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MEAT CONSUMPTION TRENDS AND PATTERNS

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U.S. DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service
Agricultural Economics Division
Washington, D.C.

Agriculture Handbook No. 187

PREFACE

This bulletin represents the joint effort of several economists in the Consumption Section of the Agricultural Marketing Service, with the aid of AMS livestock and meat specialists. Primary responsibility for drafting the body of the report was Gertrude Gronbech's. She received technical assistance from Thomas J. Lanahan, Jr., who in turn worked in cooperation with Marguerite C. Burk in writing the technical appendixes. In planning and preparing the bulletin, the authors benefited from suggestions made by marketing personnel of the Federal and State Extension Services, whose assistance they desire to acknowledge.

July 1960

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CONTENTS

	Page
Summary	1
Section I. Trends in meat consumption	3
Trends for kinds of meat	3
Increases in demand for meat	4
Supply factors related to meat consumption	5
Meat produced for home use	7
Changes in retail prices	8
Trends in retail value	8
Section II. Variations in household meat consumption	10
Possible effects of timing of 1955 survey on these variations	11
Influence of distribution of population on averages	12
Variations in consumption of all meat	12
Variations in consumption of kinds of meat	15
Influence of home production on variations in consumption	19
Variations in the value of meat consumed	20
Section III. Regional structure of the U. S. market for meat	22
The market for all meat	22
The market for each kind of meat	23
Comparison of regional shares of production and of the market	24
Section IV. Meat consumption outside households	27
Kinds and cuts of meat	28
Special marketing services	28
Section V. Implications for future meat consumption	29
Changes in consumption patterns	29
Summary of projected economic framework for 1975 to 1980	30
Projections of food and meat consumption	31
Indications of further changes in meat purchases and marketing	31
Tables	34
Appendix A. Data on meat consumption	44
Appendix B. Information on prices, income, expenditures, and population	50
Appendix C. Use of meat consumption data in analyses	53
Bibliography	56

GUIDE TO FIGURES AND TABLES

Figure No.	Title	Page
1	Meat consumed per capita	4
2	Beef and pork production and population	6
3	Meat and all retail prices	9
4	Regions used in survey (United States)	11
5	Distribution of household population by urbanization, spring 1955	13
6	Meat consumed in U. S. households grouped by income, week of spring 1955	14
7	Kinds of meat consumed, spring 1955	15
8	Regional differences in beef consumed at home (per person)	16
9	Regional differences in pork consumed at home (per person)	17
10	Pork and beef consumed in U. S. households grouped by income, week of spring 1955	18
11	Regional differences in value of meat consumed at home (per person)	20
12	Regional shares of housekeeping population and household expenditures for meat, spring 1955	23
13	Regional shares of animals marketed, meat produced and purchased, 1955	25

Table No.		
1	Per capita meat consumption, by kinds, and population, 1909-58	34
2	Quantity of meat used per person, by region, urbanization, and income, spring 1955	35
3	Quantity of beef used per person, by region, urbanization, and income, spring 1955	36
4	Quantity of pork used per person, by region, urbanization, and income, spring 1955	37
5	Retail value of all meat, beef, and pork used per person and percentage of the United States average, by region and urbanization, spring 1955	38
6	Retail value of all meat, beef, and pork used per person, by urbanization and income, spring 1955	39
7	Quantity of all meat, beef, and pork purchased per person in farm households, by region and income, spring 1955	40
8	Distribution of households and of members of housekeeping families, by region and urbanization, spring 1955	41
9	Distribution of households and of members of housekeeping families, by region and income, spring 1955	42
10	Distribution of members of housekeeping families in first quarter 1942 and spring 1955, by urbanization and income	43

MEAT CONSUMPTION TRENDS AND PATTERNS

Consumption Section
Statistical and Historical Research Branch
Agricultural Economics Division

SUMMARY

Major research findings on meat consumption in the United States already published are summarized in this report for use by Extension personnel, market researchers in the food industries, and others concerned with market development.

Covered in the five sections of this report are: (1) Description of historical trends in meat consumption and related economic changes; (2) variations in household meat consumption by region, urbanization, and income as revealed by special surveys; (3) analysis of the regional structure of the U. S. market for meat based on household survey data; (4) some information on meat consumption outside private homes; (5) implications for future changes in meat consumption. Tables and appendixes provide data and technical information for further analysis.

As background, here are some indications of the importance of meat for agriculture, the food marketing industry, and consumers. Almost a third of the total cash receipts from farming comes from the sale of meat animals. The meat packing industry is one of the major food manufacturing industries, ranking second only to bakeries in the number of employees and third in the value added by manufacture.

For the consumer, meat ranks high as a food in terms of expenditures, consumer preferences, and nutritive content. A fourth of the money households spend for food to be used at home is for meat. In addition, some households produce meat for their own use, amounting to a fifth of the value of all home-produced food. Very little information is available on the use of meat other than in households. However, expenditures for meat by people living in institutions as well as for meals in restaurants, in-plant feeding, and other such meals away from home undoubtedly represent a significant part of the total food bill.

Per capita consumption of meat today is about the same as it was 50 years ago, but is much higher than in the mid-1930's. Meat consumption has increased since the 1930's concurrently with rising consumption of dairy products, eggs, poultry, and processed fruits and vegetables. Greater purchasing power has resulted in increased meat buying. Meat supplies during the past quarter century have increased faster than population.

Certain rigidities in the livestock industry lead to cyclical patterns of supply around the general trend. The pork production cycle is about 4 years in length. The cattle cycle has shortened somewhat in the last half century; it now runs about 9 or 10 years. These cycles materially affect supplies of meat for civilian consumption.

Future advances in technology that result in reduced perishability of meat could cause cyclical and seasonal fluctuations in supply to be reduced by changes in stocks. The flow of meat into distribution would follow more closely the somewhat steadier trend in consumer demand for meat.

Variations in the consumption of meat are greater among regions of the country than among urbanization categories -- urban, rural nonfarm, and farm. But per person averages of meat consumption differ still more among households grouped by income than among either regions or urbanizations. Urban and farm households used about the same amount of meat per person in spring 1955 in the 3 regions outside the South. Meat purchases vary much more among urbanization categories than do meat consumption rates. The effect of home-produced supplies on rural purchases is reflected here.

The influence of level of family income on meat consumption is not the same for each kind of meat; it is less for pork than for other meats. But even in the case of pork, family income strongly influences choice of cuts.

Among regions, the range in the values of meat used per person in spring 1955 was greater than was the range in quantities used. The South consumed less meat per person and used less expensive meat. Meat used per person in households grouped by income also differed more in value than in quantity used.

Relative to the size of population, the Northeast and the West constitute the two largest markets for meat for household consumption, and the South, on this same basis, the smallest market. In terms of expenditures, the Northeast has a smaller share of the market for pork and a much larger share for veal, lamb and mutton than for beef or for all meat. Unlike the other regions, the South's share of the market for pork is much larger than its share of the market for other meats.

In the Northeast, about three times as much of each kind of meat is bought as produced. The South imports pork and also hogs for slaughter to supply more than half its demand for pork.

No comprehensive information on meat consumption outside private homes is available, though it is known that about 18 percent of the food sold to U. S. civilians is handled by eating places. We do not know how much of this total is meat or any other commodity.

A recent set of projections of per capita utilization of farm commodities, from 1954 to 1980, includes an 11 percent increase per capita for all farm foods, 12 percent for food use of livestock products, and 16 percent for meat animals. Increases in per capita purchases of food and of meat products are likely to be somewhat greater than the projected increase for food from all sources, including home-produced supplies. Greater pressure of demand on beef than on pork supplies is expected. Stronger demand for higher grades and better cuts might lead to a greater price spread among cuts and grades of meat. This is likely to encourage further improvement of livestock.

SECTION I. TRENDS IN MEAT CONSUMPTION

This section deals with historical trends in average quantity, retail prices, and retail value of meat consumed, and relates them to major changes in meat supplies and consumer demand.

Consumption of meat per capita is about the same now as 50 years ago, but much higher than in the mid-1930's (fig. 1). 1/ The general trend in average consumption was downward from about 1910 until the 1930's. In 1935 consumption fell to the lowest point on record, 117 pounds per person (carcass weight), the result of drought and emergency slaughter in preceding years. After 1935 the trend was upward. The highest rate since 1908 was set in 1956 -- 167 pounds. Following 1956, cyclical swings in meat production reduced average consumption, but it increased again in 1959.

Along with an increase in meat consumption since the mid-1930's came the rise in per capita consumption of other livestock products -- dairy products, eggs, poultry -- and of processed fruits and vegetables. In contrast, consumption of fresh fruits and vegetables, potatoes, sweetpotatoes, and cereal products has decreased, particularly after World War II.

Trends for Kinds of Meat

In general, per capita consumption of both beef and pork decreased from the early 1900's to the mid-1930's, then began to increase. However, beef and pork consumption often fluctuated from the genral trend in opposite directions. In the 1950's the trend in pork consumption was downward, that of beef upward.

Per capita consumption of pork today is about the same as it was 50 years ago. It dropped sharply after the severe drought and reduction in hog numbers of the mid-1930's, then increased, reaching high levels during World II and the postwar years. Since 1946 the general trend has been downward, but recently supply, and therefore consumption, started to increase again.

1/ Historical data on annual consumption are given in table 1. (Tables begin on page 34.) Additional information may be found in Agr. Handb. 62 Consumption of Food in the United States, 1909-52 (3),* table 8, carcass weight; table 28, retail weight; and table 54, supply and distribution data, including production and foreign trade, Statis. Bul. 230 Livestock and Meat Statistics 1957 (7), and Vol. 5 of Agr. Handb. 118 Consumption and Utilization of Agricultural Products (17). National Food Situation (10) and Livestock and Meat Situation (6) regularly report current meat consumption data.

* Numbers in parentheses refer to citations in the Bibliography, which provides detailed references.

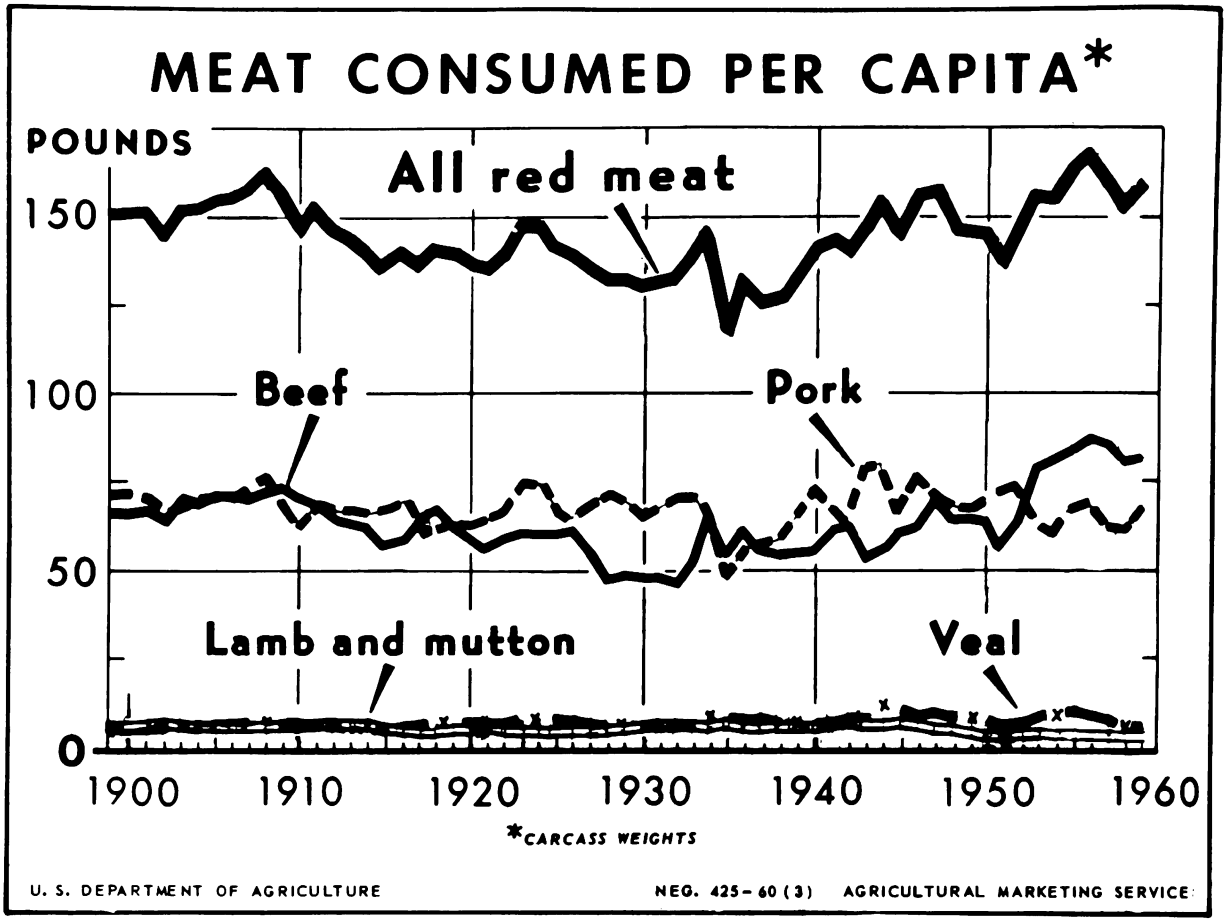

Figure 1

In contrast to the rate of use of pork, per capita consumption of beef increased sharply in the mid-1950's. The consumption rate for beef has recently leveled off to a point slightly above that of 50 years ago, but there are some indications that it may climb again in the 1960's.

Average consumption of veal and lamb and mutton, which are much less important in the total meat picture than beef or pork, increased from the 1930's through World War II, then decreased. Veal consumption experienced somewhat more of a comeback in the mid-1950's, but dropped sharply during the last few years. The supply of veal from dairy calves has fallen as the number of milk cows has declined.

Increases in Demand for Meat

The increase in per capita consumption of meat since the 1930's occurred during a period of increasing employment and rising incomes. Greater purchasing power encouraged increased purchases of meat, and meat supplies rose faster than population grew.

Demand for meat has risen concurrently with increased consumption of such meat substitutes as poultry, eggs, and cheese. Increased demand for meat has been reflected not only in the average number of pounds consumed per capita,

but also in stronger demand for better quality and in higher prices paid, especially for beef.

After 1935, feeding of grains increased, and production of the higher grades of beef gained in importance. Contributing to upgrading the beef supply was the decline in the relative number, and since World War II in the actual number, of dairy cows. This reduced the proportion of steers from dairy herds and increased the share of beef type, which grade higher than dairy animals. In the late 1920's less than a third of beef production was fed beef, which supplies most of the higher grades. By the end of World War II the top three grades -- Prime, Choice, and Good -- amounted to half of the beef supply. For 1956 the proportion was 58 percent.

Increased demand for higher grades by retailers as well as consumers has been encouraged by several developments. Large-scale buyers such as chain stores can now order by grade specification more easily than they can by inspection, the prevailing practice in the past. Retail stores favor higher grades of beef in order to capitalize on the established reputation of the higher U. S. grades and to avoid occasional complaints about toughness, more likely to occur in the case of lower grades. Retail stores also appreciate that in the self-service meat counters, which are increasing in use, better grades maintain their appearance for a longer period of time than the lower grades do. People are also eating away from home more often than formerly, and this has probably contributed to increases in demand for higher grades of beef. 2/

Supply Factors Related to Meat Consumption

Since meat is perishable and imports and exports are relatively small, each year's civilian consumption is roughly equal to current domestic production minus procurement for the Armed Forces. Imports seldom provide a sizable addition to supply.

Several developments that have facilitated the increase in meat production are: Technological and organizational improvements in production of feed, meat animals, and meats; demand for related livestock products such as dairy products and wool; improvements in marketing; and technological changes in freezing facilities.

How producers respond to demand depends in part on feed supplies and livestock prices, current and expected. But as they respond to demand, certain rigidities in the livestock industry lead to a cyclical pattern of supply around

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2/ For further discussion of grades see Williams, Willard F. and others, Economic Effects of U. S. Grades for Beef (112) and an address by John C. Pierce, "Beef Grades and Standards -- Past and Present" (96).

the general trend. Short-term fluctuations in supply occur within cyclical patterns for both beef and pork. 3/ Supplies depend on the stage in the cycle, whether in the expanding or declining phase (fig. 2).

Certain characteristics of the livestock industry affect the timing and degree of changes in supply in response to changes in demand. Hog production shifts with the price of feed relative to the expected price for hogs. Although it is less so now than some years ago, the demand and supply situation for fat still has some influence on hog production. Since it is relatively easy for farmers to expand or contract the number of hogs raised, market conditions affect production relatively quickly. Year to year variations in corn production have less effect on pork supply than formerly, as corn is now available from Government surplus stocks. Pork supply follows closely the number of pigs saved, with a 7- to 9-month lag. The pork production cycle is about 4 years in length.

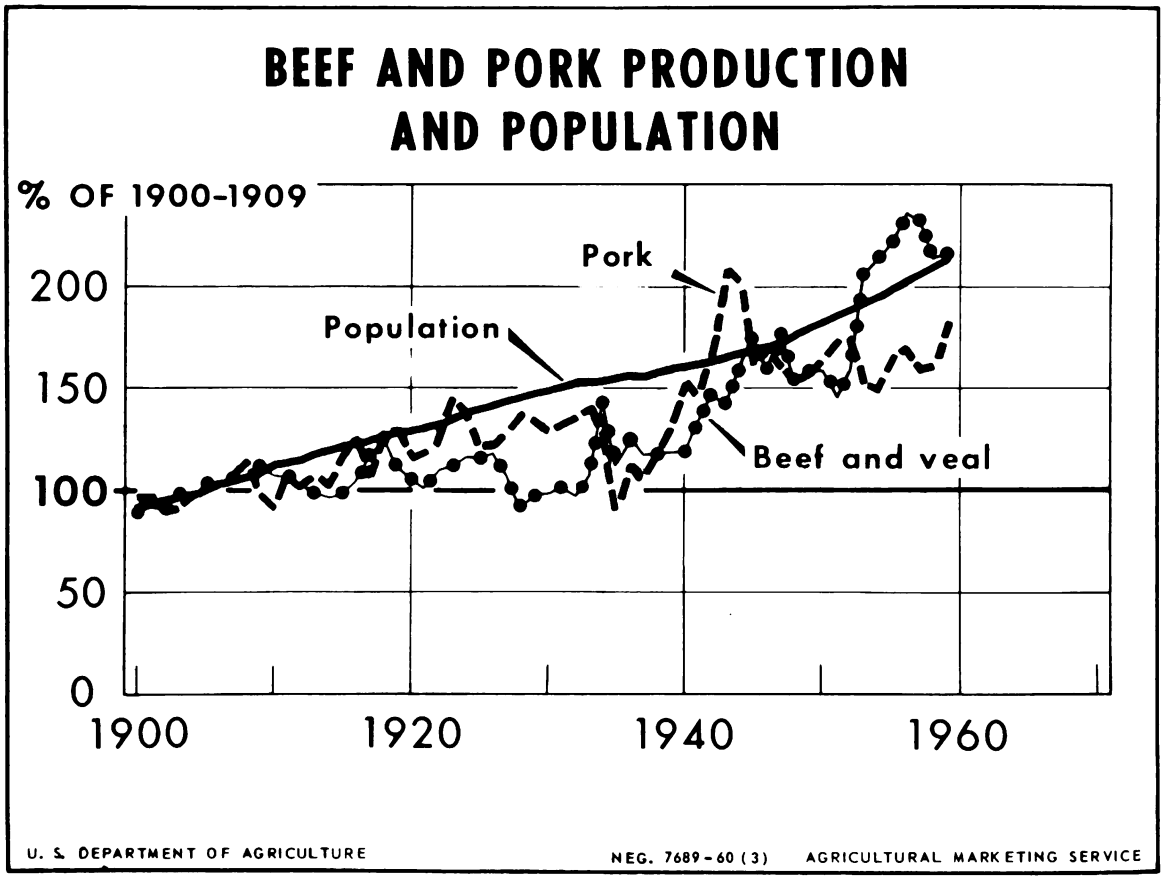

Figure 2

3/ Breimyer, Harold F. "Problems and Probable Trends in Adjusting Livestock Production to Changes in Food Habits" (40), "Emerging Phenomenon: A Cycle in Hogs" (70), and "Observations on the Cattle Cycle"(74). See also pp. 4-10 of "Review and Outlook," Livestock and Meat Situation, Aug. 1958 (108).

In the cattle industry, high investment per head and the long life span and single births of cattle make a longer range outlook more important for cattlemen than for most farmers. Furthermore, many cattlemen have few or no alternative enterprises to which they can shift. However, they do have some leeway with regard to the time of selling cattle for slaughter or further feeding -- from the weaning of a calf up to a year or more later. Another factor in beef and veal production is the demand and supply situation for dairy products, which influences production of cow beef and veal from dairy herds. In short, these characteristics of the cattle industry lead to relatively slow changes in supply, with prices tending to move inversely to supply.

Supplies of beef and veal are subject to a longer cyclical pattern than pork. The cattle supply cycle now runs 9 or 10 years in length. It is shorter than it was earlier in the century, and there are signs that it may be still further reduced. Slaughter for consumption follows a pattern similar to the cattle supply cycle, but with a few years' lag. Slaughter tends to show wider variations than number of cattle on hand, since slaughter is curtailed while herds are being expanded and increases sharply when herds are being reduced.

The sheep industry is undergoing some changes that are causing supplies to decrease. Large range flocks in the West are decreasing in number, because farmers are shifting from sheep to cattle raising, since cattle require less labor. However, the number of farm flocks in other regions in recent years has increased, thus offsetting somewhat the drop in supplies from the West. The increase has been feasible through improved control of disease and insects. Farm flocks make use of land and feed not otherwise utilized by farm operations in these areas. The supply and demand situation for wool influences lamb and mutton supply to some extent, though not as much as in the past. Short-run changes in the sheep industry are fairly easy to make; hence relatively fast changes in supply are possible, though not as fast as with hogs.

Supplies of lamb and mutton have varied a great deal in the past but not in a clear-cut cyclical pattern.

Meat Produced for Home Use

Not all meat comes from commercial supply. As farmers produce much meat for their own use, the decrease in the number of farmers has resulted in less total production of meat for home use. However, the average quantity of home-produced meat per person living on farms is greater now than 20 years ago. This is due to increased use of beef, and this in turn has been related to greater availability of freezing facilities in recent years. Home production of pork dropped, especially after World War II, but it still exceeds the quantity of beef home produced.

Changes in Retail Prices

Retail prices of meat move up or down as supplies become plentiful or scarce in relation to demand. Population growth, together with higher purchasing power, has caused a gradual increase in total demand for meat. Producers have tended to respond to this upward trend, but supplies have not consistently matched the gradual increase in demand. When production rises more rapidly than demand, prices must drop to move supplies. When meat production does not keep pace with demand, prices rise. Thus, price changes reflect changes in supplies relative to strength of demand.

Although the per capita supply of meat increased after the 1930's, demand was strong enough to raise retail prices of meat even faster than the general price level. By the mid-1950's per capita supplies were the highest since 1908, and meat prices declined sharply, while the general price level was holding fairly constant (fig. 3). 4/ After 1956 when supplies declined, meat prices advanced faster than the general price level, reaching a peak early in 1958.

Prices of beef and pork followed about the same upward trend during the 1940's. Since then demand for beef has been strong enough to raise beef prices more than pork prices, even with a decrease in supply of pork and an increase in the supply of beef.

Trends in Retail Value

The retail value of all meat consumed is estimated by valuing the average quantity of meat at average retail store prices. 5/ Thus, the trend in the retail value depends on changes in both quantity consumed and retail prices, which may be in the same or opposite directions, either at different rates of change or at the same rate.

From the mid-1930's to the late 1940's the retail value of meat per capita was increasing both in current dollars and in constant (1947-49) dollars. The per capita consumption of meat increased steadily, pork going up at an earlier stage in the period and beef at a later stage. Measured in

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4/ Data for 1947-58 reported in Agricultural Outlook Charts 1959 (18, p. 81). Current data on retail price index for meat given in Livestock and Meat Situation (6) and on the Consumer Price Index and retail price indexes for food groups in National Food Situation (10). The retail price index data for meat beginning in 1935 are given in Bur. Labor Statis. Bul. 1254, Retail Prices of Food 1957-58, table 3 (15).

5/ Data given in Livestock and Meat Situation, July 1959 (11, p. 27). See Appendix A for related information.

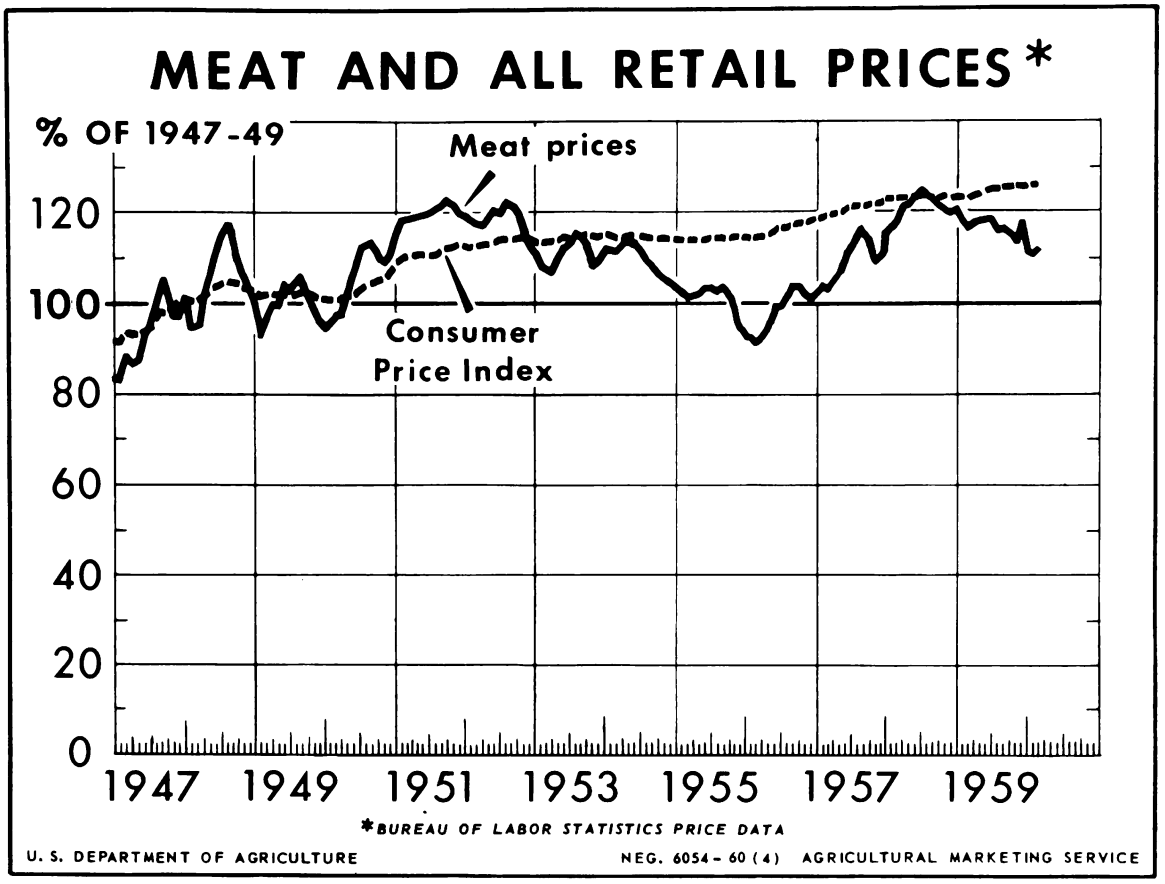

Figure 3

1947-49 dollars, retail prices rose very rapidly after July 1946. The sharpest increase in per capita retail value of meat in both current and constant dollars during this period was in 1946-47 after removal of price controls, when both the quantity of meat consumed and relative retail prices of meat increased.

During the 1950's the trend in per capita retail value of meat in constant dollars leveled off. Although consumption of beef increased, this has been offset in the total retail value of meat, not only by reduced consumption of pork but also by declines in the prices of both beef and pork relative to the general retail price level.

Increases in the retail value of meat per capita have been at a slower rate than the rise in disposable income per capita since the late 1930's, except immediately after World War II.

SECTION II. VARIATIONS IN HOUSEHOLD MEAT CONSUMPTION

This section summarizes major types of information about variations in meat consumption at home among private households. Information from a survey of household food consumption can provide a cross-section view of how meat consumption varies among population groups in a selected time period. One set of such cross-section data -- or, preferably, several sets -- can be related to national averages to study reasons for past trends in consumption, to describe the structure of the U. S. market for meat at certain times, and to develop ideas about future changes in national averages and in patterns of consumption for areas within the country. 6/

One such cross-section view is supplied by data from the Survey of Household Food Consumption in the spring of 1955. Reports from this survey contain household average quantities and values for individual items consumed in a week of spring by households grouped according to region, degree of urbanization (urban, rural nonfarm, or farm), and family income level. 7/ Per person averages have been calculated from the published household data. 8/

These variations in meat consumption provide a basis for studying relationships between (1) average consumption of selected population groups and (2) certain characteristics of these groups, such as income level, urbanization, and region. The observed patterns of meat consumption yield clues to the probable influence of these economic and social factors on overall averages for meat consumption and, therefore, on trends in meat consumption. Other social and economic factors affecting consumption rates, but not separately measurable with consumption data now available, include family composition, occupation, national origin, and past levels of income and consumption. Also, refrigeration facilities in households and supplies of meat available in accessible markets have a bearing on the kind and quantity of meat used.

6/ Technical aspects of how closely averages computed from the survey data match the national averages derived from disappearance data are discussed in Burk, Marguerite C. and Lanahan, Thomas J.,Jr. "Use of 1955 Food Survey Data for Research in Agricultural Economics," Agr. Econ. Res., July 1958(48 pp.89-90).

7/ Basic quantity and value data for individual commodities published in Survey Reports 1-5 (33). Figure 4 delineates the regions. Urban households lived in communities of 2500 population or more and in suburbs of large cities. Rural nonfarm households lived outside urban areas but were not operating farms. Farm households included only those operating farms.

8/ Information for this section developed from Breimyer, Harold F. and Kause, Charlotte A. Consumption Patterns for Meat, AMS-249 (41), and Lanahan, Thomas J., Jr. "A Review of 1955 Survey Data on Household Meat Consumption," National Food Situation, Apr. 1957 (57). Tables 2-7 contain most of the per person data used here. Technical notes describing their derivation and giving guidance for further study are provided in Appendixes A and C.

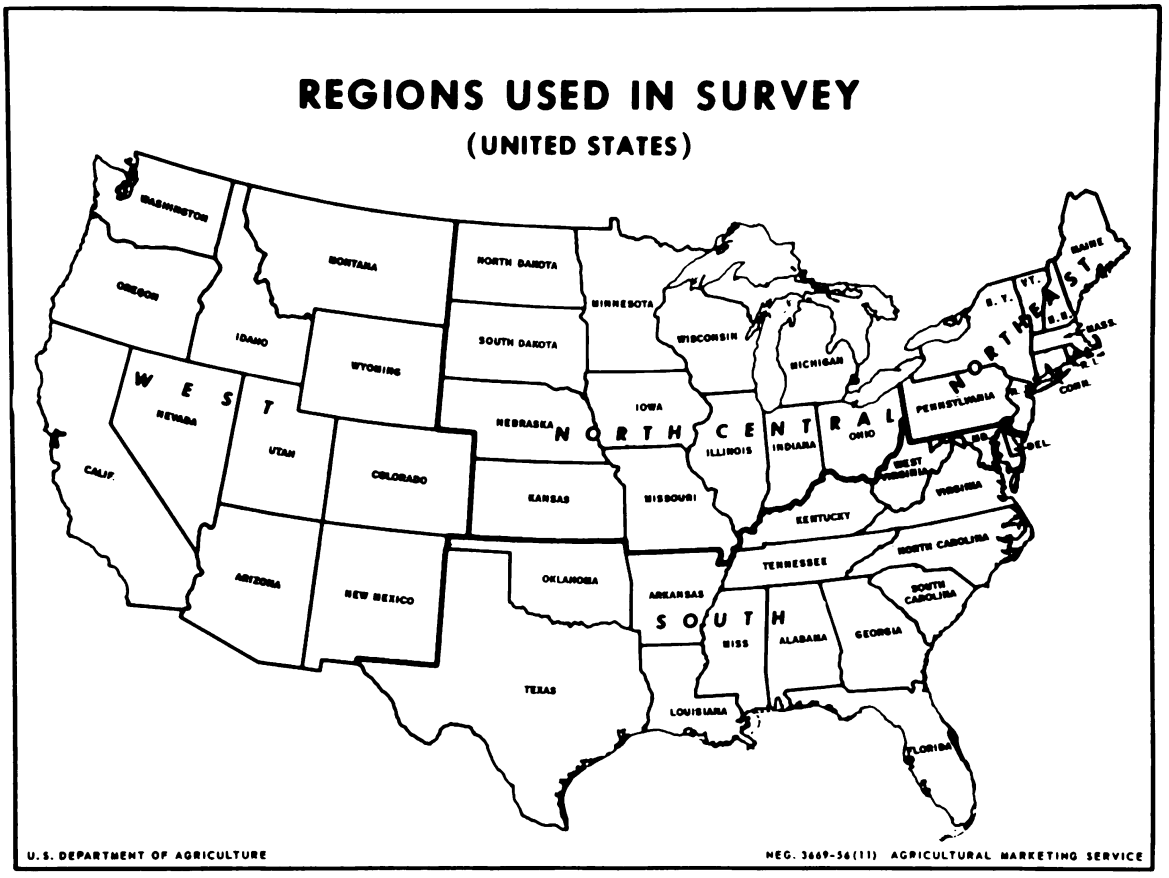

Figure 4

Possible Effects of Timing of 1955 Survey on These Variations

Before beginning a review of how meat consumption varied in the spring of 1955, we must consider briefly how the timing of that survey could have influenced the observed variations. First, there is the matter of seasonality. From a review of data on seasonal variations in meat purchases of city households in 1948 and from data on apparent total civilian consumption of meats by month, it appears that household meat consumption in the spring, generally, and in the spring of 1955, in particular, was representative of the annual rate. 9/

9/ Food Consumption of Urban Families in the United States (spring 1948), Agr. Inf. Bul. 132 (28, p. 102); Seasonal Patterns of Food Consumption, City Families, 1948, Spec. Rept. 3, Food Consumption Surveys of 1948-49 (29, p. 4); "Consumption of Commercially-Produced Meats by Months," Livestock and Meat Situation, Aug. 1956 (54, pp. 29-44); Charting the Seasonal Market for Meat Animals, Agr. Handb. 83 (77, p. 32).

Next, there is the question of how far we can generalize from these 1955 data in describing consumption patterns of recent years and in projecting changes for the next few years. Most economists agree that food consumption patterns change quite slowly. At the time of the household food consumption survey in the spring of 1955, civilian consumption of meat per capita was still increasing cyclically and was about 5 percent above the average for the 1950's. Meat supplies were plentiful, somewhat outrunning consumer demand, even though demand was relatively strong. Retail meat prices were in the later stages of a decline that had begun in September 1952 and continued until the spring of 1956. In view of current expectations of a comparable meat supply and demand situation in the 1960's, relationships derived from the 1955 survey seem to provide a satisfactory operating basis for analysis of meat consumption changes of this period.

Influence of Distribution of Population on Averages

Overall average consumption depends on both the per person averages for subgroups within the total population and the proportion of the total population falling within each subgroup. Statistics on the proportions of the U. S. housekeeping population in each region, urbanization, and income category are given in tables 8 and 9. Figure 5 highlights the variations in relative importance of each urbanization from region to region.

Three examples indicate the importance of these population distributions to any study of variations in meat consumption. Households with higher incomes use more meat per person than those in lower income groups, so the proportion of the population in each of the income groups is significant in the average consumption of an entire urbanization or region. The most striking variation by urbanization is the purchase by nonfarm households of practically all the meat they use, whereas farm households buy only about half of the quantity they use. Average quantity of meat purchased per person by the population as a whole is much closer to that of the nonfarm than of the farm group since nonfarm greatly outnumbers farm population. National averages are also affected by regional distribution of the population. Average U. S. farm meat consumption per person reflects the fact that almost half the farm population lives in the South where farm meat consumption is much less per person than in the other regions.

Variations in Consumption of All Meat

Variations among urbanization categories in the consumption of meat are less than variations among regions. But the range of per person averages among households grouped by income is greater than the differences among either regions or urbanizations. 10/

10/ Data given in table 2.

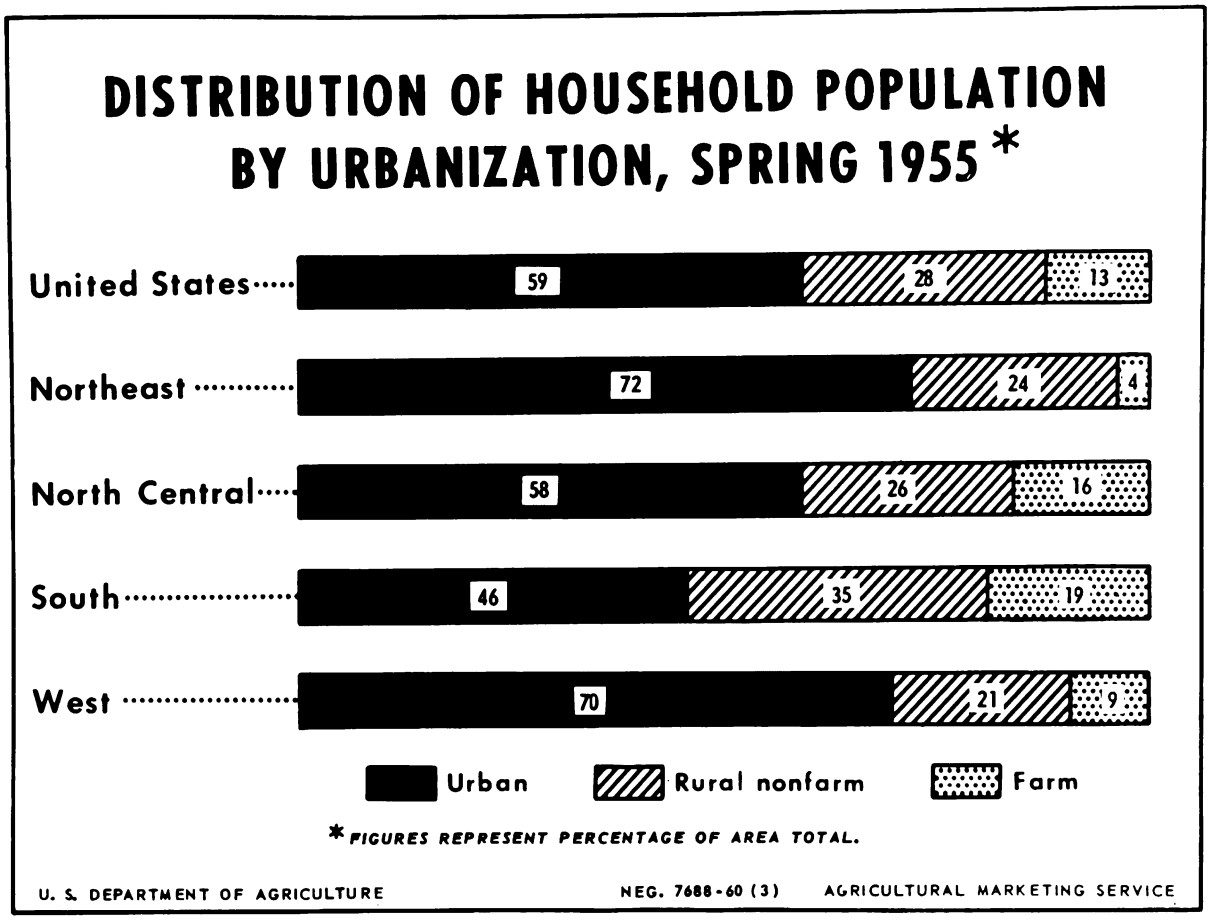

Figure 5

Regional Variations.- In 1955 the North Central Region and the West used about 10 percent more meat per person than the average for the country as a whole. The South used about 15 percent less. The average for the Northeast was about the same as that for the United States.

The low average for the South reflects a relatively large proportion of low-income people and, generally, a lower level of meat consumption per person across the whole range of incomes. The latter is influenced by (1) the larger average sizes of family, (2) relatively low supplies of meat from home production and in commercial markets in recent decades, (3) shortage of refrigeration facilities relative to needs now and in the past, and (4) lags in adjustment of rates of meat consumption to recent increases in income, in urbanization, and in meat supplies.

Variations Among Urbanization Groups.- Urban and farm households used about the same quantity of meat per person in each region, except the South. In the South, urban consumption averaged a third larger than that of the farm population. Since the South has almost half of the farm population, lower meat consumption on southern farms made the U. S. farm average lower than the

urban average. The much lower consumption rate among southern rural households than among urban ones stems from two factors. One is the generally smaller quantity of meat used per person at the several income levels by both farm and rural nonfarm households, the difference being greater among the lower income groups. Second, a much higher proportion of the rural population is in the lower income groups, which use less meat per person.

In the amount of meat purchased per person, there is more difference between the farm and nonfarm population, since home-produced meat amounts to about half the meat used in farm households. In the spring of 1955, the rural nonfarm group bought almost twice as much meat, and the urban more than twice as much, per person as the farm group.

Southern farm households bought less meat per person and also used less home-produced meat than those in the other major farm area -- the North Central Region. 11/

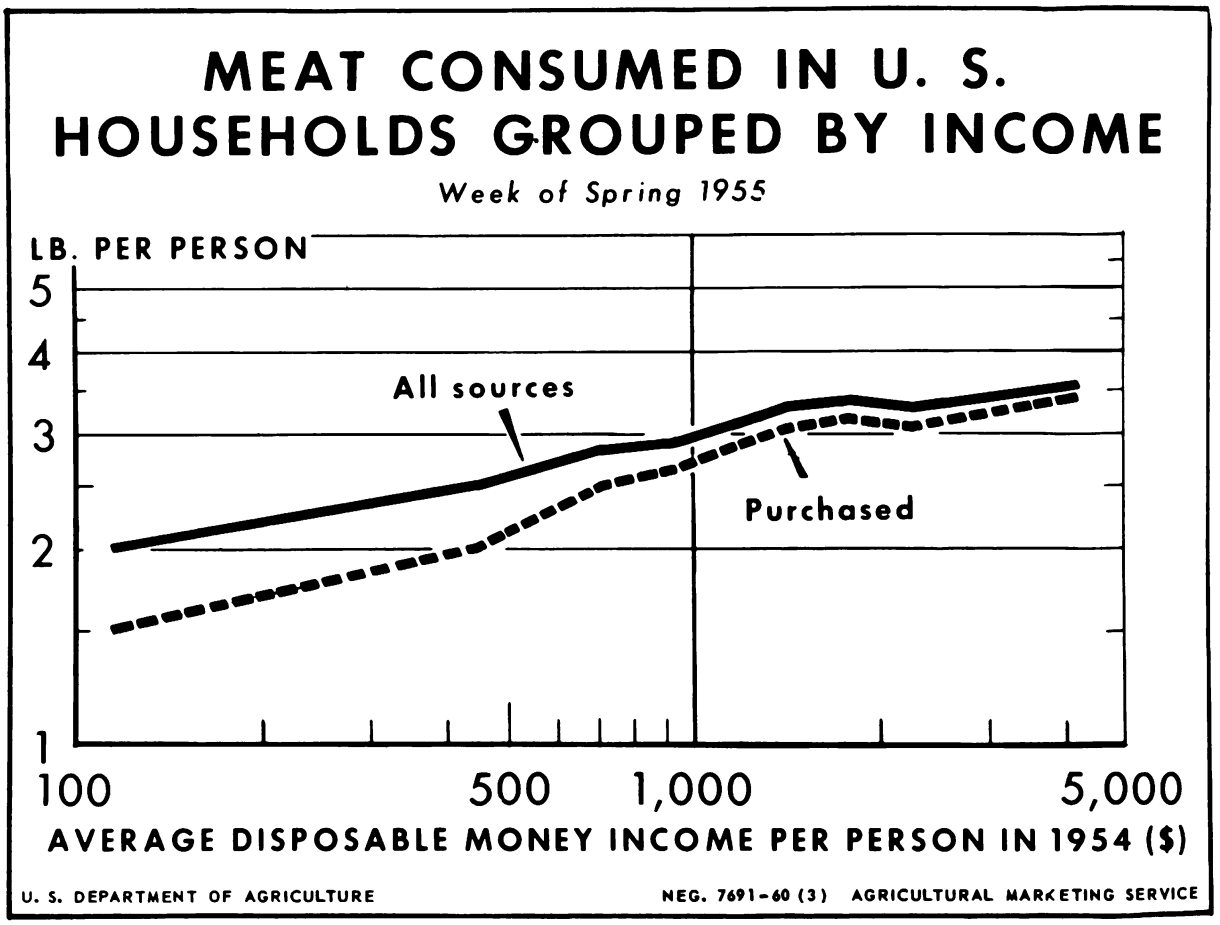

Figure 6

11/ Tables 2 and 7 contain data for such analyses. Annual data on home production given in Table 3 of Survey Report 12 (33).

Variations With Income.- Households in higher income groups used more meat per person than those with lower incomes (fig. 6). Rural nonfarm households with incomes under $2,000 had a lower average per person than either farm or urban households at this level of income. Also, rural households in the South with incomes under $2,000 consumed less meat than those of comparable income level in the other regions.

The quantity of meat purchased varies more from the lower to the higher income groups than the amount of meat used from all sources, including home-produced supplies and meats received as gifts or payments in kind (fig. 6). This is due in large part to the fact that the low income groups include a large proportion of farm households; these buy only about half of the meat they use. Within the farm population, higher-income households use not only more purchased meat but also more home-produced meat per person than those with lower incomes.

Variations in Consumption of Kinds of Meat

Excluding their content in luncheon meats, beef and pork accounted for about 80 percent of all meat used in the spring of 1955. For the United States as a whole, beef was a little more important than pork (fig. 7).

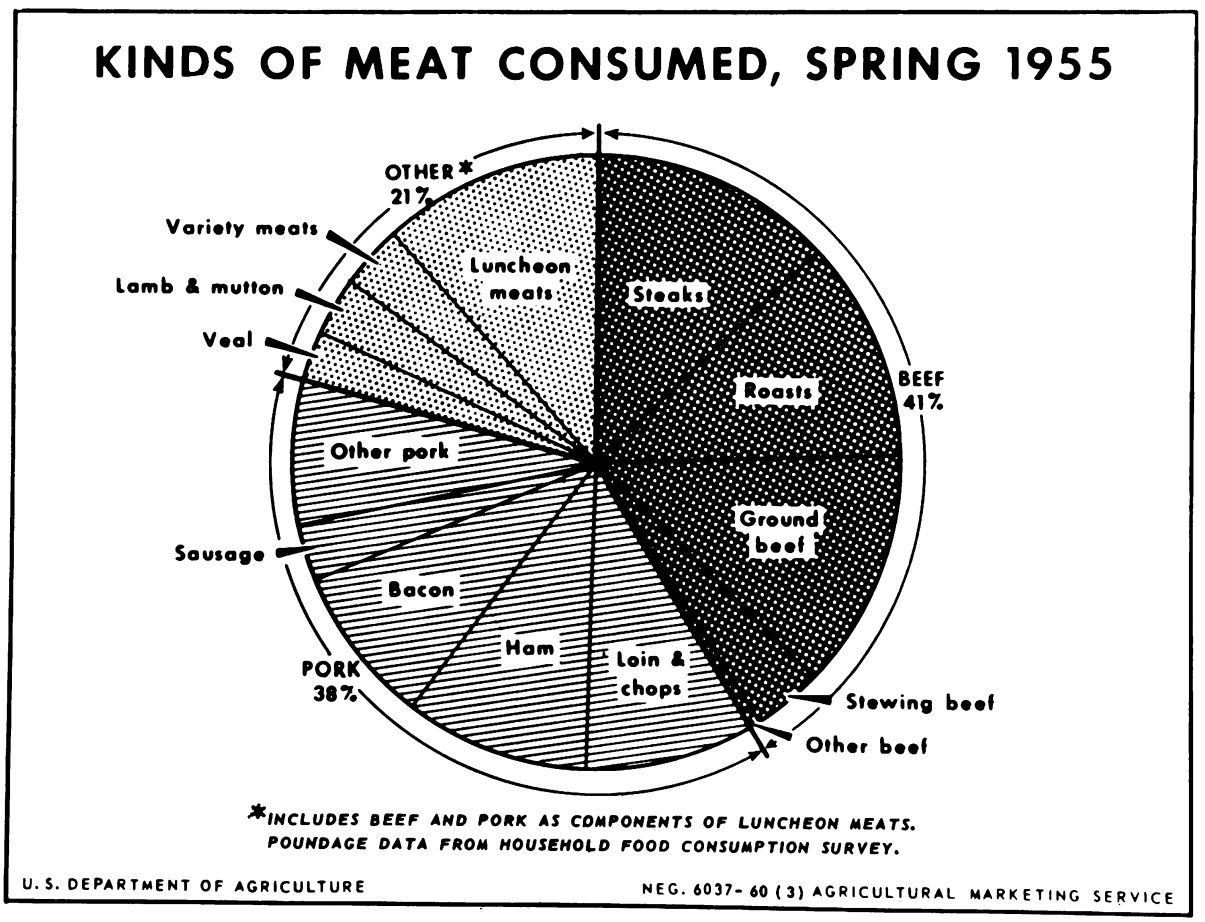

Figure 7

However, this varied among regions. The South used 50 percent more pork than beef, while the other regions consumed more beef than pork -- from 25 percent more in the North Central Region to 60 percent more in the West.

Luncheon meats, made largely from pork and beef, comprised another 12 percent of all meat used. Veal, lamb and mutton, and variety meats accounted for 9 percent. Veal and lamb and mutton were of much more importance in the Northeast than in the other regions. Lamb and mutton were also more significant in the West than in the North Central Region; very little was used in the South.

Regional and Urbanization Differences.- The quantity of each kind of meat used per person varied more among regional and urbanization groups than total quantity of meat used. Household consumption of beef differed more than that of pork. The West and North Central Region used the most beef per person -- 80 to 90 percent more than the South. The northeastern average was close to that for the whole country (fig. 8). 12/

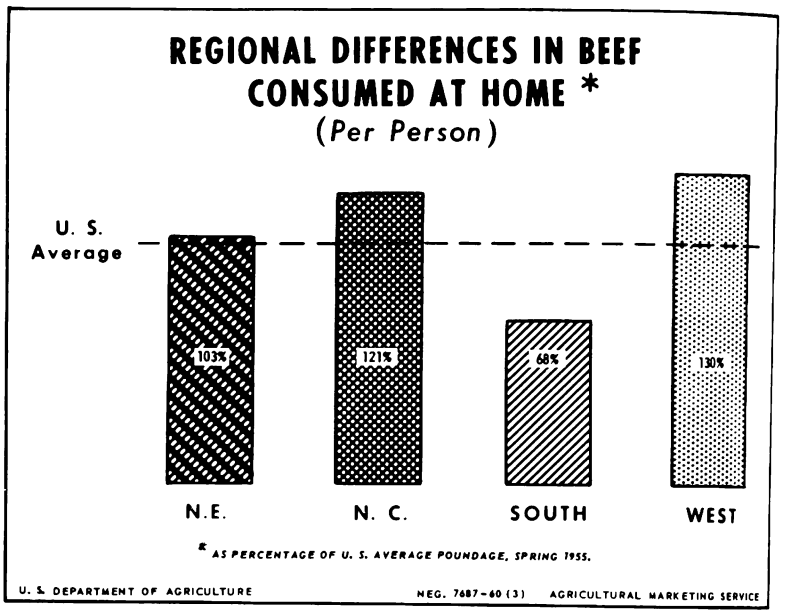

Figure 8

Purchases of beef were twice as large per person in the West as in the South. Although households in the North Central Region consumed more beef per person than those in the Northeast, average purchases in the two regions were about the same. The Northeast, with a smaller proportion of farm households, depended more on purchased supplies.

Variation among regions in household consumption of beef per person was greater in rural than in urban areas in the spring of 1955. The urban population used a little less beef per person in the South than in other regions, but the southern rural population consumed less than half as much as the rural average outside the South.

In the case of pork, households in the South and the North Central Region in the spring of 1955 used about a fourth more per person than those in the West and Northeast (fig. 9). 13/ Farm households in the South and the

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12/ Based on table 3.
13/ Based on table 4.

Northeast consumed about the same amount per person as the average for the country as a whole. Those in the North Central Region ranked first, using 50 percent more pork per person than those in the West, where production of hogs for sale or for home slaughter is of much less importance.

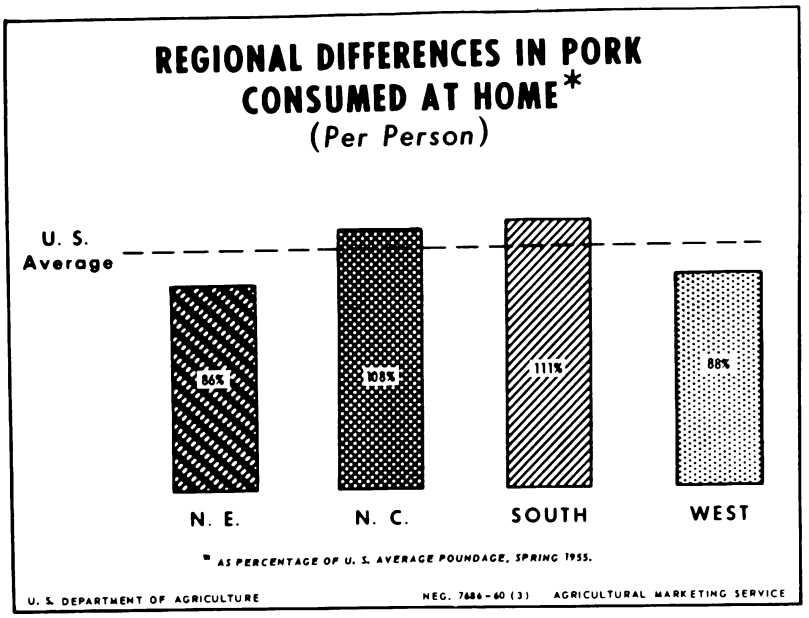


Figure 9

Consumption of veal and lamb and mutton per person varied more from region to region and from rural to urban areas than either beef or pork. Households in the Northeast consumed more of these meats per person than those in the other regions.14/ Southern averages were the smallest. The West used more lamb and mutton per person than the North Central Region. Among urban households, those in the North Central Region ranked second in the use of veal. The rural population, neither buying nor home producing much, consumed considerably less lamb and mutton per person, and also less veal, than the urban group.

Consumption of luncheon meats varied less per person from one region-urbanization group to another than was the case for any of the other kinds of meat. The North Central Region used a little more per person, and the South a little less, than the other regions. And rural nonfarm households used a little larger quantity than either urban or farm households. Practically all luncheon meats are purchased.

Differences Among Income Groups.- The influence of the disposable money income level on consumption is not the same for each kind of meat, being less for pork than other meats. However, even for pork, income is an important factor in the choice of cuts. 15/

14/ The high consumption level for lamb and mutton in the Northeast apparently reflects heavy consumption by its relatively high proportion of foreign-born, or of natives with foreign or mixed parentage, who come from the high lamb- and mutton-consuming countries of Europe and the eastern Mediterranean area.

15/ More detailed discussion of variations in purchases of individual cuts of meat is not given here because of the voluminous character of such detail. But some examples of such analyses are in Breimyer and Kause Consumption Patterns for Meat (41, pp. 25-28).

Higher income households used much more beef per person than those with lower incomes (fig. 10). 16/ The difference in beef consumption between households at lower and higher income levels was greater in the South than in the other regions. It was also greater among rural nonfarm than among farm or urban households.

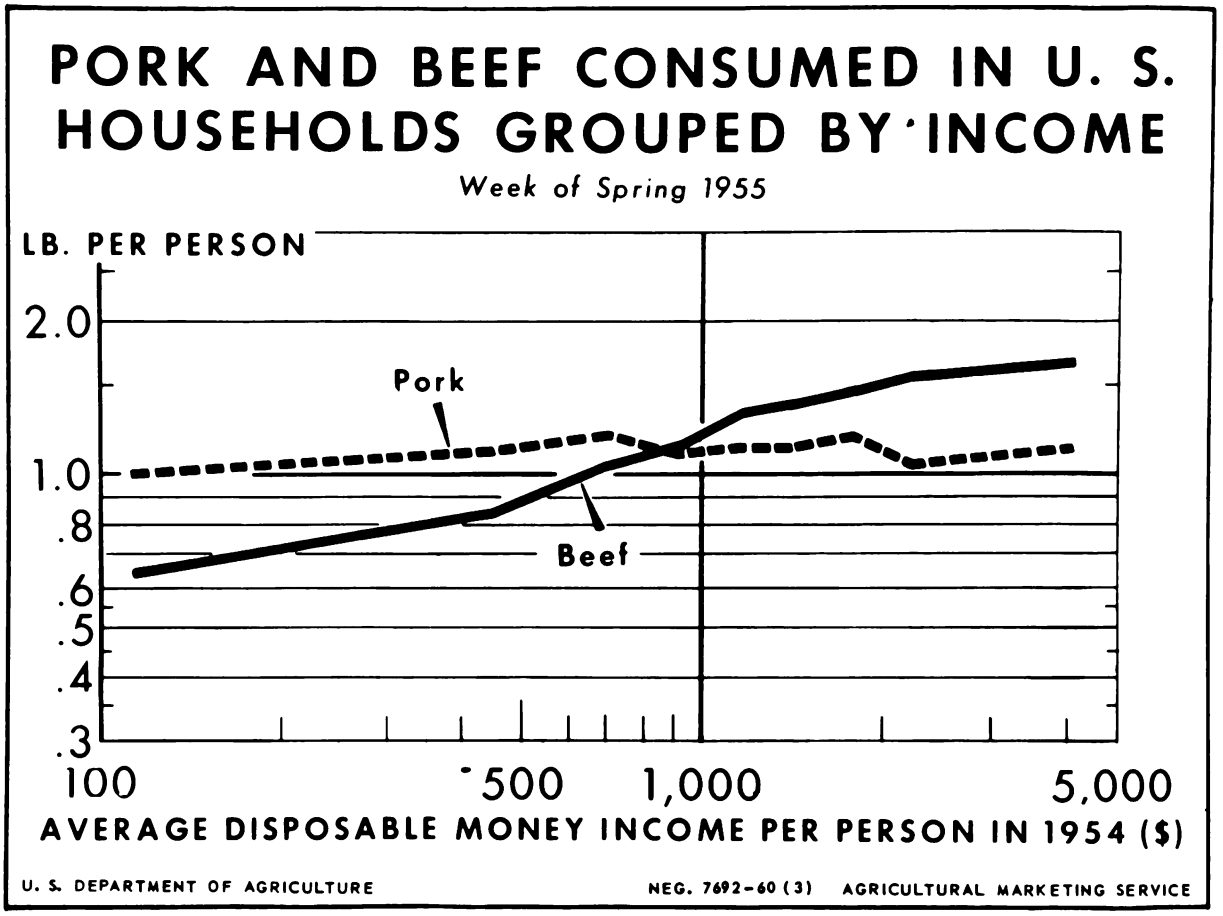


Figure 10

Households with higher incomes used more per person of higher priced cuts, such as steak and roasts, but less beef for stewing and boiling, than did those in lower-income groups. The middle-income groups consumed more ground beef than those with lower or higher incomes.

In contrast with the variability for beef, the quantity of pork used per person in the United States in the spring of 1955 varied little with income level (fig. 10). Among the regions, only in the West, where average pork consumption was less than in the other regions, did the quantity used per person increase in the upper range of incomes.

16/ Data in tables 3 and 4.

Differences among income groups in the use of pork are not the same for the urban and the farm population. In the farm category for the country as a whole, households with higher incomes consumed a little more pork per person than those with less to spend. Higher income urban households used relatively less, choosing more loin but not as much sausage or salt pork. In rural areas lower income households bought less pork per person but produced no more for their own use than did higher income households.

Although higher income households consumed about the same amount of ham and less sausage per person than did lower income households, they paid more per pound for what they bought in the spring of 1955, probably buying both better quality and more marketing services. For example, in the North Central Region urban households with incomes above $10,000 paid 16½ cents more per pound for sausage and 29 cents more for ham than those with incomes of less than $2,000.

Households with higher incomes also made more use of veal per person. Its use was of most importance among urban households, mainly in the Northeast and North Central Region.

The quantity of lamb and mutton consumed increased more than any other meat among households from the low to the higher income groups. Lamb and mutton are eaten most extensively in urban centers of the Northeast and the West. Rural households, which constitute a high proportion of the lower-income groups, use little lamb and mutton.

Middle-income households used a little more luncheon meat than did those in higher or lower income groups.

Influence of Home Production on Variations in Consumption

In the spring of 1955, households bought about 90 percent of the meat they consumed. Except for small amounts received as gifts or as pay, the remaining 10 percent was meat produced for home use. Urban households produce practically none, and rural nonfarm households only a little. Rural nonfarm households in the South and the North Central Region have more home-produced meat per person than those in the other two regions.

Home production supplied about half of the meat used by the farm population in the spring of 1955. In the North Central Region, where production for home use of both pork and beef is extensive, such supplies were a larger share of the meat used in farm households (almost 60 percent) than in the other three regions. The proportion was least in the South -- about 45 percent.

In the two regions with the highest proportion of rural population, the North Central Region and the South, home-produced meat was a greater share of the total meat used than in the two regions that are more urban. Home production ranged from about 12 percent of the meat used in the North Central Region and the South to 3 percent in the Northeast.

The North Central Region ranked first in the proportion of beef and also of pork supplied by home production. In this region both cattle and hog production for sale are important enterprises. Furthermore, five out of six farm households had freezing facilities for storing the meat. For farm households, home production of beef in the spring of 1955 ranged from two-thirds of the total used in the North Central Region to less than half in the South. Home-produced supplies of pork furnished almost 60 percent of all pork used in farm households in the North Central Region, 50 percent in the South, and only about 33 percent in the West.

Farm households with higher incomes not only buy more meat but use more home-produced meat than those with lower incomes. More of the higher income farm households have freezing facilities. This makes it easier to store home-produced meat, particularly beef, which does not lend itself to curing and storing without refrigeration. Much of the home-produced meat is a byproduct of livestock production for sale rather than production for home use only. The very low income farm groups include fewer households that raise livestock for sale and, therefore, fewer that have home-produced meat. Thus, low-income farmers in 1955 tended to produce for their own use less of the meat they consumed than those with higher incomes.

Variations in the Value of Meat Consumed

The retail value of meat consumed obviously depends upon the quantities used and prices per pound. 17/ Prices vary with kind of meat, cut, quality, amounts and costs of marketing services included in the purchase, and the general relationship of supply of each of the foregoing to demand in each area.

Regional Differences.- Among regions, the range in the values of meat used per person was greater in the spring of 1955 than the range in quantities used (fig. 11). The region which consumed the least meat per person, the South, also used less expensive meat. Therefore, the value of meat consumed there was lower, relative to other areas, than the quantity. The Northeast used more expensive meat. Thus, values there, relative to the other regions, averaged higher than quantities.

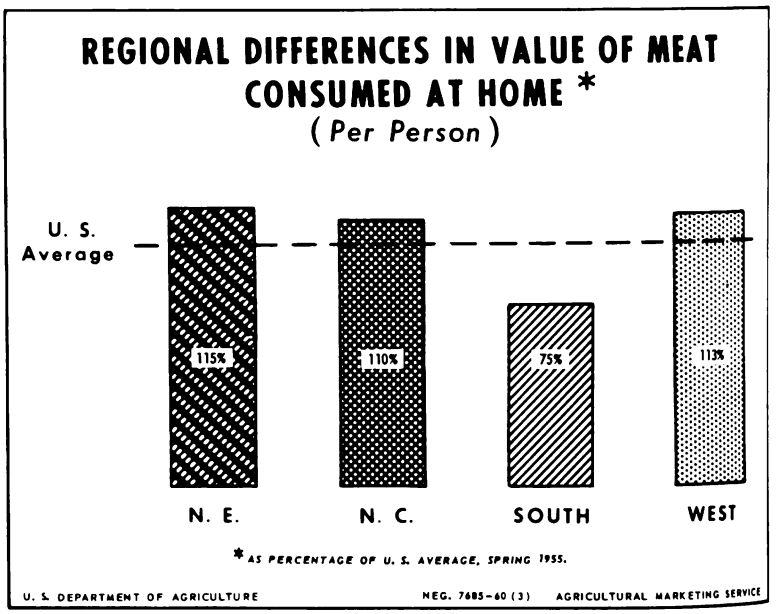


Figure 11

17/ Value data given in tables 5 and 6. Home-produced meat is valued at retail prices paid by households of the same urbanization and region in the spring 1955 survey.

The Northeast and the South provide an interesting contrast in the value of meat compared to the quantity used. Households in the Northeast consumed only a fifth more meat per person in the spring of 1955 than those in the South, but the retail price of the meat averaged almost a third more and the value half again as much. Average consumption at home in the Northeast included a larger proportion of the more expensive meats -- beef, veal, and lamb -- and a smaller proportion of pork, a less expensive meat. Expensive cuts were used more, too. Average beef consumption among households in the Northeast was half again as much per person, and its value almost twice as much. These households used less ground beef and more beef steak. Also the Northeast has a higher proportion of the higher income population, who buy better grades, as well as better cuts, and more marketing services. Although households in the Northeast consumed only three-fourths as much pork per person as those in the South, the value was as great, because more loin and less sausage and salt pork were included.

Urban-Rural Differences.- Urban average value of meat consumed in the spring of 1955 was almost 30 percent higher per person than that of rural nonfarm and 40 percent above the farm average.

This difference between the urban and the rural average values was greater than for the quantities consumed. The urban population includes a higher proportion of high-income households who use more of the expensive cuts. The higher average price per pound of meat in urban areas most likely covers more services. And for rural people, pork, which is less expensive than beef, veal, or lamb, is a larger share of total meat used.

Differences Among Income Groups.- The value of meat used per person also differed more, for households grouped by income, than the quantity used. The higher income population not only consumed more meat per person than those with less income but they had more expensive kinds and cuts.

As was the case for quantity of beef consumed per person, there was more variation among income groups in the value of the beef used than in that of pork. The value of beef steaks varied more than other beef cuts.

Although higher income groups used no more pork per person, the value of what they consumed was greater. From the lower to the higher income groups there was more variation in the value of loins and hams than of the other pork cuts.

Since there is less difference in cuts and quality of veal and lamb and mutton than in those of pork or beef, differences in the quantity used among households of varying income had a closer relationship to differences in value. Households with higher incomes used much more of these meats than those in the lower income groups, hence their values were also much greater.

In regard to luncheon meats, middle-income households consumed a little more per person than did others, but higher income people paid more per pound.

SECTION III. REGIONAL STRUCTURE OF THE U. S. MARKET FOR MEAT

In a study of the aggregate market for meat, it is reasonable to generalize from purchase patterns for household consumption (described in section II). Housekeeping households include about 94 percent of the total population. This section considers how the several regions share in the market for meat and how these shares compare with each region's contribution to commercial production.

The market for meat is considered here in terms of both quantity and expenditures, using data from the 1955 Household Food Consumption Survey. 18/ In terms of expenditures, a region's share of the U. S. market depends not only on (1) its share of the population and (2) whether its people buy more pounds or less per person than the U. S. average, but also on (3) whether they pay more or less per pound than U. S. average prices. Regional shares of meat purchased in the spring are considered to be representative of regional shares for the entire year. Because consumption patterns change slowly, shares of the market indicated by 1955 data are described in the present tense.

The Market for All Meat

The market for meat, in terms of aggregate expenditures, is far greater in the North Central Region and the Northeast than that in other regions -- each has about a third of the total (fig. 12). The Northeast has a smaller population and uses less meat per person than the North Central Region, but it buys most of the meat it uses and pays more per pound.

Relative to size of population, the Northeast and the West are the best markets for meat. On this basis, the South is the smallest market. It uses and buys less meat per person, and a larger proportion of the less expensive kinds and cuts. Although its population is about the same size as that of the North Central Region, its share of the U. S. market is a third less.

The South's share of the market for meat in terms of expenditures is less than its share of the quantity purchased, but the opposite is the case in the Northeast.

Comparison With the Market for All Foods.- The regional distribution of the market for meat is similar to that for all food. However, the Northeast has a little larger share -- the South, a little smaller share -- of the market for meat than for all food.

18/ Averages per household given in table 10 of Survey Reports 1-5 (33) were multiplied by number of households in the weighted sample, table 1, to derive aggregates. The aggregates for each region were then divided by the U. S. aggregates to derive regional shares.

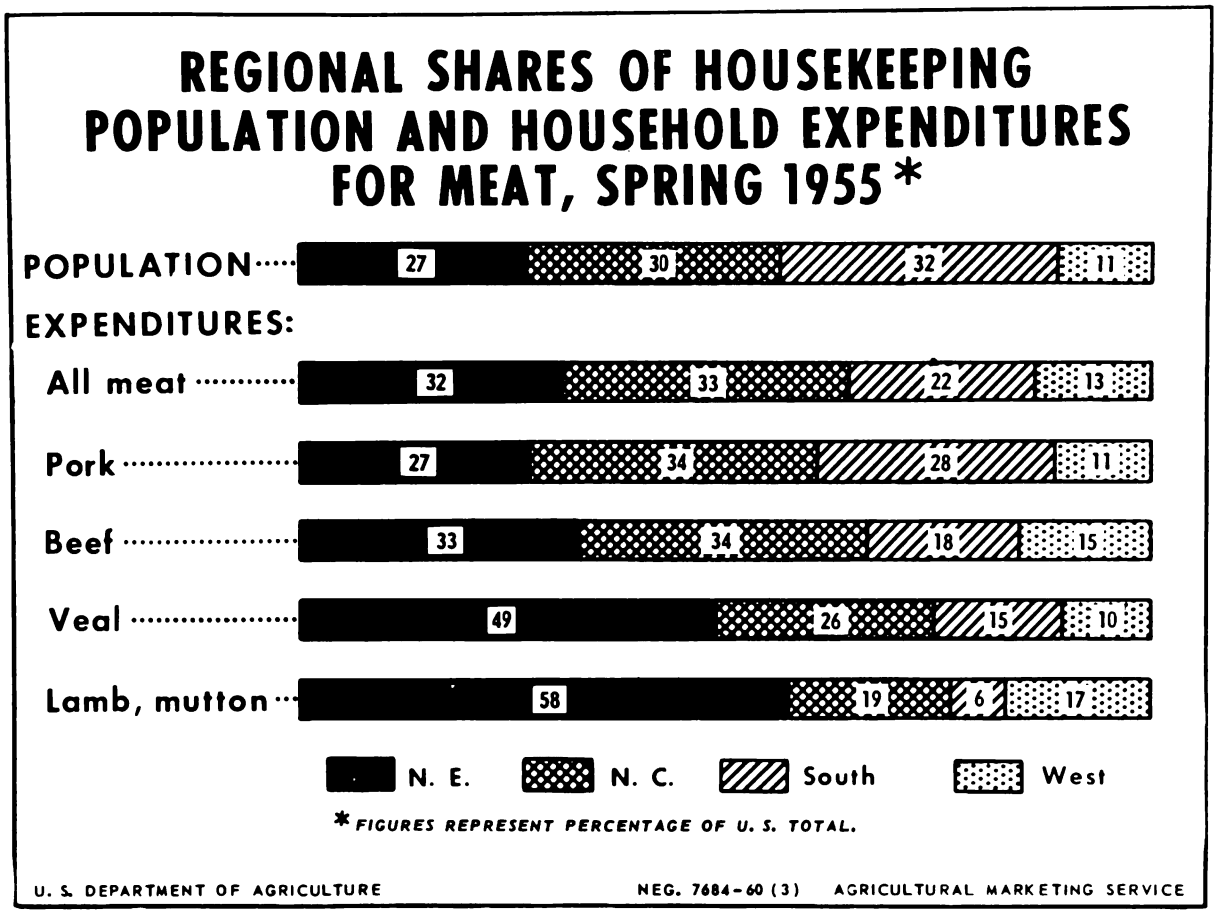


Figure 12

Although the Northeast is an excellent market for meat, it is an even better market for such meat substitutes as poultry and fish. With only 27 percent of the population, the Northeast's share of the United States market is 32 percent for meat; 35 percent for poultry; and 39 percent for fish and shellfish.

The Market for Each Kind of Meat

A region's share of the market varies among the kinds of meat. In terms of expenditures, the Northeast has a smaller share of the market for pork and a much larger share of the market for veal, lamb and mutton than for beef or for all meat. The North Central Region is important in both the beef and pork market, but less so in the market for veal, lamb and mutton. The South takes a larger proportion, and the West a smaller share, of the pork sold than for other meats.

Beef.- The North Central Region and the Northeast have the two largest shares of the beef market. Relative to population, the Northeast and the West are the best customers. Even though the South has almost three times as many people as the West, it spends in the aggregate only a fifth more for beef. Again, the South has a larger share of the market measured in quantity than in expenditures, since the South uses a larger proportion of the cheaper cuts.

Pork.- The North Central Region is the best market for pork, even better than would be expected from the size of its population. Although the South is relatively a better market for pork than for other meats, its share of expenditures for pork runs an eighth less than its share in the U. S. population. Southern households buy about the same aggregate quantity of pork as households in the North Central Region, but they pay less per pound, indicating the purchase of cheaper cuts and lower quality. The Northeast, though smaller in population and using less pork per person, spends as much for pork in total as the South.

Veal.- The Northeast accounts for almost half of the market for veal, even though it has only a little over a fourth of the population. The North Central Region ranks second with a fourth of the market, but the West is a better market relative to its population. The South's share is only half as large as its share in the population.

Lamb and Mutton.- A few large urban areas comprise a major part of the market for lamb and mutton. Rural groups use little and buy still less. The Northeast is the market for almost 60 percent of the lamb and mutton, a proportion twice as large as its share in the population. The West spends almost as much for lamb and mutton as the North Central Region, even though its population is only a little more than a third as large.

Comparison of Regional Shares of Production and of the Market

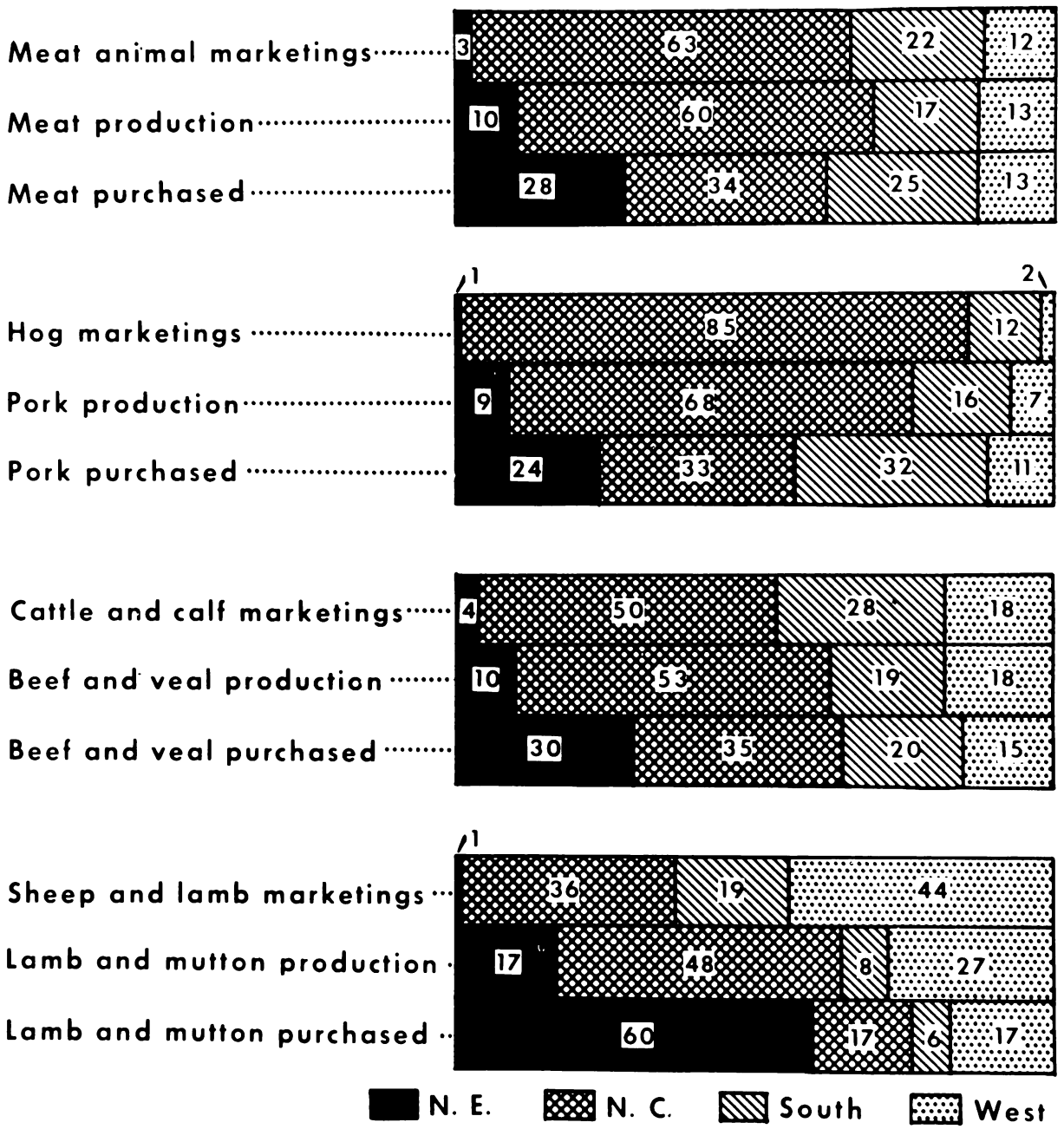
A region's share of the quantity of meat sold in the U. S. is related to its share in the population and national income. But its share of the net marketings of meat animals or of commercial slaughter depends on the location of the livestock and meat industries and may be very different from its share of the market (fig. 13).

Net marketings of meat animals refer to animals sold by farmers in a given area, less live weight of those purchased for breeding stock or further feeding. Commercial slaughter is the next step in the flow of meat from producers to consumers and refers to quantities of meat produced by commercial establishments in a given area. This excludes farm slaughter. Actual purchases by consumers represent the final stage in flow of meat into consumption. These differ from slaughter because there are changes in stocks from time to time, and trade in meat is carried on between regions.

Measured in quantities of meat purchased, the North Central Region is more important in the market for meat than any other region. The North Central Region is also a larger producer than any of the other regions, and it has a greater surplus of each kind of meat. 19/ In addition, substantial

19/ "Surplus" refers to excess of total slaughter for sale over total purchases for consumption in the region.

REGIONAL SHARES OF ANIMALS MARKETED, MEAT PRODUCED AND PURCHASED, 1955*



*FIGURES REPRESENT PERCENTAGE OF U. S. TOTAL. BASED ON LIVE WEIGHT OF NET ANIMALS MARKETED AND POUNDS OF MEAT PRODUCED COMMERCIALLY IN THE YEAR, AND THE QUANTITY OF PURCHASED MEAT CONSUMED AT HOME BY HOUSEHOLDS IN SPRING, 1955.

U. S. DEPARTMENT OF AGRICULTURE NEG. 7690-60 (3) AGRICULTURAL MARKETING SERVICE

Figure 13

numbers of hogs are sent to other regions for slaughter. But the North Central Region imports sheep from other regions for lamb and mutton production.

In contrast, the Northeast purchases about three times as much of each kind of meat as it produces. Furthermore, even its small meat production depends in large part on meat animals from other regions.

The South is another deficit supply area for meat. It buys both pork and hogs for slaughter to supply more than half of its demand for pork, which is larger than its market for other meats. At the same time, it has a surplus of cattle and sheep. The South included Texas and Oklahoma in the 1955 Survey of Household Food Consumption (fig. 4).

The West has a surplus of sheep, lamb and mutton, and some beef and veal but a deficit of hogs and pork.

Hog and pork production is highly concentrated in the North Central Region. The other regions buy both pork and hogs for slaughter for their pork supply.

Cattle and beef and veal are more widely produced than hogs and pork. The North Central Region and the West produce a surplus of beef; the South, a surplus of cattle for slaughter but not of beef for consumption.

As for sheep and lamb and mutton, the West markets more sheep than the North Central Region, but the latter accounts for almost half of the commercial slaughter. Both regions have a surplus of lamb and mutton. The centers of lamb and mutton consumption are largely in heavily populated metropolitan areas. According to a study of lamb consumption in 1954, New York and California each accounted for much more of the lamb and mutton market than any of the other States. 20/ These two accounted for a little less than half of the total U. S. shipments for consumption.

20/ Doty, Harry O., Jr. Distribution of Lamb and Mutton for Consumption in the U. S. (79, p. 5) and Lamb Availability and Merchandising in Retail Stores (80, p. 7).

SECTION IV. MEAT CONSUMPTION OUTSIDE HOUSEHOLDS

There is no comprehensive information on meat consumption outside private homes. Although about 18 percent of the food sold to U. S. civilians is handled by eating places, including public and private institutions, we do not know how much of this total is meat or any other commodity. 21/ It is difficult and costly to collect information representative of the heterogeneous food service industry -- restaurants of all kinds and sizes, business establishments that serve meals to employees, schools that serve lunches, hospitals, and all sorts of institutions serving meals to residents.

Since the two sectors of this market that have been surveyed (described below) make up only a small part of the total, most analyses must be based on patterns of purchases and consumption in private households. Such a procedure assumes that use of meat at home by the 94 percent of the civilian population living in housekeeping households is generally representative of total meat consumption, including meat in meals consumed away from home by the housekeeping population and in all meals consumed by people living in nonhousekeeping quarters such as hotels and rooming houses and in institutions. We have no way of knowing to what extent lower rates of meat consumption in institutions with minimum budgets may offset high meat consumption in elaborate restaurant meals.

The two sectors of away-from-home eating which have been comprehensively surveyed are employee food services in large manufacturing plants and lunches served in public schools. The survey of manufacturing plants, which was conducted in 1956, revealed that meat accounted for 21 cents out of each dollar spent for food, compared with 25 cents of the household food dollar. 22/ The school lunch study found that meat accounted for 14 percent of the value of food used, -- this included both purchased and donated supplies. 23/

An indication of range in shares of food outlays allocated to meat by institutions was derived from case studies of 16 non-Federal institutions conducted in 1952. 24/ The proportion for lean meat, poultry, and fish ranged from 21 to 31 percent, and the range for lean and fat cuts of meat apparently was from about 18 percent to 28 percent. No comprehensive study of food consumption in institutions for the whole country has yet been made.

21/ Overall estimate based on approximate retail values of all civilian food sold and of food consumed away from home. For further information, see Burk, Marguerite C. "Significance of Current Developments in Food Statistics" (43, pp. 7-8).

22/ Lifquist, Rosalind C. Buying Practices and Food Use of Employee Food Services in Manufacturing Plants (35, pp. 7-8).

23/ Anderson, Kenneth E. and Hoofnagle, William S. The Market for Food in Public Schools (34, p. 3).

24/ Hoofnagle, William S., Dwoskin, Philip B., and Bayton, James A. The Market for Food in Selected Public and Private Institutions (87).

Commercial eating places constitute the largest sector of the eating-place market. They include street restaurants; hotel dining facilities; restaurants and lunch counters in department stores, variety stores, and drug stores; and other counter and fountain types of food services. While no comprehensive survey has been made of this sector, we do have the findings of a small number of case studies in Minnesota in 1950. Twenty commercial eating places in Minneapolis were studied. They reported percentages of food purchases allocated to meat, ranging from 7 percent in a fountain-lunch establishment to 40 percent in a high-priced establishment specializing in fine steaks. 25/

Even though no conclusions concerning meat consumption patterns away from home can be nailed down, some information about kinds and cuts of meat and special marketing services required by eating places is available from representatives of the food service industry and from meat dealers doing business with them.

Kinds and Cuts of Meat

Places serving more expensive meals are likely to emphasize beef, especially the better cuts and grades. They also serve lamb and veal and the more expensive cuts of pork. On the other hand, those catering to children or the luncheon and snack trade, or those serving less expensive meals, use more hamburgers and frankfurters. Meals outside households probably include less of the breakfast meats such as bacon and sausage. In the in-plant feeding study referred to earlier, beef and pork represented the bulk of the meat purchased, with luncheon meats ranking next, as is the case for meat used in households. Veal was the most important of the minor meats. Plants in the West used the most beef and the least pork, and the Northeast, though using only small amounts of lamb, used more than the other regions. In the school lunch program beef ranks first. 26/ More than twice as much beef as luncheon meat is used, and four times as much beef as pork.

Special Marketing Services

Since eating establishments buy meat in larger quantities than do households, their purchasing practices differ. Except for the smaller eating places, most of the meat is bought from wholesalers and packers, although commonly in retail cuts. They often buy by specification, including grade and other characteristics. To save labor, they tend to buy meat in portion-size cuts or in prepared foods. For some, frozen meats may best suit the needs. For in-plant feeding services, referred to earlier, most meat was purchased at wholesale but in the form of retail cuts, and 15 percent of the money spent by the plants for these cuts went for portion-size cuts.

25/ Sartorius, Lester C. and Burk, Marguerite C. Eating Places as Marketers of Food Products, Mktg. Res. Rept. 3 (36, p. 63).

26/ Hoofnagle, William B. and Anderson, Kenneth A. "The Market for Meat in the Nation's Schools," Livestock and Meat Situation, May 1959 (53, p. 32).

SECTION V. IMPLICATIONS FOR FUTURE MEAT CONSUMPTION

Some implications for future trends in meat consumption can be drawn from analyses of historical trends and changes in patterns of consumption plus projections of purchasing power and population changes. Major historical trends in meat consumption are first reviewed. Next, information on changes in consumption indicated by two household food surveys is summarized. Brief reviews of projections of the economic framework for 1975 and 1980 and related projections of overall domestic food use and meat consumption set the stage for the final subsection -- indications of future patterns of meat purchases and meat marketing.

Changes in per capita meat consumption in the last 25 years may be summarized thus: Average consumption has increased substantially from the low levels of the 1930's for beef and pork, returning to the high levels of the years before World War I. There is evidence of greater increase in the demand for beef than for pork. Consumption of veal and of lamb and mutton has averaged below the rates of the 1930's in several recent years.

Changes in Consumption Patterns

Data from nationwide household food consumption surveys in spring 1942 and spring 1955 tell us much about the changes in patterns of meat consumption lying behind the changes in overall averages. 27/ Consumption rates for urban, rural nonfarm, and farm households all rose significantly, but the average increase was greater for the rural than the urban population. All income groups shared about equally in the increase, particularly for beef.

About three-fourths of this increase in meat consumption per person in the United States was associated with the increase in the general level of consumption by households at each income level in each urbanization category. Most of the balance resulted from the net shift in the population upward on the scale of real income.

A major part of the increase in meat consumption per person between 1942 and 1955 was in the consumption of beef, particularly so for farm people. Beef was more generally available in all markets, and the price was relatively low in 1955, encouraging buying. Higher consumption in farm households included more home-produced meats per person as well as larger purchases.

The decrease in the number of farms during this period had something to do with the increase in home production of beef per person on farms, for those leaving the farm included a large proportion of low-income farmers, particularly in the South. This group used relatively little beef, and home produced

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27/ Data for spring 1942 derived from Misc. Pub. 550, Family Food Consumption in the United States, Spring 1942 (23).

still less. 28/ Also, the proportion of farms reporting the sale of cattle -- those most likely to have home-produced beef -- rose from 43 percent in 1939 to 55 percent in 1954. 29/ The use of freezing facilities -- locker plants or deep freezers at home, or both -- became more common in the years between 1939 and 1954, especially in higher income households. Many of these households raise cattle. The result has been the use of more home-produced beef. Beef does not lend itself to curing and storing without refrigeration as does pork. 30/

Consumption patterns for pork and lamb and mutton apparently have changed much less than those for beef.

Summary of Projected Economic Framework for 1975 to 1980

A number of sets of economic projections for 1975 to 1980 have been developed in recent years to evaluate prospects for food supplies and demand. One of the most widely known was developed by Rex F. Daly. 31/ The most recent overall economic framework was developed by the staff of Resources for the Future, Inc. and used in the Land and Water Report of the Department of Agriculture, made to the Senate Select Committee on National Water Resources. 32/ These two sets of projections differ primarily in their estimates of population growth, reflecting recent upward revision in projections by the Bureau of the Census. Daly used the top of the range of the 1955 Census projections of 230 million for 1975. This is 37 percent above 1956 (for 19-year period). The Land and Water Report used a 29 to 60 percent range for the increase in total population from 1958 to 1980. These yield population estimates in 1980 of 225 to 278 million.

Both sets of projections assume that the labor force and total employment will rise more rapidly than total population because a larger proportion of the total will be in the working age group. All of the gain in employment is assumed to be in the nonagricultural sector. Gains in productivity projected in the Land and Water Report indicate a greater rise in gross national

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28/ Burk, Marguerite C. "An Economic Appraisal of Changes in Rural Food Consumption," Jour. Farm Econ., Aug. 1958 (42, pp. 581-582).

29/ Orshansky, Mollie, "Changes in Farm Family Food Patterns" (62, p. 8).

30/ Burk, Marguerite C., and Gronbech, Gertrude, "Home Food Production: Part II," National Food Situation, July 1958 (46, p. 45).

31/ Daly, Rex F. "Prospective Domestic Demands for Food and Fiber," paper submitted to the Subcommittee on Agricultural Policy, Joint Economic Committee of the Congress (51).

32/ U. S. Department of Agriculture. Land and Water Potentials and Future Requirements for Water (66).

product than in total employment, the increase ranging from 85 to 140 percent above 1960. The low estimate for 1980 would provide a 50 percent rise in gross national product per capita from 1960 to 1980. For the Land and Water Report, the Department's staff assumed that the 1960 price level would be applicable for 1980 and that recent price relationships among farm commodities would continue.

Projections of Food and Meat Consumption

Based on his economic framework and the assumption of continuation of 1956 domestic price levels for farm products, Daly projected, from 1956 to 1975, a 7 percent increase in per capita utilization of farm commodities for domestic food. This amounted to a 10 percent increase from 1954 to 1975. His comparable projection for food livestock products was about the same. For meat animals the projected increase under this price assumption was slightly higher than for all food.

Daly also used an alternative price assumption based on 1956 world prices for major export crops. The second set of projections included an 11 percent per capita increase for all domestic farm food from 1956 to 1975, 14 percent from 1954.

The projections for the Land and Water Report are extensions of Daly's projections, but tied to 1960 commodity price relationships. From 1954 to 1980 these projected increases amount to 11 percent per capita for all farm foods, 12 percent for food use of livestock products, and 16 percent for meat animals. Both sets of projections reflect greater pressure of rising demand on beef supplies than on pork.

These projections apply to overall consumption, including home-produced supplies. One study has pointed out the likelihood of substantially greater increases in quantity of food purchased per capita, because of the expected decline in home food production, but did not report projections for commodity purchases. 33/

Indications of Further Changes in Meat Purchases and Marketing

Changes in income, degree of urbanization, and in meat production and marketing will materially influence patterns of meat purchases. By patterns we refer here to variations in consumption by population groups at a given time and variations over time.

33/ Burk, Marguerite C. "An Economic Appraisal of Changes in Rural Food Consumption" (42, p. 587).

Changes in Real Income.- In the description of variations in the consumption rate of meat among income groups given in section II, it was noted that households with higher incomes consume more meat per person than those with lower incomes. Therefore, the projected net shift of the population up the real income scale will tend to increase the demand for meat. Such increases will likely be greater for families moving from the lower end of the range toward the level of 1955 average real income. Although higher incomes for families currently in the middle and high income groups will mean some increase in the quantity of meat purchased, the amount of money spent for meat is likely to increase even more. Both types of change will result in a greater variety of meats being purchased, possibly increasing the demand for veal and for lamb and mutton.

Another area of change is likely to be in the demand for more expensive processing and other marketing services, as well as for the more expensive meats and cuts and grades. This could lead to a further decline in the relative importance of pork. Meat-type hogs might gain an advantage over other types. Stronger demand for better cuts of meat might lead to a greater price spread among various cuts. The same phenomenon is likely to occur among grades of meat. This would encourage further improvement of livestock.

Urbanization Shifts in Population.- Since the farm population depends on the commercial market for only half of the meat it consumes, further shifts in population from farm to nonfarm will step up the demand for commercially produced and slaughtered meat. This will result not only from a concurrent decline in home production, but from greater consumption of meat by those who leave the farm to earn higher incomes.

Increased purchases with choices no longer restricted by meat available from home production will lead to demand for greater variety in the kinds of meat used. For example, low-income farmers who have been using home-produced pork will substitute purchased meat when they move away from the farm to better paying jobs in town. They will undoubtedly continue to consume pork, but they are likely to use more of the other meats than they did while on the farm. A shift of the population off the farm may also lead to more eating of meals away from home, and thus to larger expenditures for meat.

Potential Production and Marketing Changes.- Only brief reference can be made here to possible changes in meat production and marketing which may affect trends in meat consumption.

Improved quality of meat will influence competition among kinds of meat. Increased emphasis on meat-type hogs may strengthen demand for pork. 34/ Integration in hog production may smooth out fluctuations in supply and also

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34/ Engelman, Gerald and Gaarder, Raymond O. Marketing Meat-Type Hogs, Mktg. Res. Rept. 227 (83).

speed up the shift to meat-type hogs. 35/ Present tendencies toward decentralization and specialization of slaughter may change price relationships and reduce differences in meat consumption among regions. Price relationships among kinds and types of livestock may also be affected by nutritional findings regarding animal fats.

Technological changes in marketing are also likely to affect meat consumption. Any advance in the technique of making meat less perishable would mean that cyclical fluctuations in supply could be reduced by changes in stocks. The flow into distribution could follow more closely the comparatively steadier trend in consumer demand for meat. Some of the improvements in the preservation of meat that may become practical are sterilization by radiation, the use of antibiotics, dehydration, and new freezing techniques.36/ In addition to minimizing variations in supply, seasonal as well as cyclical, new methods of preservation could cut down on shipping and storage costs. This would increase the quantity and maintain the quality of meat moving to small stores and to homes with limited refrigeration facilities or none at all. It would have the greatest impact in the South, or in isolated rural areas, where perishability limits market supplies most. If new methods of preservation cost less than the saving in shipping and storage charges, total marketing costs would be lower.

Changes in preparation of meat to supply particular needs of customers may also influence the market structure. New equipment and materials are coming into use for the prepackaging of meat. Portion-size cuts for restaurant and home use are becoming more popular. New and varied forms of processed meats may be expected, including frozen portion-size cuts and specialty products. 37/

Organizational changes in meat marketing may influence changes in meat purchase patterns. In the displays of prepackaged meats now in common use in supermarkets, appearance has an important bearing on sales. Also mass merchandising tends to promote the grading of meat and more extensive preparation of meats.

35/ Engleman, Gerald, "Integration in Livestock Industry," Marketing and Transportation Situation, Nov. 1958 (82, pp. 31-32).

36/ Cook, Harold T. and Pentzer, W. T. "Antibiotics for the Preservation of Food Products," Agricultural Marketing, Jan. 1959 (78).

37/ U. S. Agricultural Marketing Service, "The Outlook for Frozen Foods," Marketing and Transportation Situation, Oct. 1956 (105, pp. 22-24, 29, and 34-37).

Table 1.--Per capita meat consumption, by kinds, and population, 1909-59 1/

Year	Carcass weight 2/					Retail weight 3/						Population, July 1 5/
	Beef	Veal	Lamb and mutton	Pork	Total	Beef 4/	Veal 4/	Lamb and mutton 4/	Pork 4/	Edible offals	Total	
	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Mil.
1909	74.2	7.3	6.7	67.0	155.2	58.6	6.6	6.0	62.4	11.1	144.7	90.5
1910	70.4	7.2	6.5	62.3	146.4	55.6	6.6	5.8	57.9	10.3	136.2	92.4
1911	68.5	7.1	7.3	69.0	151.9	54.1	6.5	6.5	64.1	10.8	142.0	93.9
1912	64.6	6.9	7.7	66.7	145.9	51.0	6.3	6.9	62.1	10.3	136.6	95.3
1913	63.3	6.3	7.2	66.9	143.7	50.0	5.7	6.4	62.2	10.1	134.4	97.2
1914	62.0	5.8	7.1	65.1	140.0	49.0	5.3	6.3	60.5	9.6	130.7	99.1
1915	56.4	5.9	6.1	66.5	134.9	44.6	5.4	5.4	61.8	10.1	127.3	100.5
1916	58.9	6.4	5.8	69.0	140.1	46.5	5.8	5.2	64.1	10.6	132.2	102.0
1917	64.7	7.2	4.5	58.9	135.3	51.1	6.6	4.0	54.8	10.3	126.8	103.4
1918	68.5	7.3	4.8	61.0	141.6	54.1	6.6	4.3	56.7	10.6	132.3	104.6
1919	61.5	7.8	5.7	63.9	138.9	48.6	7.1	5.1	59.4	11.0	131.2	105.1
1920	59.1	8.0	5.4	63.5	136.0	46.7	7.3	4.8	59.1	10.2	128.1	106.5
1921	55.5	7.6	6.1	64.8	134.0	43.8	6.9	5.4	60.2	9.7	126.0	108.5
1922	59.1	7.8	5.1	65.7	137.7	46.7	7.1	4.5	61.1	10.0	129.4	110.1
1923	59.6	8.2	5.3	74.2	147.3	47.1	7.5	4.7	69.0	10.7	139.0	112.0
1924	59.5	8.6	5.2	74.0	147.3	47.0	7.8	4.6	68.8	10.5	138.7	114.1
1925	59.5	8.6	5.2	66.8	140.1	47.0	7.8	4.6	62.1	10.2	131.7	115.8
1926	60.3	8.2	5.4	64.1	138.0	47.6	7.5	4.8	59.6	9.7	129.2	117.4
1927	54.5	7.4	5.3	67.7	134.9	43.1	6.7	4.7	63.0	9.4	126.9	119.0
1928	48.7	6.5	5.5	70.9	131.6	38.5	5.9	4.9	66.0	9.0	124.3	120.5
1929	49.7	6.3	5.6	69.6	131.2	39.3	5.7	5.0	64.7	9.0	123.7	121.8
1930	48.9	6.4	6.7	67.0	129.0	38.6	5.8	6.0	62.4	8.9	121.7	123.1
1931	48.6	6.6	7.1	68.4	130.7	38.4	6.0	6.3	63.7	9.2	123.6	124.0
1932	46.7	6.6	7.1	70.7	131.1	36.9	6.0	6.3	65.8	9.2	124.2	124.8
1933	51.5	7.1	6.8	70.7	136.1	40.7	6.5	6.1	65.8	9.3	128.4	125.6
1934	63.8	9.4	6.3	64.4	143.9	50.4	8.6	5.6	59.9	9.6	134.1	126.4
1935	53.2	8.5	7.3	48.4	117.4	42.0	7.7	6.5	45.0	8.1	109.3	127.2
1936	60.5	8.4	6.6	55.1	130.6	47.8	7.6	5.9	51.2	8.4	120.9	128.1
1937	55.2	8.6	6.6	55.8	126.2	43.6	7.8	5.9	51.9	8.8	118.0	128.8
1938	54.4	7.6	6.9	58.2	127.1	43.0	6.9	6.1	54.1	8.5	118.6	129.8
1939	54.7	7.6	6.6	64.7	133.6	43.2	6.9	5.9	60.2	8.9	125.1	130.9
1940	54.9	7.4	6.6	73.5	142.4	43.4	6.7	5.9	68.4	9.7	134.1	132.1
1941	60.9	7.6	6.8	68.4	143.7	48.1	6.9	6.1	63.7	10.1	134.9	131.8
1942	61.2	8.2	7.2	63.7	140.3	48.3	7.5	6.4	59.2	11.5	132.9	131.5
1943	53.3	8.2	6.4	78.9	146.8	42.1	7.5	5.7	73.4	12.4	141.1	128.9
1944	55.6	12.4	6.7	79.5	154.2	43.9	11.3	6.0	74.0	13.5	148.7	128.6
1945	59.4	11.9	7.3	66.6	145.2	46.9	10.8	6.5	61.9	12.6	138.7	129.1
1946	61.6	10.0	6.7	75.8	154.1	48.7	9.1	6.0	70.6	11.3	145.7	138.4
1947	69.6	10.8	5.3	69.6	155.3	55.0	9.8	4.7	64.7	11.2	145.4	142.6
1948	63.1	9.5	5.1	67.8	145.5	49.8	8.6	4.5	63.1	10.3	136.3	145.2
1949	63.9	8.9	4.1	67.7	144.6	50.5	8.1	3.6	63.0	10.1	135.3	147.6
1950	63.4	8.0	4.0	69.2	144.6	50.1	7.3	3.6	64.4	10.1	135.5	150.2
1951	56.1	6.6	3.4	71.9	138.0	44.3	6.0	3.0	66.8	9.9	130.0	151.1
1952	62.2	7.2	4.2	72.4	146.0	49.1	6.6	3.7	67.4	10.2	137.0	153.4
1953	77.6	9.5	4.7	63.5	155.3	61.3	8.6	4.2	59.1	10.8	144.0	156.0
1954	80.1	10.0	4.6	60.0	154.7	63.3	9.1	4.1	55.8	10.6	142.9	159.1
1955	82.0	9.4	4.6	66.8	162.8	64.8	8.6	4.1	62.1	11.0	150.6	162.3
1956	85.4	9.5	4.4	67.4	166.7	67.5	8.6	3.9	62.7	11.2	153.9	165.3
1957	84.6	8.8	4.2	61.5	159.1	66.8	8.0	3.7	57.2	10.5	146.2	168.4
1958	80.5	6.7	4.1	60.7	152.0	63.6	6.1	3.6	56.5	9.9	139.7	171.4
1959 6/	81.6	5.7	4.5	68.3	160.1	64.5	5.2	4.0	63.5	10.2	147.4	174.4

1/ Civilian consumption only, beginning 1941. Excludes game.

2/ Approximately at wholesale distribution level. From table 8, Agr. Handb. 62 Consumption of Food in the United States, 1909-52, supplements for 1956 and succeeding years (3).

3/ From table 28, Agr. Handb. 62.

4/ All meat consumed per capita, including processed, in terms of fresh retail cuts. Carcass weight (at wholesale) converted to fresh retail equivalents using the following average factors: Beef, 79 percent; veal, 91 percent; lamb and mutton, 89 percent; lean pork, 65 percent of carcass weight of pork; fat pork (bacon and salt side), 28 percent of carcass weight of pork.

5/ Beginning in 1941 includes only those eating out of civilian supplies. From table 53, Agr. Handb.62.

6/ Preliminary.

Table 2.--Quantity of meat used per person, households of 2 or more persons, by region, urbanization, and income, in a week, spring 1955 1/

Income (dollars) 2/	United States	North-east	North Central Region	South	West	United States	North-east	North Central Region	South	West
	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.
	All urbanizations					Urban				
Households of 2 or more persons 3/	3.03	3.07	3.37	2.56	3.37	3.18	3.10	3.42	2.93	3.30
Under 1,000	2.02	2.11	2.82	1.76	3.30	2.81	2.03	3.32	2.66	2.62
1-2,000	2.47	2.29	3.04	2.29	2.72	2.75			2.93	
2-3,000	2.86	3.04	3.31	2.58	2.84	2.92	2.86	3.37	2.83	2.52
3-4,000	2.90	2.89	3.15	2.57	3.29	2.97	2.95	3.22	2.65	3.31
4-5,000	3.14	3.05	3.30	2.99	3.17	3.13	3.09	3.25	3.11	3.03
5-6,000	3.27	3.17	3.54	2.91	3.41	3.33	3.26	3.56	2.91	3.47
6-8,000	3.37	3.38	3.51	3.07	3.34	3.40	3.43	3.51	3.19	3.18
8-10,000	3.28	2.86	3.42	3.19	3.94	3.20	2.68	3.44	3.26	3.82
10,000 and over	3.55	3.13	3.42	3.40	4.50	3.60	3.04	3.58	3.47	4.36
	Rural nonfarm					Farm				
Households of 2 or more persons 3/	2.81	2.93	3.19	2.32	3.59	2.83	3.33	3.45	2.19	3.33
Under 1,000	1.58	2.04	2.51	1.46	2.52	2.03	3.52	2.71	1.70	3.59
1-2,000	2.08			1.81		2.57	3.17	3.40	2.11	
2-3,000	2.73	3.23	3.16	2.29	3.36	2.98	3.66	3.37	2.54	3.04
3-4,000	2.73	2.62	2.96	2.48		3.00	3.20	3.34	2.52	
4-5,000	3.08	2.83	3.21	2.96	3.53	3.36	3.88	3.77	2.49	3.17
5-6,000	3.15	2.97	3.53	2.90		3.33	3.35	3.46	3.03	
6-8,000	3.35	3.46	3.12	3.01	4.98	3.20	2.91	3.77	2.75	3.66
8-10,000	3.47					3.58				
10,000 and over	3.05					4.20				

1/ Based on retail weight data in 1955 Household Food Consumption Survey Reports 1-5 (33). The average used per household, from all sources, table 10, was divided by the average household size, table 3. Includes game.
2/ 1954 family money income after income taxes.
3/ Includes households not reporting income.

Table 3.--Quantity of beef used per person, households of 2 or more persons, by region, urbanization, and income, in a week, spring 1955 1/

Income (dollars) 2/	United States	North-east	North Central Region	South	West	United States	North-east	North Central Region	South	West
	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.
	All urbanizations					Urban				
Households of 2 or more persons 3/	1.25	1.28	1.52	0.85	1.63	1.34	1.29	1.53	1.09	1.53
Under 1,000	.65	.86	1.20	.46	1.63	.96	.71	1.30	.80	1.37
1-2,000	.85	.99	1.23	.66	1.30	.95			.91	
2-3,000	1.05	1.34	1.42	.73	1.18	1.08	1.23	1.37	.91	.91
3-4,000	1.16	1.14	1.41	.84	1.57	1.19	1.18	1.44	.92	1.38
4-5,000	1.34	1.29	1.48	1.05	1.60	1.34	1.29	1.41	1.22	1.49
5-6,000	1.40	1.22	1.59	1.13	1.73	1.47	1.26	1.67	1.21	1.77
6-8,000	1.47	1.41	1.58	1.26	1.60	1.48	1.43	1.53	1.47	1.46
8-10,000	1.58	1.24	1.62	1.60	2.18	1.50	1.07	1.70	1.63	1.90
10,000 and over	1.67	1.42	1.60	1.70	2.13	1.67	1.33	1.67	1.80	1.99
	Rural nonfarm					Farm				
Households of 2 or more persons 3/	1.10	1.24	1.43	.63	1.92	1.17	1.54	1.61	.68	1.74
Under 1,000	.42	.97	.91	.32	.98	.70	1.74	1.29	.44	1.82
1-2,000	.65			.42		.98	1.60	1.52	.64	
2-3,000	.94	1.45	1.39	.48	1.82	1.19	1.62	1.55	.82	1.53
3-4,000	1.08	.97	1.31	.75		1.26	1.52	1.53	.74	
4-5,000	1.27	1.24	1.53	.78	1.85	1.58	1.84	1.75	1.12	1.62
5-6,000	1.23	1.09	1.40	1.00		1.47	1.52	1.60	1.06	
6-8,000	1.43	1.57	1.48	1.11	2.99	1.49	1.27	1.73	1.02	2.27
8-10,000	1.93					1.48				
10,000 and over	1.52					2.19				

1/ Based on retail weight data in 1955 Household Food Consumption Survey Reports 1-5 (33). The average used per household from all sources, table 10, was divided by the average household size, table 3.
2/ 1954 family money income after income taxes.
3/ Includes households not reporting income.

Table 4.--Quantity of pork used per person, households of 2 or more persons, by region, urbanization, and income, in a week, spring 1955 1/

Income (dollars) 2/	United States	North-east	North Central Region	South	West	United States	North-east	North Central Region	South	West
	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.
	All urbanizations					Urban				
Households of 2 or more persons 3/	1.14	0.98	1.22	1.25	1.00	1.13	0.95	1.21	1.31	1.01
Under 1,000	1.00	.82	1.18	.99	.94	1.27	.80	1.38	1.32	.68
1-2,000	1.13	.80	1.25	1.19	.83	1.21			1.42	
2-3,000	1.20	.95	1.27	1.33	.84	1.14	.82	1.29	1.36	.70
3-4,000	1.11	.99	1.16	1.22	.98	1.10	.97	1.16	1.22	1.04
4-5,000	1.14	.92	1.19	1.50	.89	1.08	.90	1.18	1.41	.92
5-6,000	1.14	1.06	1.23	1.27	.93	1.13	1.05	1.23	1.25	.97
6-8,000	1.20	1.03	1.32	1.37	1.00	1.19	1.01	1.36	1.30	.99
8-10,000	1.06	.89	1.20	1.06	1.01	1.00	.87	1.08	1.02	1.08
10,000 and over	1.13	.85	1.09	1.17	1.57	1.12	.84	1.08	1.10	1.52
	Rural nonfarm					Farm				
Households of 2 or more persons 3/	1.13	1.02	1.15	1.22	1.00	1.21	1.16	1.34	1.18	.88
Under 1,000	.81	.70	1.14	.80	.96	1.04	1.14	1.07	1.02	1.01
1-2,000	1.01			1.01		1.17	1.03	1.31	1.14	
2-3,000	1.24	1.09	1.16	1.36	.98	1.28	1.39	1.37	1.21	.83
3-4,000	1.10	1.02	1.10	1.18		1.25	1.13	1.30	1.40	
4-5,000	1.24	.95	1.10	1.72	.91	1.26	1.46	1.46	1.11	.64
5-6,000	1.12	1.10	1.15	1.25		1.31	1.19	1.36	1.53	
6-8,000	1.23	1.06	1.17	1.42	1.28	1.21	.89	1.43	1.39	.91
8-10,000	1.11					1.44				
10,000 and over	1.14					1.40				

1/ Based on retail weight data in 1955 Household Food Consumption Survey Reports 1-5 (33). The average used per household from all sources, table 10, was divided by the average household size, table 3.
2/ 1954 family money income after income taxes.
3/ Includes households not reporting income.

Table 5.--Retail value of all meat, beef, and pork used per person and percentage of the United States average, all households, by region and urbanization, in a week, spring 1955 1/

Commodity and urbanization	Value					Percentage of U. S. average				
	United States	North-east	North Central Region	South	West	United States	North-east	North Central Region	South	West
	Dol.	Dol.	Dol.	Dol.	Dol.	Pct.	Pct.	Pct.	Pct.	Pct.
ALL MEAT										
All urbanizations	1.81	2.08	1.99	1.36	2.04	100	115	110	75	113
Urban	2.02	2.18	2.16	1.60	2.08	112	120	119	88	115
Rural nonfarm	1.58	1.79	1.79	1.21	2.09	87	99	99	67	115
Farm	1.44	2.01	1.73	1.06	1.68	80	111	96	59	93
BEEF										
All urbanizations	.76	.90	.89	.47	.97	100	118	117	62	128
Urban	.87	.95	.96	.62	.95	114	125	126	82	125
Rural nonfarm	.62	.74	.78	.34	1.06	82	97	103	45	139
Farm	.60	.94	.79	.36	.82	79	124	104	47	108
PORK										
All urbanizations	.67	.64	.73	.65	.63	100	96	109	97	94
Urban	.69	.63	.76	.71	.64	103	94	113	106	96
Rural nonfarm	.64	.64	.67	.63	.64	96	96	100	94	96
Farm	.61	.70	.69	.55	.48	91	104	103	82	72

1/ Based on value data in 1955 Household Food Consumption Survey Reports 1-5 (33). The average value per household of quantities used from all sources, table 10, was divided by the average household size, table 3. Includes game.

Table 6.--Retail value of all meat, beef, and pork used per person, households of 2 or more persons, by urbanization and income, in a week, spring 1955 1/

Income (dollars) 2/	All meat	Beef	Pork	All meat	Beef	Pork
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
	All urbanizations			Urban		
Households of 2 or more persons 3/	1.81	0.76	0.66	2.01	0.87	0.69
Under 1,000	.98	.33	.47	1.47	.51	.67
1-2,000	1.24	.45	.56	1.42	.51	.60
2-3,000	1.54	.57	.64	1.63	.62	.62
3-4,000	1.63	.66	.62	1.74	.71	.63
4-5,000	1.89	.81	.69	1.95	.83	.67
5-6,000	2.06	.88	.70	2.19	.97	.71
6-8,000	2.16	.95	.76	2.24	1.00	.77
8-10,000	2.21	1.07	.71	2.24	1.07	.70
10,000 and over	2.65	1.27	.81	2.78	1.32	.83
	Rural nonfarm			Farm		
Households of 2 or more persons 3/	1.57	.62	.64	1.43	.60	.61
Under 1,000	.76	.21	.36	.96	.35	.47
1-2,000	1.03	.34	.50	1.27	.50	.57
2-3,000	1.42	.48	.65	1.52	.61	.66
3-4,000	1.47	.57	.59	1.54	.65	.63
4-5,000	1.77	.74	.72	1.73	.80	.64
5-6,000	1.84	.70	.68	1.73	.76	.68
6-8,000	2.06	.84	.80	1.66	.79	.61
8-10,000	2.27	1.20	.77	1.87	.74	.76
10,000 and over	1.96	.98	.71	2.34	1.21	.80

1/ Based on value data in 1955 Household Food Consumption Survey Report 1 (33). The average value per household of quantities used from all sources, table 10, was divided by the average household size, table 3. Includes game.

2/ 1954 family money income after income taxes.

3/ Includes households not reporting income.

Table 7.--Quantity of all purchased meat, pork, and beef used per person in farm households of 2 or more persons, by region and income, in a week, spring 1955 1/

Income (dollars) 2/	United States	Northeast	North Central Region	South	West
	Pounds	Pounds	Pounds	Pounds	Pounds
			All meat		
Households of 2 or more persons 3/	1.37	1.78	1.44	1.19	1.65
Under 1,000	1.10	2.31	1.36	.93	1.90
1-2,000	1.30	1.32	1.59	1.13	
2-3,000	1.45	1.66	1.36	1.46	1.78
3-4,000	1.41	1.42	1.37	1.29	
4-5,000	1.43	2.03	1.45	1.24	1.42
5-6,000	1.80	2.25	1.79	1.75	
6-8,000	1.69	1.95	1.57	1.73	2.00
8-10,000	1.38				
10,000 and over	2.36				
			Pork		
Households of 2 or more persons 3/	.56	.62	.53	.57	.59
Under 1,000	.52	.61	.60	.50	.77
1-2,000	.55	.47	.50	.55	
2-3,000	.62	.72	.54	.64	.62
3-4,000	.57	.54	.54	.61	
4-5,000	.53	.78	.49	.56	.47
5-6,000	.69	.75	.64	.88	
6-8,000	.63	.65	.57	.82	.69
8-10,000	.57				
10,000 and over	.88				
			Beef		
Households of 2 or more persons 3/	.44	.65	.48	.34	.66
Under 1,000	.34	1.13	.47	.23	.66
1-2,000	.40	.48	.57	.33	
2-3,000	.41	.48	.42	.40	.68
3-4,000	.45	.50	.38	.37	
4-5,000	.49	.71	.48	.43	.61
5-6,000	.68	.94	.69	.50	
6-8,000	.62	.66	.51	.60	1.03
8-10,000	.33				
10,000 and over	1.09				

1/ Based on retail weight data in 1955 Household Food Consumption Survey Reports 1-5 (33). The average used per household from purchased source, table 10, was divided by the average household size, table 3. 2/ 1954 family money income after income taxes. 3/ Includes households not reporting income.

Table 8.--Distribution of households and of members of housekeeping families, by region and urbanization, spring 1955 1/

Urbanization	Proportion of households					Proportion of members of housekeeping families 2/				
	United States	North-east	North Central Region	South	West	United States	North-east	North Central Region	South	West
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
	Relative importance of region in United States total									
All urbanizations	100.0	27.7	30.4	30.3	11.6	100.0	27.0	30.1	32.1	10.8
Urban	100.0	32.6	29.5	24.5	13.4	100.0	32.6	29.7	24.8	12.9
Rural nonfarm	100.0	23.8	29.6	37.6	9.0	100.0	23.4	27.9	40.5	8.2
Farm	100.0	9.6	37.6	45.3	7.5	100.0	9.2	36.3	47.2	7.3
	Relative importance of urbanization group in area total									
All urbanizations	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Urban	62.2	73.1	60.3	50.3	72.1	59.2	71.4	58.5	45.8	70.3
Rural nonfarm	26.8	23.1	26.1	33.2	20.9	27.9	24.2	25.9	35.2	21.0
Farm	11.0	3.8	13.6	16.5	7.0	12.9	4.4	15.6	19.0	8.7

1/ Derived from 1955 Household Food Consumption Survey. Based on tables 1 and 2, Survey Reports 1-5 (33).

2/ Based on number and size of the primary economic families. For further explanation, see glossary of the 1955 Household Food Consumption Survey Reports 1-5 (33).

Table 9.--Distribution of households and of members of housekeeping families, in region and urbanization, by income, spring 1955 1/

Urbanization, household size, 1954 income after income taxes (dollars)	Proportion of households in area					Proportion of members of housekeeping families 2/				
	United States	North-east	North Central Region	South	West	United States	North-east	North Central Region	South	West
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
All urbanizations	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
One-person households	8.1	7.8	7.8	8.1	9.7	2.4	2.3	2.3	2.2	3.0
Households of two or more persons - total	91.9	92.2	92.2	91.9	90.3	97.6	97.7	97.7	97.8	97.0
Under 1,000	5.4	2.2	3.4	11.6	1.7	5.1	1.9	2.8	11.2	1.4
1-2,000	8.4	4.8	6.5	14.9	5.5	8.2	4.3	5.3	15.3	4.7
2-3,000	10.8	8.7	8.6	15.2	9.5	11.2	8.4	8.6	17.0	8.7
3-4,000	15.3	16.0	13.4	16.5	15.0	16.8	17.6	14.5	18.4	16.8
4-5,000	15.9	18.2	18.0	11.2	17.1	17.5	20.2	20.1	12.0	19.5
5-6,000	9.6	11.9	10.4	5.9	11.8	10.8	13.2	11.5	6.8	14.6
6-8,000	10.0	11.4	12.8	6.1	9.7	10.9	12.7	14.5	6.3	10.4
8-10,000	3.3	3.3	4.5	1.9	4.4	3.8	4.2	5.0	2.0	4.7
10,000 and over	3.8	3.3	5.5	1.4	6.5	4.2	3.7	6.6	1.3	7.4
Not classified	9.4	12.4	9.1	7.2	9.1	9.1	11.5	8.8	7.5	8.8
Urban	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
One person households	9.1	8.7	7.9	10.4	10.8	2.8	2.7	2.4	3.1	3.5
Households of two or more persons - total	90.9	91.3	92.1	89.6	89.2	97.2	97.3	97.6	96.9	96.5
Under 1,000	2.0	1.2	1.2	4.5	1.6	1.6	.8	.9	3.9	1.1
1-2,000	5.9	3.8	3.7	12.4	3.7	5.4	3.5	2.9	12.2	2.7
2-3,000	9.4	7.7	6.8	15.7	7.9	9.5	7.1	6.6	17.2	7.6
3-4,000	15.0	15.9	12.6	17.8	12.4	16.5	17.4	12.9	20.9	14.3
4-5,000	17.2	18.9	19.2	12.5	17.4	19.3	21.3	21.3	13.7	20.2
5-6,000	10.6	11.4	11.6	7.2	12.7	11.8	12.5	12.4	8.7	14.4
6-8,000	12.0	11.6	15.5	8.6	11.1	13.3	12.9	17.6	9.1	12.0
8-10,000	4.1	3.8	5.4	2.7	4.7	4.8	4.9	5.8	3.3	5.1
10,000 and over	5.0	3.9	7.4	1.9	8.2	5.9	4.4	9.1	1.9	9.7
Not classified	9.7	13.1	8.7	6.3	9.5	9.1	12.5	8.1	6.0	9.4
Rural nonfarm	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
One person households	7.9	5.8	10.2	7.4	7.3	2.2	1.7	3.1	1.9	2.3
Households of two or more persons - total	92.1	94.2	89.8	92.6	92.7	97.8	98.3	96.9	98.1	97.7
Under 1,000	7.5	4.1	4.7	13.7	0	6.3	3.6	3.4	11.0	0
1-2,000	10.7	6.5	8.8	15.3	9.1	10.3	5.4	6.8	15.9	9.0
2-3,000	12.7	11.0	10.0	15.3	15.4	13.9	11.4	9.9	18.3	12.4
3-4,000	17.6	16.2	16.3	18.3	23.6	19.8	17.8	19.5	20.2	24.6
4-5,000	15.5	17.5	17.7	12.0	17.3	16.9	18.9	20.5	13.0	18.4
5-6,000	9.2	14.4	9.4	5.4	10.0	10.9	16.3	11.2	6.3	16.9
6-8,000	7.7	11.7	9.7	3.9	6.4	8.3	12.9	11.0	4.1	6.5
8-10,000	2.0	2.1	3.0	1.1	2.7	2.3	2.3	3.9	1.1	2.8
10,000 and over	1.9	1.4	3.3	1.1	1.8	2.1	1.9	3.9	1.1	1.7
Not classified	7.3	9.3	6.9	6.5	6.4	7.0	7.8	6.8	7.1	5.4
Farm	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
One person households	2.8	2.1	2.7	2.8	5.3	.7	.5	.7	.7	1.4
Households of two or more persons - total	97.2	97.9	97.3	97.2	94.7	99.3	99.5	99.3	99.3	98.6
Under 1,000	19.1	10.4	11.1	29.3	8.0	18.5	9.6	9.1	29.3	6.7
1-2,000	17.4	13.4	14.1	22.0	12.0	16.4	11.5	11.8	21.7	10.7
2-3,000	13.5	15.0	14.1	13.4	8.7	13.5	13.6	14.0	13.9	8.3
3-4,000	11.4	16.6	11.8	9.0	16.6	11.7	18.4	11.7	9.3	18.4
4-5,000	9.4	9.3	13.6	5.1	14.0	10.2	10.0	14.7	6.0	15.7
5-6,000	5.0	5.7	6.9	2.7	8.7	5.9	6.8	8.8	2.7	10.6
6-8,000	4.9	6.2	6.8	2.9	6.0	5.9	8.1	8.3	3.4	7.0
8-10,000	1.9	1.6	2.9	.8	4.7	2.4	2.3	4.0	.7	6.1
10,000 and over	1.1	2.1	1.4	.4	2.7	1.2	1.6	1.7	.4	2.7
Not classified	13.5	17.6	14.6	11.6	13.3	13.6	17.6	15.2	11.9	12.4

1/ Derived from 1955 Household Food Consumption Survey. Data for some income groups are combined in the reports based on the survey because of sampling limitations. Based on tables 1 and 2, Survey Reports 1-5 (33).

2/ Based on number and size of primary economic families. For further explanation, see glossary of Survey Reports 1-5 (33).

Table 10.--Distribution of members of housekeeping families of 2 or more persons in first quarter 1942 and spring 1955, by urbanization and income 1/

Family income in dollars 2/	In first quarter 1942 (income at annual rate)				In spring 1955 (1954 income)			
	United States	Urban	Rural nonfarm	Farm	United States	Urban	Rural nonfarm	Farm
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
All	100.0	57.9	21.9	20.2	100.0	58.9	28.6	12.5
	In current dollars				In current dollars			
Under 500	16.2	2.9	18.2	52.1	5.7	1.8	6.9	21.6
500-1,000	12.6	8.9	19.3	15.8				
1,000-1,500	13.1	11.0	21.4	10.4	9.2	6.[illegible]	11.4	19.1
1,500-2,000	13.5	14.6	15.6	7.8				
2,000-2,500	21.9	16.5	16.0	7.4	12.7	10.8	1[illegible].3	15.8
2,500-3,000		12.8						
3,000-4,000	15.7	22.6	8.0	4.0	19.0	18.8	[illegible]1.8	13.6
4,000-5,000					19.7	21.9	[illegible]3.6	12.0
5,000-6,000	7.0	8.4	1.5	2.5	12.2	13.4	12.0	6.9
6,000-7,000					12.4	15.1	9.1	6.9
7,000-7,500								
7,500-8,000								
8,000-10,000					4.3	[illegible]	2.6	2.8
10,000 and over		2.3			4.8	6.[illegible]	2.3	1.3
	In 1954 dollars				In spring 1942 dollars			
Under 500	18	5	21	55	5	2	7	20
500-1,000					6	3	7	15
1,000-1,500	15	10	25	17	9	[illegible]	12	15
1,500-2,000					13	13	15	12
2,000-2,500	16	15	21	11	33	[illegible]	18	11
2,500-3,000						[illegible]	16	9
3,000-4,000	16	20	15	6	17	20	14	10
4,000-5,000	11	15	8	4	8	10	7	4
5,000-6,000	7	10	4	3	3	4	1	2
6,000-7,000	88	12	3	2	2	2	1	1
7,000-7,500								
7,500-8,000								
8,000-10,000	4	6	2	1.5	1.5	2	1	1
10,000 and over	5	7	1	.5	1.5	2	1	3/

1/ Distribution of family members in current dollars for first quarter 1942 derived from data in Bur. Labor Statis. Bul. 822 Family Spending and Saving in Wartime (25) and for spring 1955 from 1955 Survey Report 1, Food Consumption of Households in the United States (33). Distributions in terms of dollars of other period derived by graphic adjustment of cumulative curve of income-size distribution for change in price level, measured by change in Consumer Price Index. 2/ Net money income in first quarter 1942 at annual rate; disposable money income in 1954. 3/ Negligible.

Appendix A

DATA ON MEAT CONSUMPTION

Two major types of information on meat consumption are available. The first is the annual time series of U. S. civilian meat consumption based on disappearance data. This type of information is called "disappearance" data because the consumption estimates are calculated by adding production, imports, and beginning stocks and subtracting ending stocks, exports, and military takings to determine supplies "disappearing" into civilian distribution channels. They are referred to as time series because they are series of annual aggregates or averages extending over a period of years. The second type of data comes from surveys of household consumption. These are properly described as cross-section data. Sometimes they are called family or household budget data even though they represent actual consumption and not budgeted or planned consumption.

For each set of meat consumption data there are quantity and related value statistics, as described below.

Time-Series Data

Data on the disappearance of meat into civilian consumption are estimated at approximately the wholesale level, in terms of carcass weights excluding offals (hearts, livers, etc.). Production estimates are based on official reports of federally inspected slaughter and voluntary reports on animals slaughtered in other plants and on farms, obtained as part of the regular crop and livestock surveys by the Agricultural Estimates Division, AMS. Net change in stocks of meat held in commercial cold storage warehouses, primarily by packers and wholesale distributors, are taken into account. Also we add the carcass weight equivalents of imported meats, and subtract exports.

The estimates of meat consumption per capita in table 1 include carcass weight equivalents of quantities canned and otherwise processed. Canned meat statistics cover only imported and federally inspected meats. Per capita consumption of such canned meats is reported from time to time in the Livestock and Meat Situation (6) and in table 28 of the annual supplements to Agr. Handb. 62 (3).

Further information on disappearance data is given in Agr. Handb. 62. Its supplements contain revised statistics on the supply and distribution of each major type of meat for each year beginning with 1909. Each issue of the National Food Situation (10) carries current data for the per capita series in terms of primary distribution weights.

Retail weights of meat are estimated from primary distribution data for the entire time series, using the following percentages to derive retail from slaughter weights: Beef, 79; veal, 91; lamb and mutton, 89; pork excluding lard-- lean cuts, 65 and fat cuts, 28. These data are in table 1. The retail weight series are published annually in supplements to Agr. Handb. 62.

Retail value of meat consumed per capita includes the value of home-produced meat as well as all meat sold. The series, reported from time to time in the Livestock and Meat Situation (6), is calculated from the retail weight data just described and weighted average retail store prices for all beef, all pork, veal, and lamb and mutton computed by the Statistical and Historical Research Branch, AMS. The price series for all grades of beef is estimated by taking into account the cost to packers of all live cattle, the packer-wholesale price spreads, and the wholesale-retail price spreads for choice grade meat. Details of this estimation procedure for beef may be found in "Retail Price and Value for All Beef," Livestock and Meat Situation, July 1959 (11). The average retail price for all pork is developed from Bureau of Labor Statistics retail price data for selected cuts using wholesale price relationships among almost all pork products other than lard.

The retail store cost of meat sold by farmers is estimated as part of the statistical work on the farm-retail price spreads for food products and on the marketing bill. These data are described in Misc. Pub. 741 (5, pp. 76-81); current data are given in the supplements to that publication and in the Marketing and Transportation Situation (8). This series differs from the preceding series on retail value of per capita consumption primarily by excluding home-produced and imported meat.

Uses and Limitations of Time-Series Data

Time-series data have been developed for study of (1) changes in average consumption of all meat and of major kinds of meat, and (2) changes in relationships between meat consumption and economic factors such as income and price.

Being overall averages, they tell us nothing about changes in consumption which lie behind the averages, such as variations in consumption by groups within the population and changes in the market structure. Furthermore, they supply no information on variations among population groups in the consumption of major cuts of meat. For such information cross-section data must be used.

Cross-Section Data

Several nationwide surveys of household food consumption provide information on the quantities of each major cut and kind of meat consumed and/or purchased by households grouped according to urbanization, income, area, and sometimes occupation. The major surveys were made in 1935-36, 1942, 1948, 1951, and 1955. Full references to the publications containing the survey, data may be found in the Bibliography.

Problems encountered in using household survey data, and some limitations of data such as those provided by the 1955 survey, are discussed in "Use of 1955 Food Survey Data for Research in Agricultural Economics" (48, pp.

83-87 and 89-91). Additional information may be found in the introduction and appendixes of the several survey reports.

We have found meat consumption data from the 1942, 1948, and 1955 surveys to be the most usable. The spring 1942 survey covered all housekeeping households subdivided by urbanization and income. The 1948 survey collected data only from urban households of 2 or more members. The report on this survey, Agr. Inf. Bul. 132 (28, p. 88), provides a North-South break for broad food groups only. The 1955 survey provided subdivisions into 4 regions, 3 urbanization categories, 1-person households and households of 2 or more, and by income for households of 2 or more persons. Data for average consumption per household for each subgroup indicate significant variations in consumption.

Kinds of Data on Meats

The survey reports contain figures on consumption and purchases for each major cut of each kind of meat in terms of average pounds of products and retail value, and the percentage of households in the group using the item. Some supplementary notes about the meat data from each of these three surveys follow.

Spring 1942.- The pork data in table 26 of Misc. Pub. 550 (23) exclude fat cuts (bacon and salt pork) which are contained in table 27. The "other meat" category of table 26 includes substantial quantities of home-produced and canned beef and pork. Estimates of quantities and values of purchased meats can be derived for rural nonfarm and farm households by subtracting the data on home production given in table 30 from the meat data in tables 26 and 27.

Spring 1948, Urban Only.- Data on purchased meats in table 36 of Agr. Inf. Bul. 132 (28) include pork fat cuts. The statistics on quantity and value of all meats consumed from all sources reported in table 47 are not subdivided by kind or cut. However, for urban households, data on purchased meat by kind and cut (table 36) are a good indication of the subdivisions of meat from all sources. 38/

Spring 1955.- The figures for meat consumed by households in all urbanization categories combined pertain to supplies from all sources and from purchased only, table 10 of Survey Reports 1-5 (33). Urban consumption data are not differentiated according to whether the meat was purchased -- practically all urban supplies are purchased. However, purchases of beef and pork are reported for rural households. Detailed data on purchases of major cuts of beef and pork are included only for farm households. Some additional subdivisions of these rural statistics are available upon request from the

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38/ A special tabulation of urban data from the 1942 survey, excluding one-person households, is reported in Agr. Inf. Bul. 132 (28, p. 104).

U. S. Department of Agriculture. Information on consumption of beef and pork from home-produced supplies is reported for rural nonfarm and farm households in table 22 of Survey Reports 1-5. Related data on home production of meats in calendar year 1954 are given in table 3, Survey Report 12 (33).

Additional Calculations

Several major types of data can be calculated from the published statistics obtained in surveys such as those for spring 1955. These include per person averages, relatives to the U. S. average, shares of the food dollar, shares of the household market, and distributions of the housekeeping population. In calculations combining farm and nonfarm data from the 1955 survey, allowance must be made for the oversampling of the farm segment as described on page 3, Survey Reports 1-5 (33).

Per Person Averages.- Meat consumption averages per person for a week of spring 1955 (and spring 1942) used in this bulletin were derived by dividing the published average quantities used per household by the average household size for each group of households. For the 1955 data, household sizes are given in table 3, Survey Reports 1-5 (33). Average household sizes had been computed by totaling the number of meals served in households in each group and dividing by 21 (48, pp. 87-88).

Such per person averages pertain only to a week's use of food at home in the period of the survey by housekeeping households, whereas per capita averages of the annual disappearance data, discussed above, cover consumption over the whole year by the entire civilian population at home and away from home in eating places of all kinds, including public and private institutions.

Relatives to U. S. Averages.- Percentages of U. S. average consumption, such as shown in figures 8 and 9, compare, in relative terms, per person averages for population subgroups with those for the total population. Use of these relatives simplifies the study of variations in consumption by omitting constant reference to units, time period, and season. However, generalizations from the relationships must be made with reference to the supply and demand conditions at the time of the survey.

Shares of the Food Dollar.- Comparisons of the value of all meat consumed (including that received without direct expense) with the value of all food consumed at home, or comparisons of expenditures for meat purchased with total expenditures for food at home, provide useful indications of the relative importance of meat in the household food picture. However, several pitfalls lie in the path of the unwary researcher. One is the difference between consumption from all sources and from purchased supplies only. Another is the inclusion of alcoholic beverages in the total money value of food at home and the total food expenditures as reported in table 3 of Survey Reports 1-5 (33). (However, separate data on alcoholic beverages are reported in table 20.) A third is the fact that meat data apply only to consumption at

home, but expenditure and money value data reported in table 2 cover food away from home as well as food for consumption at home. Finally, tables 2 and 3 of Survey Reports 1-5 differ because table 2 applies only to the primary economic family, and data for table 3 were developed in terms of members of households eating out of household food supplies. The meat data are on a household basis and match up with the all-food data for home consumption reported in table 3.

Shares of the Market.- The data on regional shares of the U. S. household market for meat, and kinds of meat, such as shown in figure 12, were calculated by making a percentage distribution of U. S. aggregate expenditures for household meat consumption in spring 1955 among the regions. Aggregates may be calculated by multiplying average expenditures per household for each region, table 10 of Survey Reports 1-5, by the number of households in the region, table 1 of the same reports (33). Since the household market accounts for the largest part of the total U. S. meat market, the household survey data provide usable indications of the regional shares of the total meat market.

More detailed measures of this sort can be calculated from the published data, -- e.g., by urbanization group and income class in each region.

Distributions of Family Members.- The distributions of members of housekeeping families in spring 1955, given in tables 8 and 9, were calculated by making a percentage distribution of the aggregate number of persons in housekeeping families among the various population groupings. The aggregate number of persons in the families was derived by multiplying the number of households by the average family size, tables 1 and 2, Survey Reports 1-5 (33). These distributions differ slightly from those which may be calculated in terms of household members rather than family members. Distributions of the household population, based on meals served at home in a week, among sex-age groups in each region, urbanization, and income class are published in table 2 of Survey Reports 6-10 (33).

For many analytical purposes we make use of percentage distributions of members of only those housekeeping families of 2 or more persons which reported their income for 1954. Such distributions may be readily calculated from the data in table 9. They indicate how this population was distributed by size of family income.

Uses and Limitations of Cross-Section Data

At the outset, a word of caution must be given. Analysts using the detailed data from the survey reports must recognize the decreasing degree of reliability for progressively smaller groups of households and less important cuts of meat. Generalizations from such sample data involve

questions of reliability of recall, problems of sampling, and seasonality for some items. These subjects merit much more extensive discussion than can be included here.

Some uses of these cross-section data are indicated by sections II and III of this bulletin, which describe and analyze variations in consumption among groups in the population and the regional market structure for meats in general and for kinds of meat. Additional uses are described in the article by Burk and Lanahan referred to above (48, pp. 93-98).

The major limitations of survey data stem from the fact that they necessarily reflect the demand and supply situation for meats only at the time of the survey. In addition, these data on meat consumption exclude all meat eaten away from home. Among income and urbanization categories, consumption away from home may vary in somewhat different ways from consumption at home.

Appendix B

INFORMATION ON PRICES, INCOME, EXPENDITURES, AND POPULATION

A brief introduction to the vast array of data on prices, income, expenditures, and population is given in this Appendix. Further information is available in publications cited in the Bibliography. In using these data, differences in definition and coverage of individual series through time, and differences between the time-series data and sets of cross-section data, should be observed.

Price Data

The Bureau of Labor Statistics collects urban retail price data and calculates the official Consumer Price Index, published regularly in the Monthly Labor Review (13) and in monthly press releases issued by the Bureau. A monthly report, Retail Food Prices by Cities (14), carries average prices for cities, and indexes. For reference use, the major food subindexes and the CPI are reprinted in the last table of the National Food Situation(10) each quarter. These indexes and the nonfood index are published in table 52 of the annual supplements to Agr. Handb. 62 (3).

Farm price data are collected by the Agricultural Marketing Service. The current information is published in the monthly report, Agricultural Prices (2). Time series of prices received and paid by farmers are summarized annually in Agricultural Statistics (16).

The AMS series on farm and retail value and the marketing cost of the market basket for farm food commodities purchased by urban consumers are published currently in the Marketing and Transportation Situation (8) and summarized in Misc. Pub. 741 and its supplements (5).

Income and Expenditure Data

The National Income Division of the Office of Business Economics, U. S. Department of Commerce, prepares the official estimate of national income and expenditures as part of its work on the national income accounts. The periodic publication on national income, of which the latest edition was entitled U. S. Income and Output (22), contains data for selected years on total and per capita disposable personal income for the United States, regions, and States. The complete per capita series for the United States can be calculated from the published aggregates from this and earlier editions entitled National Income (20). State data on personal income are published in Personal Income by States Since 1929 (1), a supplement to the Survey of Current Business, issued in 1956 but brought to date in the Survey of Current

Business (21) each year, usually the August issue. The Commerce series for the United States on disposable income per capita in current dollars, in 1947-49 dollars, and related indexes (computed by AMS) are published regularly in table 49 of the supplements to Agr. Handb. 62 (3).

Estimates of the distribution of families and unattached individuals by size of income for selected years, 1944-56, are published in U. S. Income and Output, table II-11.

The Agricultural Marketing Service regularly prepares and publishes estimates of farm income for the United States and for individual States. This includes statistics on cash receipts by type of commodity. These data are published regularly in the Farm Income Situation (4).

Time series of U. S. aggregate expenditures by type of product, 1946-57, are published in table II-4 of U. S. Income and Output. The Commerce total personal consumption expenditure series is also published for reference purposes in terms of aggregates and per capita averages in current dollars, 1947-49 dollars, and related indexes (developed by AMS) in table 50 of Agr. Handb. 62.

There are no true expenditure data for meats. This reflects the lack of information on expenditures for meats outside housekeeping households. Without a comprehensive survey of foods served by eating places, it is impossible to estimate the quantities and values of meats served as parts of meals and snacks. However, two sets of value data are frequently used as substitutes for expenditure data. One of these is the retail value of all meat consumed, including home-produced supplies and meats consumed in restaurants and the like. The second is the series on retail cost of domestically produced meats sold to civilian consumers. Both series are described in Appendix A.

For many analyses it is desirable to convert the value data for incomes or expenditures given in current dollars to a constant dollar basis. By making this conversion one may take out the effect of the change in purchasing power of the dollar, insofar as possible. Allowance for change in the purchasing power of the dollar is often made using the Consumer Price Index for the general series on income and the Retail Food Price Index for food. There is much to be said for using the Consumer Price Index as a general deflator for all income and expenditure series, instead of individual price indexes that tend to take out changes in the relationships of prices for individual commodities or groups of commodities to the general price level. In comparing sets of survey data on incomes and expenditures, we have usually found it desirable to adjust the value data by the Consumer Price Index. However, such adjustments for the recent war period merit careful scrutiny because of problems with price indexes during the years of price controls.

Population Data

Most time series on population are based on data developed by the Bureau of Census, the major collector of population data. However, the Agricultural Marketing Service maintains a separate series on farm population. The Agricultural Marketing Service also prepares a series of estimates of the population eating out of civilian food supplies, derived from Census data, and publishes the series annually in table 53 of the supplement to Agr. Handb. 62 (3).

Population data pertinent to the cross-section surveys are regularly published in reports on household surveys of food consumption and expenditures. Urbanization and income-size distributions of members of housekeeping families from the 1942 and 1955 surveys are given in tables 8-10. The method of calculating such distributions is discussed in Appendix A in connection with cross-section data.

Appendix C

USE OF MEAT CONSUMPTION DATA IN ANALYSES

Meat consumption data are used in the study of changes in consumption through time and in the study of variations at one point in time. Research findings presented in this bulletin indicate the desirability of utilizing both time-series and cross-section data in studies of historical changes. 39/ Although no detailed guide to such analysis has yet been published, an operational approach and several types of procedures can be described.

We begin by recognizing the basic fact that changes in meat consumption reflect changes from the supply and the demand sides. Studies of changes in meat supplies and their influences on consumption are reported from time to time in the Livestock and Meat Situation (6). A major statistical study in this area is by Hildreth and Jarrett, A Statistical Study of Livestock Production and Marketing (86). Another major study of both the supply aspects and the demand elements, which relied principally on time-series data, is Working's Demand for Meat (68). These studies, and professional reviews of them, are readily available to research workers.

Both of these publications were written before 1955 -- they did not include analysis based on the 1955 survey. Some guidelines are given here for further research using fairly simple procedures for utilizing both time-series and cross-section data. More detailed guides are in preparation for later publication.

Procedures described are grouped under four topics: (1) Preparation of data for analysis; (2) graphic analysis; (3) alternative combinations of consumption rates and population distributions; and (4) calculations and study of income elasticities.

Preparation of Data

Some phases of preparation of data on meat consumption for analytical use are described in Appendixes A and B. In brief, it is often necessary to convert published household averages to per person averages, to adjust dollar values for changes in price level, to convert poundage data at one level of distribution to equivalents at another -- for example, retail weights back to carcass weights, or to farm value equivalent. Often apparent inconsistencies between two sets of data can be traced to variations in their coverage. An example is encountered in using household survey data, in which nutritionists sometimes prefer to group fat cuts of pork with fats and oils rather than with meats.

39/ Burk and Lanahan article in Agr. Econ. Res. (48), Breimyer and Kause bulletin (41), and Lanahan article in the National Food Situation (57).

Graphic Analysis

To supplement work with statistical data arranged in tabular form, many analysts turn to graphic analysis. We frequently use logarithmic charts of consumption per person for each income class plotted against average income per person of families in that class for each urbanization category of each region. These are called "Engel curves." Graphic analysis often permits the analyst to see the outlines of the forest and to avoid getting lost among the trees of minor aberrations. Charts reveal the systematic variations in consumption data with such factors as purchasing power and degree of urbanization. Sometimes they bring unexpected patterns to light and enable the analyst to study and explain them by referring to other sets of data.

A general guide to the use of graphic analysis in the study of consumption is provided by Graphic Analysis in Agricultural Economics by Frederick V. Waugh (67).

Alternative Combinations of Consumption Rates and Population Distributions

Per person averages of meat consumption by subgroups of households derived from the 1942 and 1955 surveys provide opportunity for analysis of effects of changes in key economic factors -- income, urbanization, and the catchall or residual element which we describe as changes in consumption patterns related to income and urbanization. The familiar procedure of making alternative combinations of values of two or more variables is sometimes described as a reweighting procedure. It encounters some of the problems met in construction of index numbers, that is, applicability and interpretation of fixed weights. Following is an outline of the procedure for working out the possible effect of changes in income on changes in U. S. average consumption of meat from spring 1942 to spring 1955.

The analysis begins with (1) average meat consumption per person in pounds, retail weight, derived from the 1955 survey data and given in table 2; (2) income-size distributions of the housekeeping population in spring 1955 for each urbanization in the United States, derived from data in table 9; (3) income-size distributions for the housekeeping population in spring 1942, converted to distributions in terms of 1954 dollars, table 10; and (4) the urbanization distribution of the housekeeping population in spring 1955 and in spring 1942, table 10.

The first step is the calculation of a weighted U. S. average for 1955 directly from the above data, using 1955 average quantities per person for each income class in each urbanization, the 1955 income-size distributions, and the 1955 urbanization distribution.

The second step consists of calculating an estimated weighted average for 1942, using the 1955 average quantities per person for each income group, the 1942 income-size distributions in terms of 1954 dollars, and the 1955

urbanization distribution. The difference between this average and the 1955 average calculated in step 1 reflects the effect of change in income-size distributions only.

Other combinations of income-size distributions, urbanization distributions, and income-class averages for quantity and value provide materials to challenge the analyst's ingenuity.

Another use of the reweighting procedure is to derive working estimates of consumption in subareas of a region, such as a State or metropolitan area. If one assumes that the consumption average for households of given income and urbanization categories found in the regional surveys are representative of consumption rates of households in the particular State, one can recombine these averages with estimated distributions of the population in the particular State by income class within each urbanization category.

We have found it very important to check such combinations with all available data. For example, we have tested the income and urbanization distributions developed for one State by comparing calculated estimates of the market value of food purchased by consumers with average retail food store sales per person in the State in 1954, and in the region (Census data). If the calculated average for market value of food purchased in the State bears a relationship to the regional average reasonably comparable with the relationship between the State and regional food store sales data, we consider our estimates to be adequate for preliminary analysis.

Income Elasticities

Economists and statisticians frequently calculate income elasticities of quantities and values of food consumed. We have found it desirable in many instances to use simple linear regressions in logarithms of both family income per person and meat consumption per person. We usually compute such regressions for both the time-series and cross-section data and study our results. One does not expect the elasticities to be the same, because changes in supply and consumption patterns through time affect the time-series elasticities and not the cross-section ones. This subject is considered at length in technical bulletins now in preparation and in a statistical article already published. 40/

40/ Burk, Marguerite C. "Some Analyses of Income Food Relationships," Jour. Amer. Stat. Assoc., Dec. 1958 (44, pp. 919-921).

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* U.S. GOVERNMENT PRINTING OFFICE : 1960 O—554724