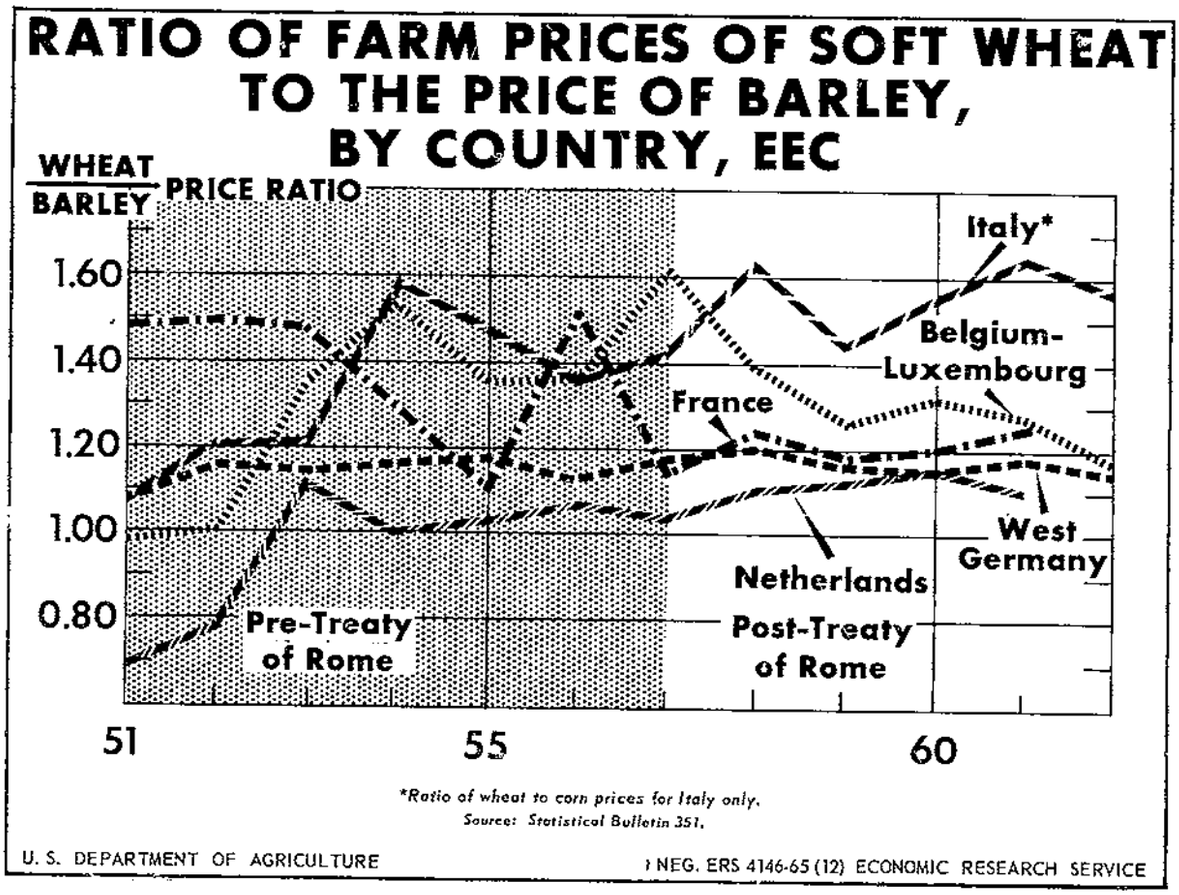

Figure 27

[14] The approximate feed-value relationship of wheat to barley prices is about 1.10 to 1.20.

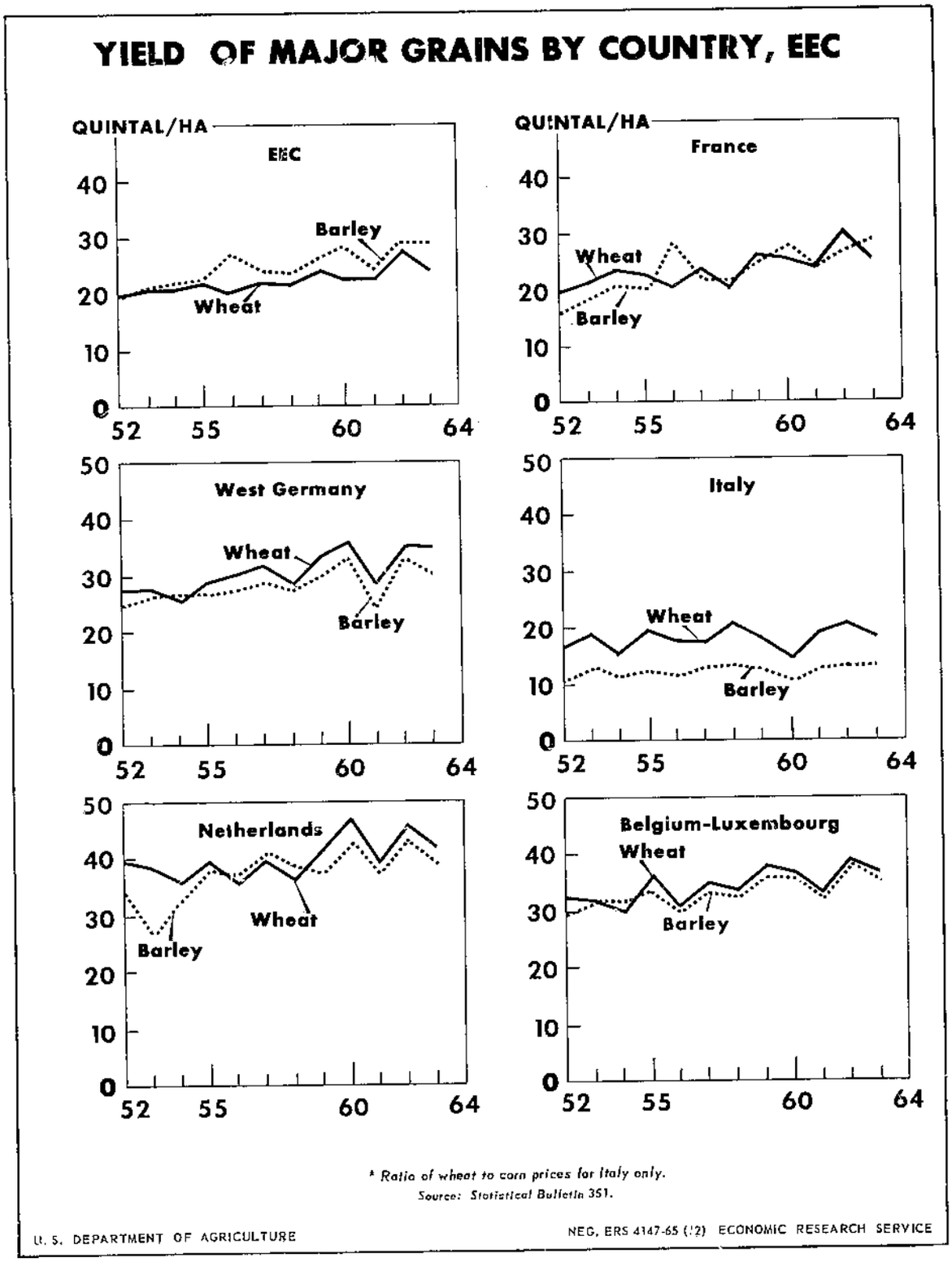
YIELD OF MAJOR GRAINS BY COUNTRY, EEC
QUINTAL/HA
EEC
Barley
Wheat
France
Wheat
Barley
West Germany
Wheat
Barley
Italy
Wheat
Barley
Netherlands
Wheat
Barley
Belgium-Luxembourg
Wheat
Barley
0
10
20
30
40
50
52
55
60
64
* Ratio of wheat to corn prices for Italy only.
Source: Statistical Bulletin 351.
U. S. DEPARTMENT OF AGRICULTURE
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Figure 28

considerable hybridization and increased fertilization in both France and Italy, the two important corn-growing areas. Average barley yields have not risen quite so rapidly.

The average diverging pattern of the respective grain yields is partly a result of changes in the relative importance of the respective crops in each country. When one studies the yield patterns in EEC countries, it is difficult to suggest any important changes in relative yields of barley and wheat in any of them. The only significant change in relative yields occurred in Italy where corn yields rose rapidly.

In general, the pattern of relative yields does not seem to offer an obvious explanation of changes in the pattern of land use. Even in Italy, coarse grain area (corn) declined in spite of increasing relative yields of corn. This, however, may have been so because the relative prices of wheat rose during the late 1950's and early 1960's; thus, the increases in wheat prices may have had an offsetting influence on the allocation of grain area.

In France, neither price nor yield seemed to offer a satisfactory reason for the increase in coarse grain area at the expense of wheat. The modest post-1957 increase in the relative price of wheat should have increased the proportion of land used for wheat. Trends in yields of each of the crops were roughly similar and provide no basis of explanation. This lack of explanation would seem to warrant some research in depth into crop production in France. An examination of the spatial distribution of the respective crops and the differential substitution possibilities with other forms of land use (including the reclamation of idle land), as well as other factors not discussed here, may offer some explanation.

In West Germany, price and yield changes seem to offer little explanation of the allocation of grain area to wheat and coarse grains. Here, however, the question is complicated further by lack of movement or of variance in the respective statistics. In the Netherlands, the rise in the relative price of wheat since 1957 seems to be consistent with the rise in the area of wheat. In Belgium-Luxembourg, the fall in relative wheat prices is consistent with the comparatively greater decline in coarse grain area since then.

The aggregate effect of the foregoing area adjustments and yields has been an increase in production of virtually every major class of grain in every country of the EEC (fig. 29). Trend increases seem to have been primarily a function of the rate of technological adoption, while annual fluctuations are probably associated closely with changes in weather and the winter survival of fall plantings of wheat and other grains.

The impact of weather and technology upon the various grain crops produced in the EEC would seem to be a useful area of research. With regard to technology, an assessment of its current state would be a practical starting point. This, coupled with improved knowledge about technology that is available (but still unused), and with an estimate of the rate of adoption, would be invaluable for projecting future production potentials.

Consumption of Grains

Currently, the countries of the European Economic Community consume over 65 million metric tons of grain a year. Some 55 percent of this is consumed as feed for livestock; about 35 percent as food for human consumption; and the balance, about 10 percent, for seed and a variety of industrial purposes (fig. 30). The relative importance of the various uses has changed considerably even in the short period 1956-63. In 1956, for example, when the EEC consumed only 55 million metric tons, about 47 percent was used for feed, 43 percent for food, and again about 10 percent for other uses. This change in proportions since 1956 reflects increases in demand for animal products and the resulting production response.

The bulk of the grain consumed for food is, of course, wheat. However, a considerable quantity of wheat is also fed to livestock (fig. 31). This latter use has been increasing slowly but persistently. Most of this increase occurred in France where the relative price of wheat declined sharply during the 1950's.[15] In West Germany, the trend in wheat consumption for

[15]The ratio of soft-wheat prices to barley prices for the period between 1951-53 and 1960-62 has declined in France from 1.48 to 1.24 and increased in all other countries--in West Germany from 1.12 to 1.16; in Italy from 1.25 to 1.38; in the Netherlands from .83 to 1.12; and in Belgium-Luxembourg from 1.09 to 1.25.

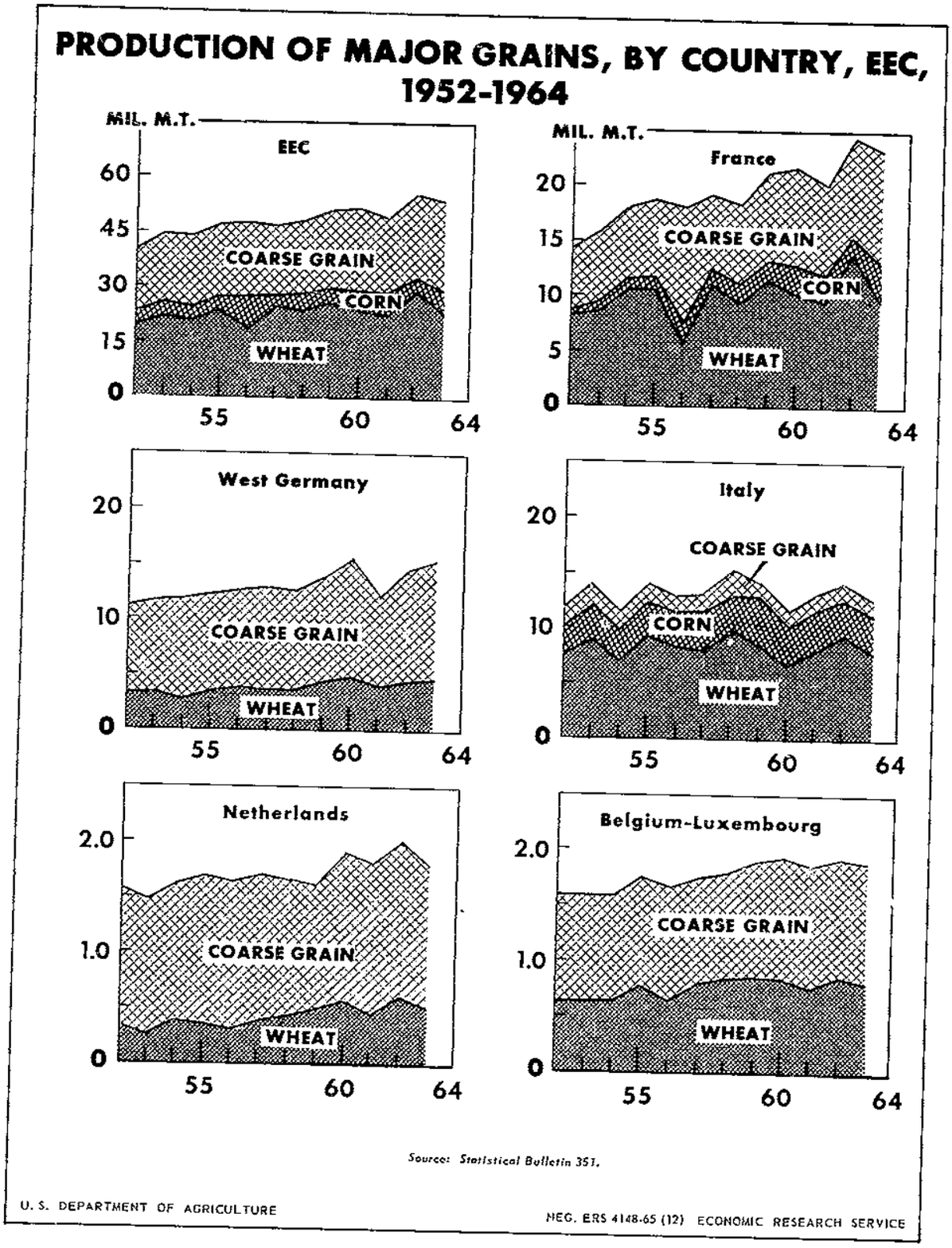
PRODUCTION OF MAJOR GRAINS, BY COUNTRY, EEC, 1952-1964
MIL. M.T.
EEC
60
45
30
15
0
COARSE GRAIN
CORN
WHEAT
55
60
64
MIL. M.T.
France
20
15
10
5
0
COARSE GRAIN
CORN
WHEAT
55
60
64
West Germany
20
10
0
COARSE GRAIN
WHEAT
55
60
64
Italy
20
10
0
COARSE GRAIN
CORN
WHEAT
55
60
64
Netherlands
2.0
1.0
0
COARSE GRAIN
WHEAT
55
60
64
Belgium-Luxembourg
2.0
1.0
0
COARSE GRAIN
WHEAT
55
60
64
Source: Statistical Bulletin 351.
U. S. DEPARTMENT OF AGRICULTURE
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Figure 29

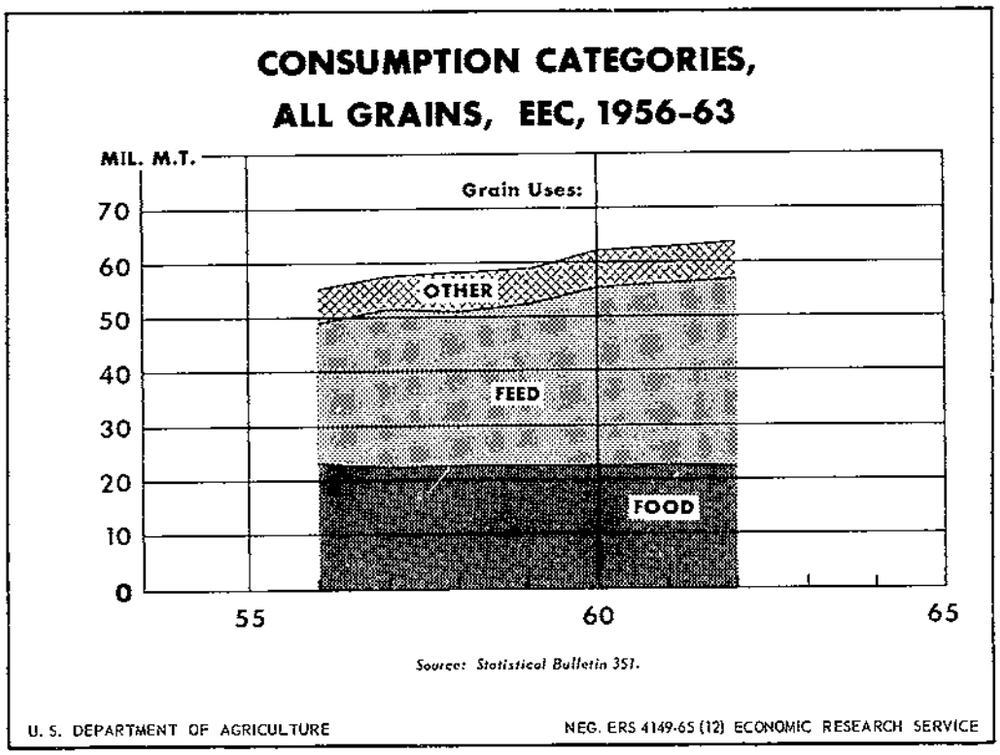


Figure 30

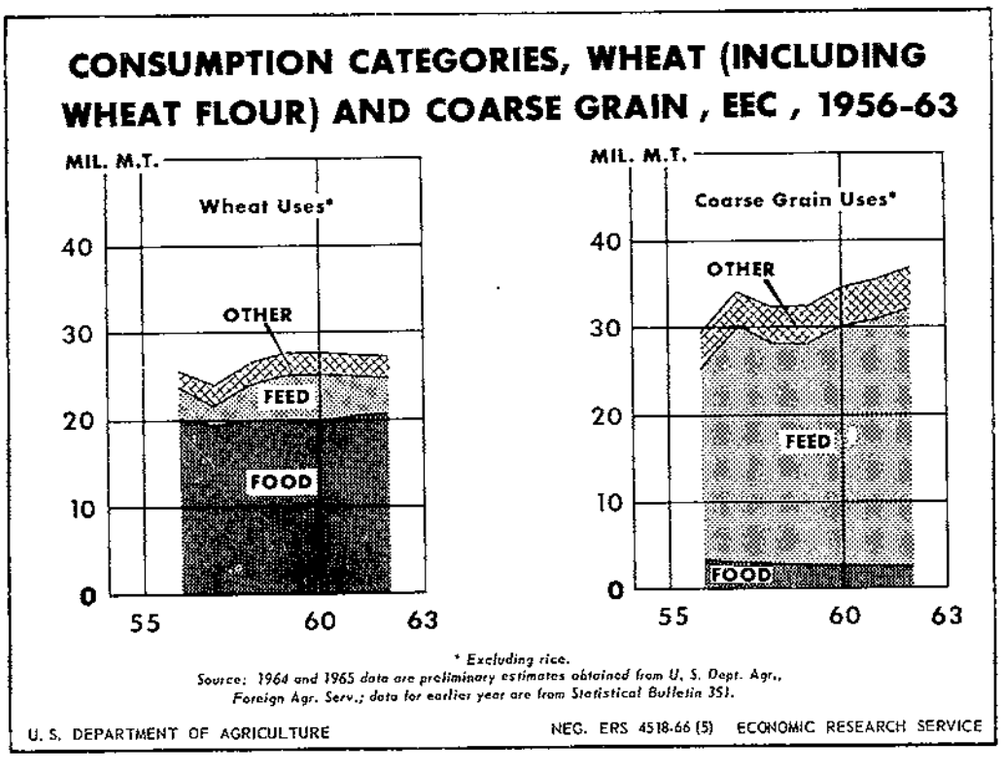


Figure 31

feed also increased; however, the stimulus did not appear to come from price, although there was a small price change. In the other countries, the change in price relatives also did not affect relative consumption, and the amount of wheat used for feed was insignificant.

The foregoing trends in consumption of wheat for feed point to some important unknowns regarding the whole gamut of substitution relationships in the use of wheat. This is a relevant question in assessing the future demand not only for U.S. wheat but also for feed grains. This question is particularly relevant now that unified grain prices have been announced for 1967-68. These indicate that the price of wheat at the farm may become cheaper in relation to feed grains than in the past decade. The estimated farm price of average quality wheat is expected to be only 10 percent above the price of average quality barley when adjusted to a feed-value basis. The expected relationship should bring more wheat into feed use. This hypothesis raises a further question: What is the impact of future increases in per capita incomes upon the demand for high-quality imported wheats, and hence upon the discount for the domestic portion that is of low quality and would have to be exported or fed?

As one might expect, the coarse grains--oats, barley, rye, corn, and speltz--are used chiefly for feed. In 1963, about 80 percent of the coarse grains were used in this way. The rest of the coarse grains were used for food, seed, and for miscellaneous industrial purposes. The quantity of coarse grains in nonfeed uses has changed little in the past 8 to 10 years. However, the amount used as feed has risen sharply.

The proportion of coarse grains utilized as food varies little from country to country. The most outstanding exception is West Germany where considerable amounts of barley are apparently used in the manufacture of malt and substantial quantities of rye are still used by the baking industry. In total, the nonfeed uses of coarse grain have declined slightly relative to feed uses--from about 24 percent in 1956 to about 19 percent in 1963.

The tremendous increase in demand for meat has led to sharply rising demand for feed grains in the past decade. In nearly all countries, producers have responded so that the number of grain-consuming animal units has risen sharply in the EEC (fig. 32).[16] In 1956-62, the number of animal units rose from 87 to 102 million--an increase of more than 17 percent. The fastest and most important increases in the number of grain-consuming animal units occurred in France and West Germany. By 1962, these two countries contained fully two-thirds of the total grain-consuming animal units in the EEC.

Part of the increase in demand for feed grain was attributable to increases in the rate of feeding (fig. 32). In France and West Germany, the increases were fairly steady but moderate. The greatest rate of increase occurred in Italy where the feeding rate increased from about one-fifth of a ton per animal unit in 1956 to more than one-third of a ton by 1962. The heaviest rates of feeding took place in the three small countries. Although their rates did not increase in the past decade, they ran persistently above two-fifths of a ton per animal unit.

Increases in grain-feeding rates in the EEC are what one might expect under conditions of sharp increases in demand for meat. There are, however, a number of unanswered questions. For example, are the economic and technological relations in European agriculture such that the high rates of feeding in the three small countries represent an asymptote? Or, are conditions sufficiently different in each of the countries so that feeding rates in each are asymptotic at some different level? This has particular relevance to Italy, which currently consumes 20 percent of the EEC's feed grains. The rates in Italy have been increasing sharply and are currently at about the French and West German levels. How much higher will they go?

---

[16] Grain-consuming animal units represent a weighted total of the number of units of each of the various classes of livestock, such that they are approximate equivalents in terms of the grain consumed by each. The method and weights used for deriving total grain-consuming animal units are the same as those in Jennings, R. D. Consumption of Feed by Livestock, 1909-56. U.S. Dept. Agr., Agr. Res. Serv., PRR 21, Washington, D.C., 1958.

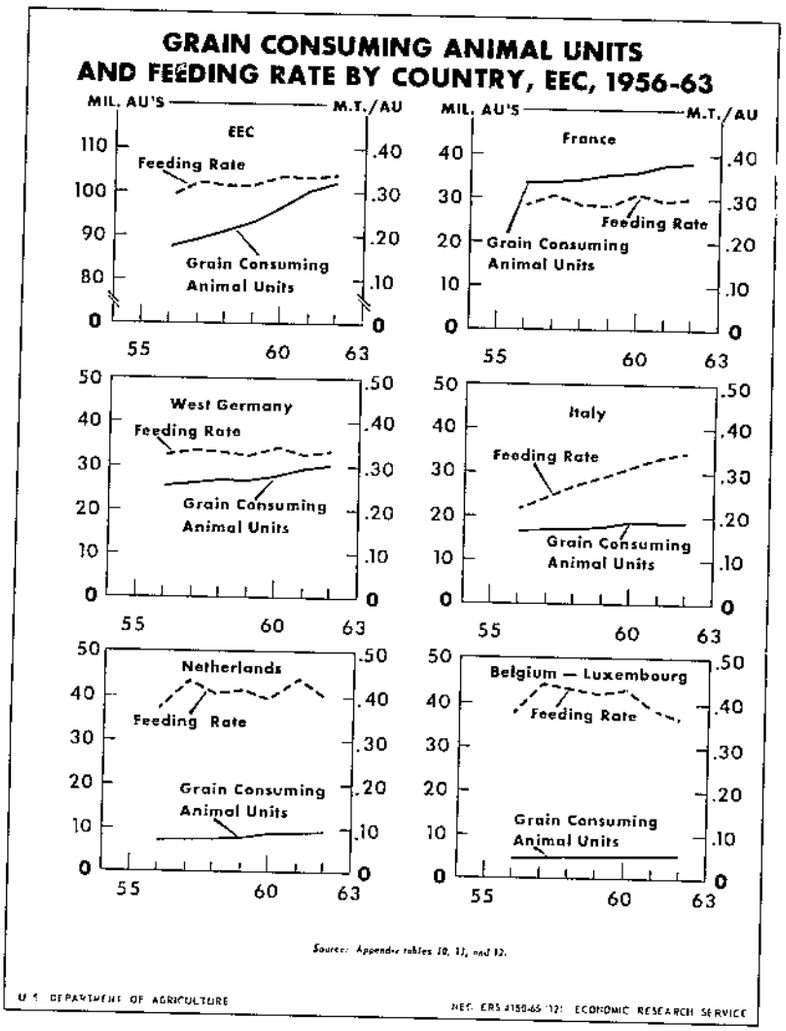


Figure 32

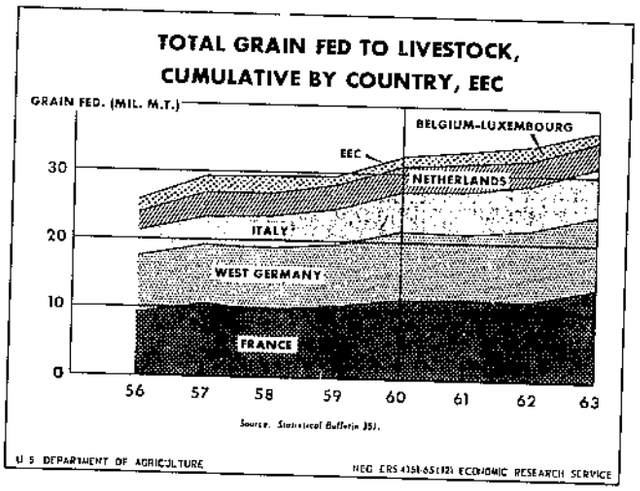


Figure 33

The combination of increases in rates of feeding and increases in the number of grain-consuming animal units has, as indicated earlier, led to sharp increases in the total amount of grain consumed in the EEC. The largest amount of grain is fed in France. In 1963, French livestock consumed almost 14 million metric tons of coarse grains and wheat, some 37 percent of the grains fed in the EEC. This contrasts with West Germany and Italy where only 10 million and 7 million metric tons, respectively, were utilized in this way. About 5 million metric tons were consumed in the three small countries (fig. 33).

Future changes in feed consumption are obviously the key to the future of the EEC as a market for U.S. feed grains. Therefore, an understanding of the factors that influence feed grain consumption in the several member countries is essential. This would require that each country's situation be examined with respect to its physical and biological potential for the production of grain-consuming livestock. It would also require the examination of policy and policy direction to determine the areas and means by which either production or consumption of livestock, or both, might be encouraged in the future.

Although the amount of grain used for food has been constant for more than a decade, food uses still comprise an important part of total grain consumption. In 1963, some 22.5 million metric tons of grain were used for food, compared with 36.6 million metric tons for livestock feed. Italy is the largest single consumer of food grains, with nearly 9 million metric tons used annually. West Germany and France rank next with roughly 6 million metric tons each, while the three small countries together use only about 2 million metric tons (fig. 34).

To an important degree, total consumption of food grains depends upon size of the consuming population. However, there are substantial differences in per capita food consumption. Per capita consumption in Italy is by far the highest of any of the countries of the EEC; it has held virtually constant at 170 to 175 kilograms per capita per year since the mid-1950's. France is the only other country where per capita consumption has held roughly constant: however, this has occurred at a level of 130 to 135 kilograms per year.

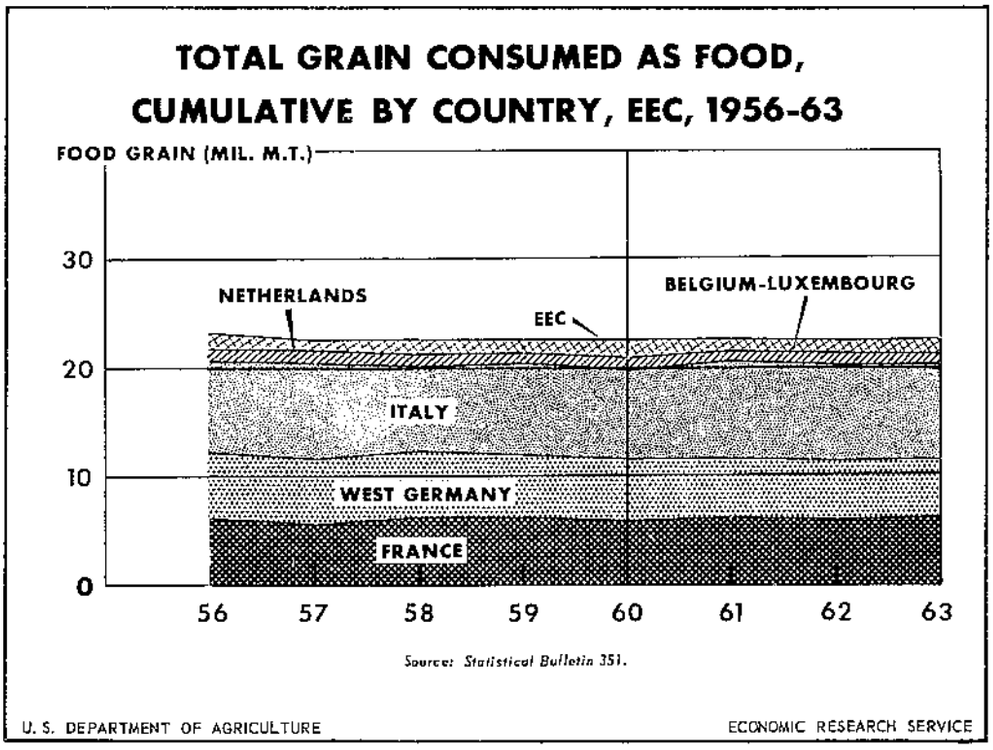


Figure 34

Per capita consumption of food grains has trended sharply downward in West Germany and the three small countries. This is moderately surprising since grain consumption in these countries is already comparatively low. The decline in Germany is the most pronounced and persistent; by 1962, per capita food grain consumption had fallen from the 1956 level of 120 kilograms per year to a level of 95 kilograms. In the Netherlands and in Belgium-Luxembourg, the drop was not so persistent. Consumption in the Netherlands fell from a level of 115 kilograms per capita in 1956 to 105 kilograms in 1962, while in the remaining two small countries it fell from 135 to 120 in the same interval (fig. 35).

Changes in per capita consumption are commonly attributed in large part to changes in prices or incomes. However, these two variables alone do not seem to provide a satisfactory explanation for changes in food grain consumption in the respective countries. Much of the problem arises because there is not yet sufficient data from which price, income, and substitution effects can be estimated.

In a very general way, trends in food grain consumption appear to be consistent with trends in income and prices in the EEC (fig. 35). However, year-to-year fluctuations do not seem to be so readily explainable. In cases such as West Germany, the Netherlands, and Belgium-Luxembourg, rising incomes and rising prices seem consistent with the declines experienced in per capita consumption.[17] However, similar price and income movements in France do not seem to be consistent with constancy of the temporal pattern of per capita intake; nor is the pattern of declining price and rising income in Italy totally consistent with the trend in consumption. Of course, price changes in grain relative to other foods have been ignored in making these comparisons.

PRODUCTION AND CONSUMPTION OF FORAGE

Forage, an important element of the European Economic Community's agriculture, is the base upon which a large part of the production of livestock and livestock products takes place.

Forage-consuming livestock also consume significant amounts of grain. In general, there is a fairly wide range of substitution between the two types of feed in the production of these animals. This means that the relative amounts of forage and grain fed to livestock depend not only on the relative numbers of total forage- and grain-consuming types of animals, but also on the relative prices of the two types of feed, changes in feeding technology, and farmers' preferences for the different kinds of feed. These factors have considerable significance for the supply as well as for the demand for feed. Grain can be imported readily, but the importation of forage in large quantities is limited because of the bulkiness and high costs involved. Therefore, forage needs of the EEC must be supplied almost exclusively from domestic production and probably highly localized production.

Resources required to achieve this production--land, labor, and capital--compete against demands for other crops. In terms of the quantity and kinds of resources involved, grain is the most important of these. In the past, economic conditions seem to have favored forage production so that resources were diverted from grain and other crops to forage.

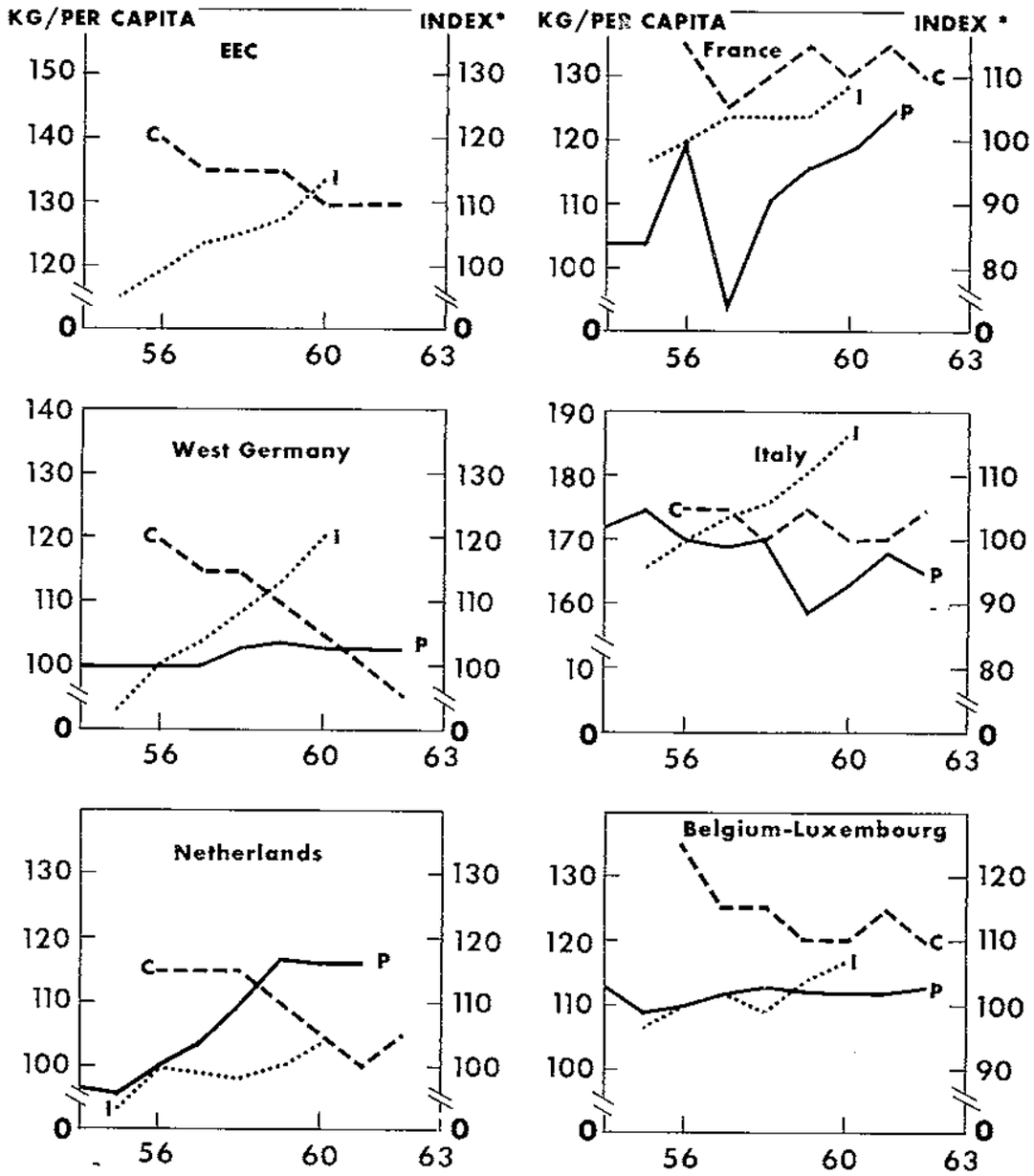
Production of Forage

For the European Economic Community as a whole, the area in hay, silage, and permanent pasture rose moderately during the 8-year period 1951-58 (figs. 36-38). The sudden increase in forage area between 1955 and 1956 resulted only from a change in definition and in reporting for permanent pasture in France, and therefore should be discounted. Otherwise, there was an accelerated increase in hay and silage area between 1955 and 1958 in France and Italy, a slight decline in West Germany, and little change in the Low Countries.

Over the relatively short period reported, there were some marked changes in forage yields. Hay and silage yields went up, especially in Belgium-Luxembourg and France.

[17] Assuming that both price and income have negative coefficients in regard to their influence on consumption.

PER CAPITA CONSUMPTION OF GRAINS (C), PER CAPITA CONSUMPTION EXPENDITURE (I) AND PRICE OF WHEAT AT THE FARM LEVEL (P), BY COUNTRY, EEC, 1956-62



* This scale applies to (I) and (P) only (1956=100).

Source: Appendix table 13 and Statistical Bulletin 351.

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Figure 35

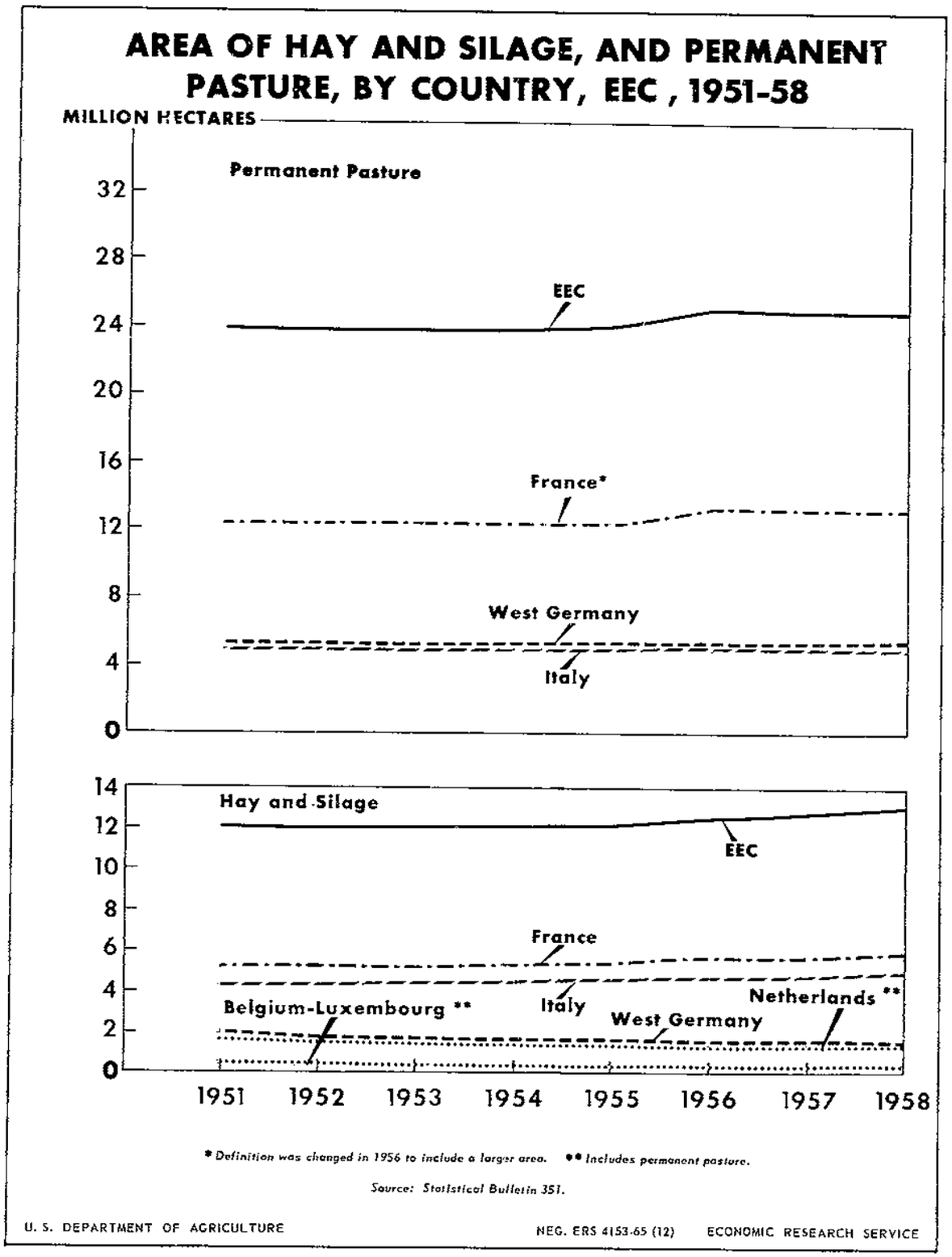
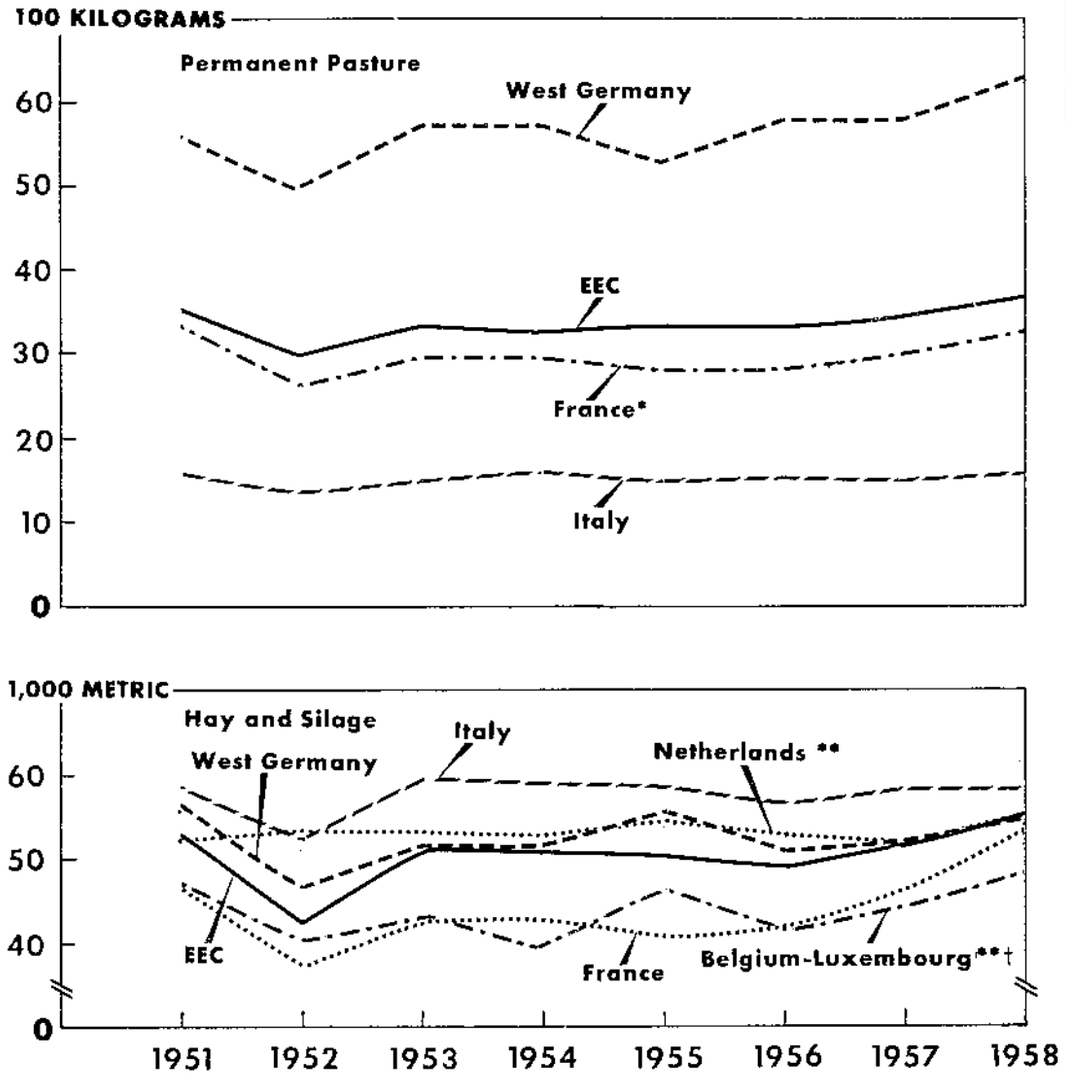

AREA OF HAY AND SILAGE, AND PERMANENT PASTURE, BY COUNTRY, EEC, 1951-58
MILLION HECTARES
Permanent Pasture
32
28
24
20
16
12
8
4
0
EEC
France*
West Germany
Italy
Hay and Silage
14
12
10
8
6
4
2
0
EEC
France
Belgium-Luxembourg **
Italy
West Germany
Netherlands **
1951
1952
1953
1954
1955
1956
1957
1958
* Definition was changed in 1956 to include a larger area. ** Includes permanent pasture.
Source: Statistical Bulletin 351.
U. S. DEPARTMENT OF AGRICULTURE
NEG. ERS 4153-65 (12)
ECONOMIC RESEARCH SERVICE

Figure 36

AVERAGE YIELD (DRY-WEIGHT BASIS) OF HAY AND SILAGE, AND PERMANENT PASTURE, BY COUNTRY, EEC, 1951-58



* Definition was changed in 1956 to include a larger area. ** Includes permanent pasture. † Based on first cutting only.

Source: Statistical Bulletin 351.

U. S. DEPARTMENT OF AGRICULTURE NEG. ERS 4154-65 (12) ECONOMIC RESEARCH SERVICE

Figure 37

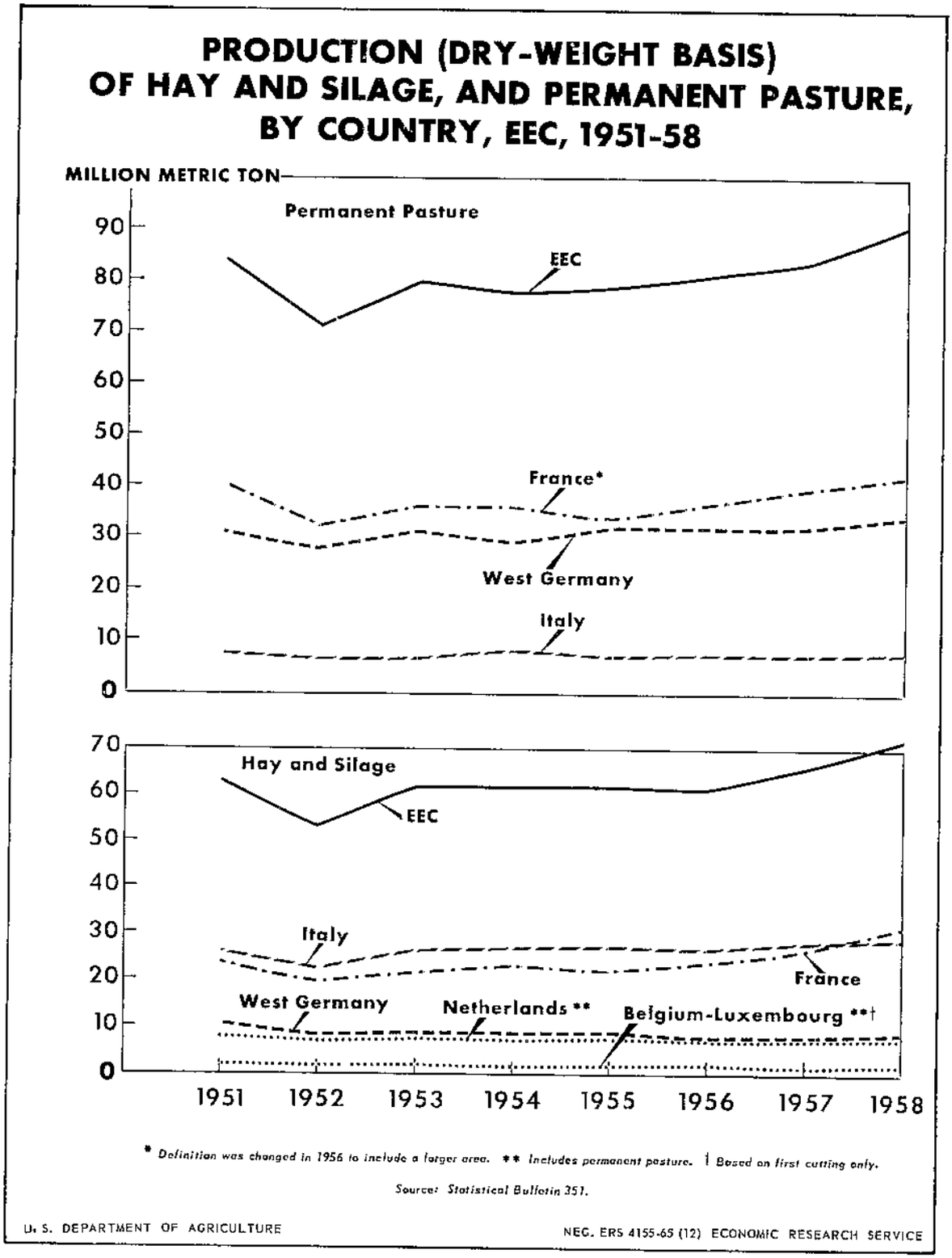

PRODUCTION (DRY-WEIGHT BASIS)
OF HAY AND SILAGE, AND PERMANENT PASTURE,
BY COUNTRY, EEC, 1951-58
MILLION METRIC TON
Permanent Pasture
EEC
France*
West Germany
Italy
90
80
70
60
50
40
30
20
10
0
Hay and Silage
EEC
Italy
France
West Germany
Netherlands **
Belgium-Luxembourg **†
70
60
50
40
30
20
10
0
1951
1952
1953
1954
1955
1956
1957
1958
* Definition was changed in 1956 to include a larger area. ** Includes permanent pasture. † Based on first cutting only.
Source: Statistical Bulletin 351.
U. S. DEPARTMENT OF AGRICULTURE
NEG. ERS 4155-65 (12) ECONOMIC RESEARCH SERVICE

Figure 38

There was a moderate increase in these yields in West Germany, while yields in Italy and the Netherlands held about constant. Increases in yields from permanent pasture were estimated to be substantial in West Germany, but much less so in France and Italy.

The differences among countries in levels of yields is striking. Italy had the highest yields of hay and silage, but the lowest of permanent pasture. West Germany had outstandingly high permanent pasture yields. Hay and silage yields reported for Belgium-Luxembourg were low but were biased severely downward because they were based on production from first cuttings only.

Changes in production of forage in the EEC appear to have been dominated by changes in yield, with area changes playing a less important, but not insignificant, role. In general, there has been a substantial increase in forage production with a rather sharp increase occurring in 1956-58.

There are many factors important to the forage production potential of the EEC for which there is little information. In part, this stems from the high level of aggregation of the published data on forage production which prevents making intercountry comparisons of individual components. The matter of the wide differences in yields among countries is particularly important. To what extent are these differences due to climatic and soil differences, or to differences in cultural practices, or to differences in reporting? Answers to these questions would give some idea of the possible responsiveness of forage production to changes in relevant economic incentives, particularly the grain-forage price ratio. This would involve better information about the substitution possibilities between forage and other crops in production on individual farms. Most forage is fed on farms where it is produced, while feed grains can be fed or sold as a cash crop. The degree to which forage and feed grains compete for the same resources would depend on the ability and willingness of farmers to make adjustments readily.[18]

Consumption of Forage

As discussed earlier, a production-consumption identity is assumed for forage in the European Economic Community; that is, all produced is assumed to be used. Undoubtedly, there are stocks of forage carried over from year to year and the size of these stocks varies over time. In this respect, production and consumption are not equal in any one year. However, such data are not available, and, therefore, cannot be introduced explicitly into this analysis.

Demand for forage is based on the number of forage-consuming animals and forage-feeding rates (fig. 39).[19] The number of such animal units increased in the EEC from

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[18]Published data are available only for total hay, silage, and permanent pasture for 1951-58. However, data have been published on major components of these forage groups for 1951-62. These data on area and production are presented in Appendix tables 14 and 15. They are also expressed as a percent of the 1951-58 series for those years in which the different data series overlap.

In addition to the forage crops listed above, there are other important forage sources from various root crops, such as forage beets and potatoes, and from grains used as forage. Unfortunately, data are not available on how much of the total area and production of these crops is devoted to forage uses. Therefore, not much can be said about them other than that from a knowledge of livestock feeding in the EEC they are of considerable importance as a source of forage. Further information on these sources of forage would be most useful.

[19]A series of the total number of forage-consuming animal units was derived for the EEC and the individual countries by using Jennings' method. This was done by applying Jennings' weighting factors to the inventory numbers of the different types of forage-consuming livestock, and summing over the different types. The livestock classes and the corresponding weights used are: milk cow, .990; other cattle, .975; cattle under 2 years of age, .782; horses, mules, and donkeys, .737; and sheep and goats, .200. Jennings, R. D. Consumption of Feed by Livestock, 1909-56. U.S. Dept. Agr., Agr. Res. Serv., PRR 21, Washington, D.C., 1958, p. 64.

slightly over 47 million in 1952 to nearly 52 million in 1962--an increase of slightly over 9 percent. Most of the increase occurred in France, with relatively small and insignificant increases in other countries. Total consumption of forage by these animals in 1952-58 is assumed to be equal to the amount produced.

Total forage consumption per animal unit, as derived from the foregoing data, went up sharply in France, West Germany, and Italy during the late 1950's; the proportions were 30, 27, and 34 percent, respectively (fig. 40). There were slight declines of 3 percent in the Netherlands and 4 percent in Belgium-Luxembourg. The marked increases in forage consumed per animal unit may have resulted from the combined influence of the trend toward larger animals as reflected by carcass weight and a trend toward more intensive forage feeding. It is difficult to test either of these hypotheses from the data available.

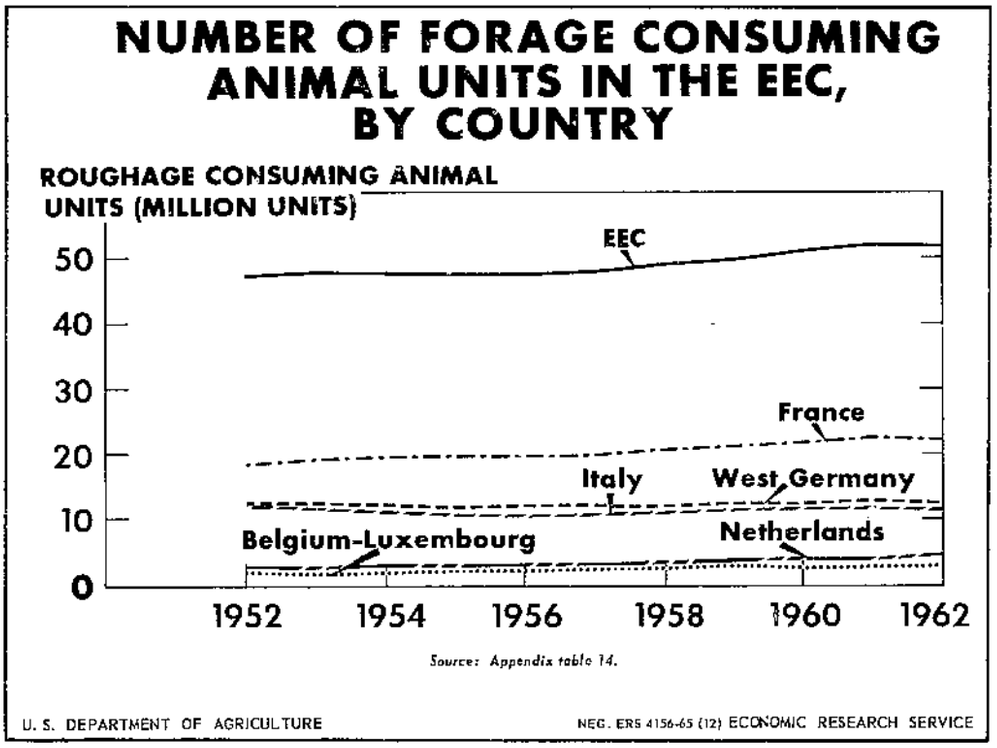

Figure 39

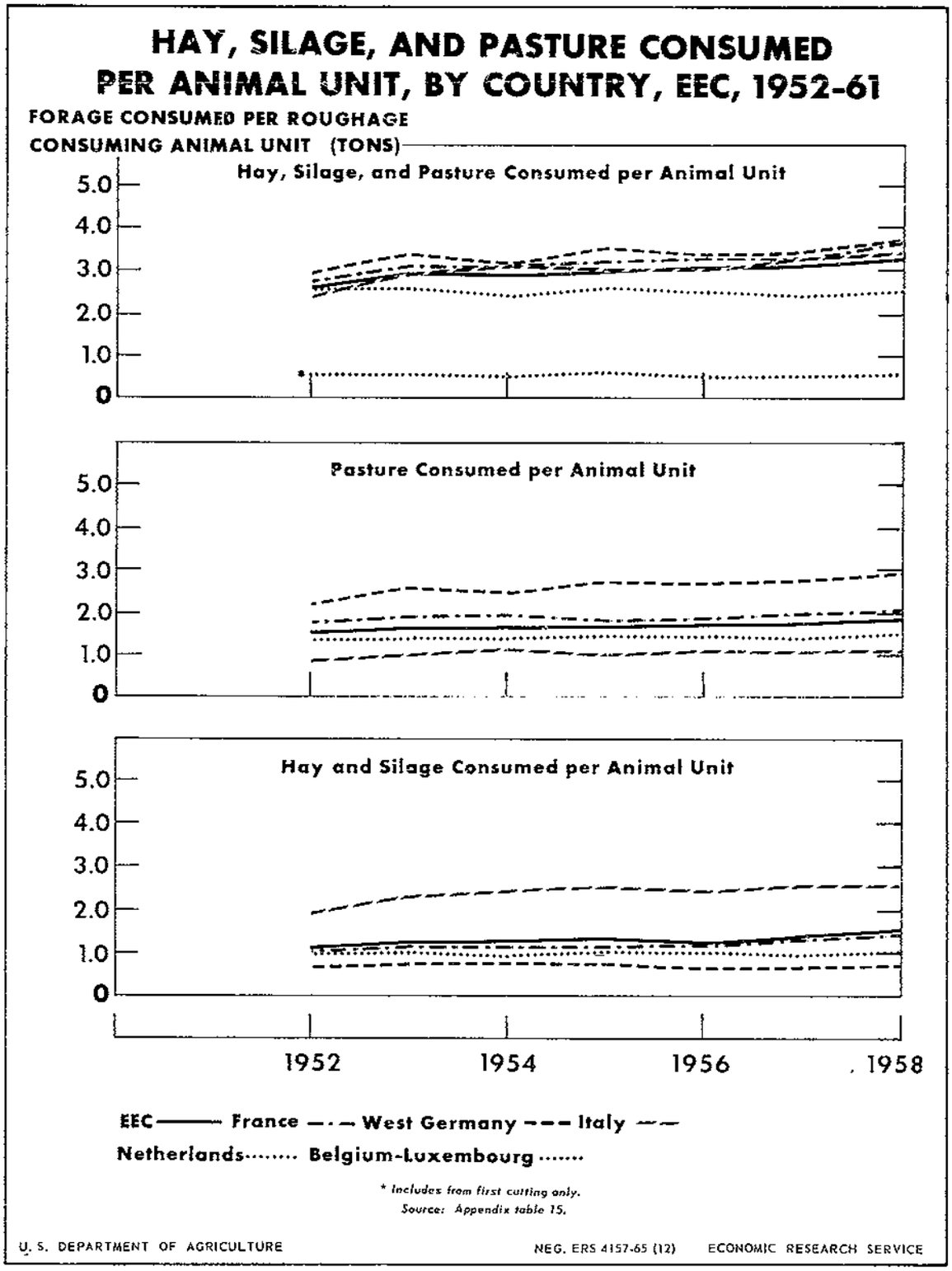
HAY, SILAGE, AND PASTURE CONSUMED PER ANIMAL UNIT, BY COUNTRY, EEC, 1952-61
FORAGE CONSUMED PER ROUGHAGE CONSUMING ANIMAL UNIT (TONS)
Hay, Silage, and Pasture Consumed per Animal Unit
Pasture Consumed per Animal Unit
Hay and Silage Consumed per Animal Unit
5.0
4.0
3.0
2.0
1.0
0
1952
1954
1956
1958
EEC France West Germany Italy
Netherlands Belgium-Luxembourg
* Includes from first cutting only.
Source: Appendix table 15.
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Figure 40

APPENDIX

TABLE 1.--Indices of agricultural production, by country, EEC, 1952-63
(1952/3-1956/7=100)

Year	France	West Germany	Italy	Netherlands	Belgium-Luxembourg	EEC
	Index					
1952-53.....	91	95	92	100	93	93
1954.....	99	101	104	99	96	100
1955.....	104	101	96	100	104	101
1956.....	102	100	105	104	107	103
1957.....	102	102	103	98	100	103
1958.....	102	105	101	105	107	106
1959.....	104	110	116	115	110	112
1959-60.....	112	107	116	117	103	114
1961.....	123	121	108	118	113	122
1962.....	117	109	113	120	113	---
1962-63.....	127	120	118	121	118	---

Sources: OECD, FAO, United Nations, Production Yearbook, 1963, Vol. 17, 1964, Rome. Agriculture and Food Statistics, Statis. Bul., 1962, p. 17, Paris.

TABLE 2.--Indices of industrial output, by country, EEC, 1953-63[1]
(1953-7=100)

Year	France	West Germany	Italy	Netherlands	Belgium-Luxembourg	EEC
	Index					
1953.....	81	86	84	86	88	83
1954.....	89	92	92	95	93	91
1955.....	98	101	100	102	102	101
1956.....	111	108	108	107	108	109
1957.....	120	113	116	109	109	116
1958.....	126	115	120	109	102	119
1959.....	128	116	133	120	107	126
1960.....	140	118	153	135	113	141
1961.....	147	122	170	138	118	151
1962.....	157	123	187	142	126	160
1963.....	164	124	203	152	134	168

[1] For precise definitions, see source. The year of the base weights used to construct these indices varied from country to country. However, all have been adjusted to their respective 1953-57 average index.

Source: OECD, General Statistics, Statis. Bul., Sept. 1964.

TABLE 3.--Indices of general wholesale prices, by country, EEC, 1950-62
(1958=100)

Year	France	West Germany	Italy	Nether-lands	Belgium-Luxembourg	EEC
	Index					
1950.....	65	---	---	93	92	---
1951.....	83	---	---	102	112	---
1952.....	87	---	---	107	105	---
1953.....	83	---	99	95	98	---
1954.....	81	96	98	96	97	---
1955.....	81	97	99	97	99	---
1956.....	85	99	101	99	102	---
1957.....	90	100	102	102	105	---
1958.....	100	100	100	100	100	---
1959.....	105	99	97	101	100	---
1960.....	107	100	98	99	101	---
1961.....	110	102	98	98	101	---
1962.....	113	103	101	99	101	---

Source: FAO, Production Yearbook, 1963, table 179.

TABLE 4.--Price indices for agricultural products, by country, EEC, 1950-62
(1958=100)

Year	France[1]	West Germany	Italy	Netherlands[3]	Belgium-Luxembourg	EEC
	Index					
1950.....	63	---	---	93	100	---
1951.....	73	---	---	102	109	---
1952.....	80	---	---	107	107	---
1953.....	77	86	93	102	104	---
1954.....	76	90	94	103	102	---
1955.....	75	95	96	98	98	---
1956.....	79	98	102	103	101	---
1957.....	83	100	98	103	103	---
1958.....	100	100	100	100	100	---
1959.....	100	103	93	107	99	---
1960.....	102	[2] 99	95	98	96	---
1961.....	104	105	96	98	98	---
1962.....	111	105	105	102	105	---

[1] Includes processed foodstuffs.
[2] Includes Saar since 1960. Also, base adjusted to July 1957-June 1959=100.
[3] Foodstuffs only.

TABLE 5.--Ratio of prices received to prices paid by farmers, by country, EEC, 1950-63

Year	France	West Germany	Italy	Nether-lands	Belgium-Luxembourg
1950	---	---	108	105	98
1951	---	---	102	99	103
1952	---	---	100	97	97
1953	---	---	109	95	93
1954	---	---	113	89	91
1955	---	102	106	89	83
1956	---	102	108	87	82
1957	---	103	119	79	80
1958	---	100	108	75	76
1959	---	101	107	76	79
1960	100	94	110	69	75
1961	100	96	116	67	74
1962	104	95	120	62	72
1963[1]	107	96	---	66	77

[1] Simple average calculated from monthly data.
Source: FAO, Production Yearbook, 1963, table 178.

TABLE 6.--Number of permanent agricultural workers on farms, by country, EEC, 1950, 1955, and 1960

Year	France	West Germany	Italy	Nether-lands	Belgium-Luxembourg	EEC
	Million	Million	Million	Million	Million	Million
Hired workers:						
1950	980	766	1,832	94	36	3,708
1955	894	552	1,517	87	30	3,080
1960	743	331	1,335	78	26	2,512
Family workers:						
1950	4,232	2,838	4,716	382	513	12,681
1955	3,902	2,408	4,401	367	448	11,526
1960	3,328	1,974	3,806	327	336	9,872
Total:						
1950	5,212	3,604	6,548	476	549	16,389
1955	4,796	2,960	5,918	454	478	14,606
1960	4,071	2,305	5,241	405	362	12,384

Source: Agrarstatistik, Statistisches Amt der Europäischen Gemein-schaften No. 1, 1964, Brussels.

TABLE 7.--Number and indices of tractors used on farms, by country, EEC, 1949-53 average, and 1961-62

Year	France	West Germany	Italy	Netherlands	Belgium-Luxembourg	EEC
	Thousands	Thousands	Thousands	Thousands	Thousands	Thousands
1949-53, average.	148.1	165.1	63.7	23.0	13.5	413.4
1961.....	743.4	938.0	272.8	88.9	55.5	2,098.6
1962.....	804.4	999.0	304.9	95.9	60.2	2,264.4
	Index	Index	Index	Index	Index	Index
1949-53, average.	100	100	100	100	100	100
1961.....	502	568	428	386	411	508
1962.....	543	605	479	417	446	548

Source: FAO, Production Yearbook, 1963.

TABLE 8.--Tonnage of fertilizer used on farms, by country, EEC, 1949-53 average, and 1961-63

Year	France	West Germany	Italy	Netherlands	Belgium-Luxembourg	EEC
	1,000 m.t. (N, P_2O_5, K)					
1949-53.....	1,068.0	1,430.8	451.8	413.0	293.0	3,656.6
1961.....	2,192.0	2,275.8	805.3	473.9	358.4	6,105.4
1962.....	2,423.2	2,281.4	844.9	470.1	387.4	6,398.0
1963.....	2,626.5	2,575.2	884.6	519.5	426.2	7,031.0
	Index	Index	Index	Index	Index	Index
1949-53.....	100	100	100	100	100	100
1961.....	205	159	178	115	122	167
1962.....	227	159	187	114	132	175
1963.....	246	180	196	126	145	192
	1,000 m.t. (N)					
1949-53.....	251.7	365.0	145.4	146.2	80.3	---
1961.....	565.1	618.0	322.6	223.6	105.1	---
1962.....	624.7	621.1	347.7	242.9	109.2	---
1963.....	682.8	768.1	375.1	294.0	114.6	---
	1,000 m.t. (P_2O_5)					
1949-53.....	454.2	405.5	282.9	115.6	90.5	---
1961.....	877.4	651.9	378.9	112.1	95.0	---
1962.....	967.9	624.5	369.9	100.9	100.8	---
1963.....	1,034.0	707.0	376.3	101.5	121.1	---
	1,000 m.t. (K_2O)					
1949-53.....	362.1	660.3	23.5	151.2	122.2	---
1961.....	749.9	1,005.9	103.8	138.2	158.3	---
1962.....	830.6	1,035.8	127.3	126.3	177.4	---
1963.....	909.7	1,100.1	133.2	124.0	190.5	---

Source: FAO, Production Yearbook, 1963.

TABLE 9.--Imports and exports of wheat and feed grain in the EEC, 1956-64[1]

Year	Wheat and wheat flour		Feed grains		All grains	
	Imports	Exports	Imports	Exports	Imports	Exports
	Million metric tons					
1956	5,426	3,198	6,925	1,081	12,351	4,279
1957	7,220	1,525	8,031	2,494	15,251	4,019
1958	4,821	4,074	7,627	1,261	12,448	5,335
1959	4,782	2,735	8,460	919	13,242	3,654
1960	4,208	3,117	10,317	1,404	14,525	4,521
1961	6,580	2,491	9,267	2,928	15,847	5,419
1962	6,734	3,189	12,740	3,034	19,438	6,223
1963	3,787	4,138	12,621	2,561	16,408	6,699
1964	5,865	2,820	---	---	---	---

[1] Includes intracommunity trade.

TABLE 10.--Grain fed per grain-consuming animal unit, by country, EEC, 1956-62

Year	France	West Germany	Italy	Netherlands	Belgium-Luxembourg	EEC
	Metric tons					
1956	.2816	.3249	.2194	.3764	.3827	.2958
1957	.3111	.3373	.2460	.4360	.4431	.3244
1958	.2889	.3371	.2734	.4065	.4397	.3187
1959	.2857	.3278	.2900	.4175	.4247	.3180
1960	.3118	.3446	.3153	.3974	.4349	.3397
1961	.2965	.3280	.3349	.4423	.3895	.3315
1962	.3030	.3380	.3460	.4000	.3670	.3430

TABLE 11.--Number of grain-consuming animal units, by country, EEC, 1956-62

Year	France	West Germany	Italy	Netherlands	Belgium-Luxembourg	EEC
	Thousand units					
1956	33,480	25,142	16,790	7,352	4,944	87,708
1957	33,835	26,164	16,919	7,578	5,008	89,504
1958	34,347	26,924	17,013	7,744	5,110	91,138
1959	35,664	26,871	17,426	8,166	5,256	93,383
1960	35,849	27,700	18,403	9,098	5,355	96,405
1961	37,584	29,126	18,588	9,321	5,594	100,213
1962	37,922	30,160	18,779	9,477	5,718	102,056

Source: Numbers developed by ERS from livestock inventory numbers and slaughter numbers published in Agrarstatistik, No. 3, EEC, 1962, Brussels. The conversion factors used were adopted from Jennings, R. D., Consumption of Feed by Livestock, 1909-56, PRR 21, Nov. 1958. The conversion factors are: 1 horse = 1.300; 1 milk cow = 1.020; 1 cattle under 2 yrs. = .344; 1 other cattle = .167; 1 sheep or goat = .120; 1 chicken = .0577; 1 hog for slaughter = .712; and 1 broiler = .008.

TABLE 12.--Grain fed to livestock, by country, EEC, 1956-63[1]

Year	France	West Germany	Italy	Netherlands	Belgium-Luxembourg	EEC
	Million metric tons					
1956	9.43	8.17	3.68	2.77	1.89	25.94
1957	10.53	8.83	4.16	3.30	2.22	29.04
1958	9.92	9.08	4.65	3.15	2.25	29.05
1959	10.19	8.81	5.05	3.41	2.23	29.69
1960	11.18	9.82	5.80	3.62	2.33	32.75
1961	11.14	9.55	6.23	4.12	2.18	33.22
1962	11.50	10.20	6.50	3.80	2.10	34.30
1963	13.80	10.30	7.30	3.50	1.70	36.80

[1] Includes all grains except rice.

Source: Agrarstatistik, 1963-No. 3; 1962-No. 2; and 1961-No. 3, EEC, Brussels.

TABLE 13.--Per capita food grain consumption, by country, EEC, 1956-62

Year	France	West Germany	Italy	Netherlands	Belgium-Luxembourg	EEC
	Kilograms (per capita)					
1956	135	120	175	115	135	140
1957	125	115	175	115	125	135
1958	130	115	170	115	125	135
1959	135	110	175	110	120	135
1960	130	105	170	105	120	130
1961	135	100	170	100	125	130
1962	130	95	175	105	120	130

Source: Statis. Bul. 351.

TABLE 14.--Number of forage-consuming animal units, by country, EEC, 1952-62

Year	France	West Germany	Italy	Netherlands	Belgium-Luxembourg	EEC
	Thousands					
1952	18,408	12,150	11,650	2,826	2,286	47,320
1953	18,973	12,016	11,369	2,898	2,373	47,629
1954	19,325	11,763	11,068	2,972	2,399	47,527
1955	19,554	11,665	10,705	2,924	2,402	47,250
1956	19,633	11,782	10,625	2,896	2,407	47,343
1957	19,798	11,805	10,755	3,013	2,457	47,828
1958	20,225	11,824	10,989	3,100	2,550	48,688
1959	20,410	12,012	11,234	3,256	2,623	49,535
1960	21,024	12,243	11,565	3,333	2,665	50,830
1961	21,825	12,506	11,307	3,418	2,686	51,742
1962	21,538	12,495	11,349	3,586	2,774	51,742

TABLE 15.--Hay, silage, and pasture consumed per animal unit, by country, EEC, 1952-58

Year	France	West Germany	Italy	Netherlands	Belgium-Luxembourg	EEC
	Metric tons					
Total consumption in:						
1952.....	2.78	2.91	2.48	2.63	.60	2.63
1953.....	3.07	3.34	3.01	2.60	.59	2.97
1954.....	3.03	3.17	3.15	2.47	.52	2.93
1955.....	2.84	3.51	3.22	2.63	.63	2.96
1956.....	3.06	3.35	3.21	2.53	.53	3.01
1957.....	3.30	3.40	3.29	2.44	.56	3.13
1958.....	3.62	3.69	3.32	2.56	.58	3.34
Hay and silage consumption in:						
1952.....	1.04	.67	1.90	1.05	.26	1.12
1953.....	1.17	.75	2.35	1.04	.26	1.29
1954.....	1.17	.71	2.42	.99	.28	1.29
1955.....	1.11	.77	2.53	1.05	.30	1.30
1956.....	1.19	.67	2.49	1.01	.25	1.29
1957.....	1.32	.69	2.59	.98	.27	1.38
1958.....	1.54	.73	2.60	1.02	.26	1.48
Pasture consumption in:						
1952.....	1.74	2.24	.57	1.58	.33	1.50
1953.....	1.90	2.59	.65	1.56	.32	1.68
1954.....	1.86	2.46	.73	1.48	.24	1.64
1955.....	1.73	2.74	.69	1.58	.33	1.66
1956.....	1.87	2.69	.72	1.52	.28	1.72
1957.....	1.97	2.71	.70	1.47	.29	1.75
1958.....	2.08	2.96	.72	1.53	.32	1.86

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