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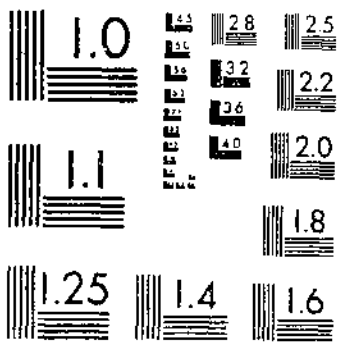

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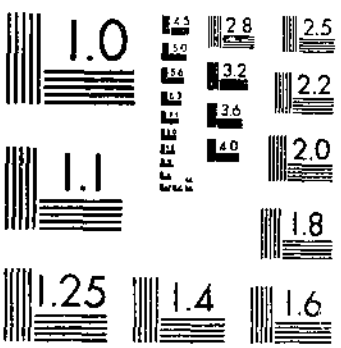

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UNITED STATES DEPARTMENT OF AGRICULTURE
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ECONOMIC FACTORS AFFECTING THE BEEF-CATTLE INDUSTRY OF VIRGINIA

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INTRODUCTION

Methods and practices followed by individual livestock producers in their production and marketing operations are usually determined by local conditions and frequently are not subject to material modification. In some instances there is a tendency to adhere to long-established practices, even though developments elsewhere may have created conditions that necessitate readjustments if operations are to be carried on successfully. Frequently such readjustments need be of a minor character only and can be easily effected.

[1] Much of the material presented in this bulletin was obtained in connection with field studies carried on by the Bureau of Agricultural Economics in cooperation with the Virginia Agricultural Experiment Station and the Animal Husbandry Division of the Bureau of Animal Industry. J. J. Vernon, agricultural economist and C. R. Nobles, animal husbandman, represented the Virginia Agricultural Experiment Station in obtaining records of production methods and costs. Acknowledgment is made of valuable assistance rendered by B. F. McCarthy, W. H. Norris, S. B. Ewing, C. M. Harris, J. A. Burgess, and D. J. Slater, of the Division of Livestock, Meats, and Wool of the Bureau of Agricultural Economics, and by E. A. Seaman of the Pennsylvania State Bureau of Markets, in obtaining marketing and slaughter data on shipments of cattle followed to market. Mr. McCarthy made especially helpful contributions regarding the wholesale beef trade and the demand for beef in New York City. Acknowledgment also is made of helpful cooperation rendered by various members of the livestock and meat trade in New York City, Jersey City, Philadelphia, Lancaster, and Boston, by officials of the Norfolk & Western Railway, and by the many livestock producers in Virginia who furnished data and provided facilities for obtaining records.

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This bulletin presents an economic analysis of the production and marketing methods of beef-cattle raisers in Virginia, together with suggestions as to possible readjustments that might be helpful in putting their industry on a more profitable basis. The analysis deals primarily with the beef-cattle industry of Virginia, but the conditions and recommendations set forth apply equally well to the cattle industry in the other States of the Appalachian Mountain area, since conditions throughout this area in general are similar. The bulletin summarizes material obtained in several economic studies conducted by the Bureau of Agricultural Economics and the Virginia Agricultural Experiment Station. In these studies attention was given to the methods, practices, and costs of producing and marketing beef cattle in the principal cattle-producing sections of the State, the suitability of these cattle for trade demands, the market outlets, the competition that these cattle encounter from the cattle of other producing sections, and such other factors as should be given consideration by Virginia cattle raisers when planning their production and marketing operations.

The information was obtained through interviews with cattle producers, local buyers and shippers, slaughterers and meat distributors, and representatives of railroads and market agencies, and through collecting and analyzing production, marketing, and slaughter data on a large number of beef steers produced in the State.

IMPORTANCE OF GRASS IN THE ECONOMIC PROGRAM OF VIRGINIA CATTLE PRODUCERS

The grazing lands of western Virginia constitute one of the principal agricultural resources of that section, inasmuch as they furnish the raw material for the production of more finished products—beef and lamb: Bluegrass grows luxuriantly on the better limestone soils and provides excellent pasture. Much of this pasture land is too steep to be used for growing grain or cultivated crops. Some of it is too stony to be plowed. Even where it is suitable for general farming many of the owners would not plow it because of the relatively high returns that usually can be obtained from grazing.

Bluegrass pastures, to a certain extent, improve with age. It takes from two to five years after the land is once broken to obtain a well-developed sod. Some of the best pastures are reported to have stood for 50 years or more, and they will sustain as many cattle or sheep, and produce as much increase in weight, as when first established.

Scarcity of farm labor in this section is considered by many as another reason for the utilization of land in pasture rather than in cultivated crops. It is apparent that any farm-management program for this section must take into consideration the most efficient utilization of the available pastures. Grass is the major crop. Cattle serve only as a means for its utilization. Because of the relative scarcity of corn and the abundance of grass most of the cattle from this section are marketed as grass-finished beef. The common practice is to market steers for slaughter at 3 to 5 years of age, when their market weight is 1,250 to 1,500 pounds.

EARLY DEVELOPMENT OF THE BEEF-CATTLE INDUSTRY IN VIRGINIA

The beef-cattle industry has long been of considerable importance in the agriculture of Virginia. The State's early colonization, together with favorable climatic and pasture conditions, afforded the setting for the development of one of the leading beef-cattle producing sections in the early history of this country. Improved breeding cattle from England, largely Shorthorns, were imported, and for years Virginia herds supplied a good proportion of the cattle exported from this country. These export cattle were driven or shipped to the seaboard cities, usually Baltimore, New York, or Philadelphia, where they were loaded on ships for English markets. Bluegrass and "shock" corn produced beef that received favorable recognition on the London markets and competed strongly with the local English product.

RISE AND DECLINE OF UNITED STATES EXPORT TRADE IN CATTLE AND BEEF

Prior to 1870 the export trade of the United States in cattle and beef was relatively small. In the late seventies successful methods were developed for shipping fresh meats under refrigeration. At that time cattle production was expanding at a tremendous rate in the States west of the Mississippi River, where new grazing lands were being opened to settlers. From 1870 to shortly after 1900 exports of live cattle and fresh beef increased rapidly, most of this trade being with Great Britain. The peak of cattle exports was reached in 1904, when the year's total amounted to almost 600,000 head. The peak in exports of fresh beef came in 1901, the total volume for that year amounting to more than 354,000,000 pounds, or the equivalent of more than 500,000 steers.

Just prior to the time that the export trade of this country had reached its peak, refrigeration methods had been perfected sufficiently to make it possible to ship dressed beef from South American countries to England. Since South American beef was being produced at a much lower cost than that in the United States, in a short time it was forcing the United States product off the English markets. Exports of both fresh beef and cattle from the United States declined sharply after 1906, whereas those of chilled and frozen beef from Argentina, the chief producing country of South America, rapidly increased.

Coincident with the decrease in our export trade in cattle and beef came a decline in our cattle production and a gradual rise in cattle prices. By 1912, when cattle numbers had reached the low point in this country, our export trade had almost entirely disappeared, whereas Argentina had obtained practically a monopoly of the English market in chilled beef.

During the World War a tremendous demand for beef for the allied armies developed, but abnormal shipping conditions made it rather difficult to transport supplies from South America. For a time, therefore, the United States again dominated the beef-export trade. The recovery was short-lived, however, for, after the war, when shipping conditions had again returned to normal, Argentina not only regained this trade but increased it to the greatest volume in that country's history.

The United States is now practically on a self-sustaining basis so far as beef production and consumption are concerned. More beef and cattle are imported than exported, but the net imports represent only a small percentage of the total beef consumed. The imports consist mostly of stocker and feeder cattle from Canada and Mexico and canned beef from South America.

The export trade in live cattle undoubtedly was an influential factor in developing the type of steers now commonly produced in Virginia. Ocean freight rates were on a head basis. Heavy steers, after the shrink in weight while being transported from pastures to seaboard, lost only a little more on the ocean voyage, and when slaughtered they dressed out firm carcasses of the type demanded by the English trade. An aged feeder steer of the type available would put on a greater increase in weight on grass alone than would a young animal. All these factors were conducive to the production of heavy, finished cattle, weighing up to 1,650 pounds and averaging from 1,350 to 1,550 pounds at home. Such is the kind now commonly raised in the mountain sections of Virginia and in West Virginia.

CHANGES IN THE BEEF-CATTLE INDUSTRY OF THE UNITED STATES

During the last two decades there has been a transition in the beef-cattle industry in the United States which has developed new problems in production and marketing. From a beef surplus producing Nation with a fairly large export trade, this country, about 1912, found itself temporarily on an import basis and its cattle industry at the low point in a production cycle. Numbers on farms at the beginning of 1912 totaled approximately 55,000,000 head, as compared with more than 64,000,000 in 1904. The high prices of beef and feeder cattle that accompanied this reduction in number brought complaints from both consumers and cattle finishers. A little later came the World War with its increased demands and speculative conditions; this hastened the herd expansion that had begun after 1912. When the war ended in 1918 cattle numbers totaled more than 71,000,000 head, an increase of 16,000,000 over the number in 1912. Shortly afterwards came the most marked price deflation in history, and this deflation with the readjustments it enforced made it impossible for many producers, and difficult for all producers, to continue in business. During the four years, 1921–1924, cattle prices were extremely low as compared with production costs. During this period the cattle industry was generally unprofitable, and financial losses were heavy. From 1922 to near the end of 1926 extensive liquidation took place, cattle numbers were greatly reduced, and many producers left the cattle business entirely.

Price improvement developed gradually in 1925 but was not generally perceptible until late in 1926. During the next two years prices advanced rapidly as slaughter supplies decreased. At the beginning of 1928 cattle numbers were almost to the low point reached in 1912 and were 21.8 per cent, or 15,500,000 head, less than the number on hand in 1918. Although numbers have increased about 3,280,000 head during the last three years, the industry at present is generally on a profitable basis, but, in order to maintain this basis and realize maximum returns, producers must give recognition to changes in demand and in production conditions and must adjust production accordingly. The relative changes in cattle numbers, beef production, and cattle prices from 1900 to 1930 are shown graphically in Figure 1.

During the past 25 years of marked changes in cattle numbers and prices some rather rapid developments have taken place in beef-production methods, particularly in the Corn Belt, where corn is the important feed for finishing cattle for market. In the early part of this period slaughter supplies included a much larger proportion of grass cattle than they have in more recent years. Cattle feeders who followed the practice of intensive feeding with corn usually fed aged steers which were marketed at rather heavy weights. During much of the time beef was relatively low in value, and consumers were accustomed to buying heavy cuts. The so-called "baby beef" (finished yearlings) was more or less a curiosity on the market.

During more recent years cattle feeding in the Corn Belt has passed largely into the hands of experienced feeders—men who are specialists

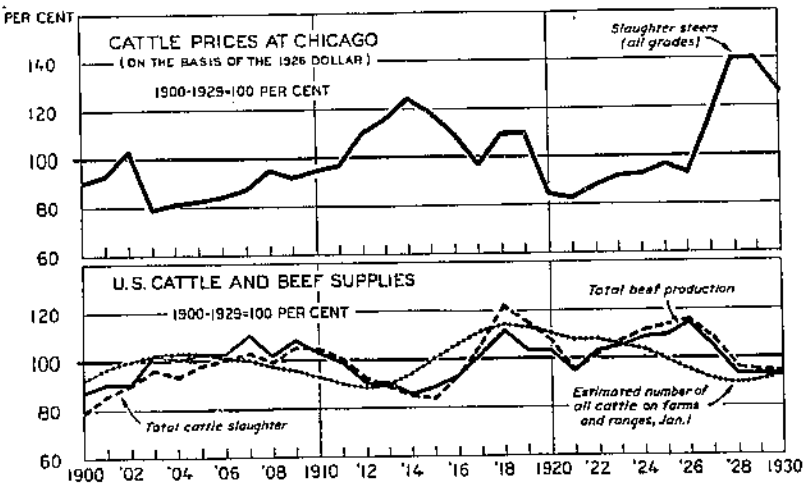

FIGURE 1.—CATTLE NUMBERS, SLAUGHTER, BEEF PRODUCTION, AND PRICES, 1900–1930. EACH SERIES EXPRESSED AS A PERCENTAGE OF ITS AVERAGE FOR 1900–1929

A comparison of the price and production curves shows how the low level of prices from 1919 to 1926 discouraged cattle production; marketings and slaughter exceeded calf crops, and numbers remaining on farms and ranges rapidly declined to the lowest point since 1912. In 1927 and 1928 the production in numbers on farms was reflected by a curtailment in market and slaughter supplies and sharply advancing prices. A similar situation prevailed in the previous production cycle. Increased slaughterings from 1905 to 1911 were followed by a considerable reduction in market supplies and advancing prices before herds were materially increased. The price decline in 1930 was a reflection of reduced consumer demand due to the business depression

in a business that requires considerable skill and judgment. At the same time domestic demand has centered more on grain-finished beef, and particularly on beef that possesses a high degree of tenderness and can be purchased in small cuts without excess waste fat. Beef of this character is usually obtained from early-maturing types of cattle, those producing lightweight carcasses. By shifting to younger and lighter weight cattle the producer and the feeder are not only able to furnish a more desirable product but are often able to make larger profits on their operations.

Beef from heavy, mature cattle that have been well finished now finds its chief outlet in the kosher markets and in the high-class hotel and restaurant trade. The outlet is relatively limited, however, and there is little demand for the lower grades of heavy beef. It is apparent, therefore, that the market for heavy beef can be easily over-

supplied. When this occurs such beef must be offered at reduced prices in order to move it into consumptive channels. Because of consumers' preference for beef from finished grain-fed cattle of the lighter weights, it is becoming more difficult to sell heavy, mature, grass-finished steers on a parity with lighter steers of the same grade, and this fact has created some perplexing problems for Virginia cattle producers.

If the present level of cattle prices eventually results in increased cattle production, as seems likely, lower prices may be expected to follow, and then still greater discrimination will be shown by consumers in making beef purchases. The producer who endeavors to anticipate consumer preferences and is able to readjust his methods so as to produce what is wanted at the lowest cost will be in the best position to continue in the cattle business.

DISTRIBUTION OF BEEF CATTLE IN VIRGINIA

According to the 1925 census Virginia had approximately 680,000 cattle, excluding calves. These were classified about equally as beef cattle and dairy cattle. The estimated number of beef cattle, including calves, totaled 420,000. Some beef cattle are raised in practically every county, but the principal producing sections of the State are the southwest, the Shenandoah Valley, and north Virginia. (Fig. 2.) Twenty-six of the thirty-four counties in these sections contain 72 per cent of the entire number of beef cattle in the State. Russell, Tazewell, Washington, Rockingham, Augusta, and Fauquier are the leading beef-cattle counties. The 17 counties in the southwest section have about 41 per cent of the total in the State, the 8 counties in the Shenandoah Valley 20 per cent, and the 9 counties in north Virginia 17 per cent. The number by classes in each county in these sections is shown in Table 1.

TABLE 1.—*Number of steers, beef cows, and heifers and all cattle on farms in the three principal beef-producing sections of Virginia, January 1, 1925*

Section and county	Steers	Beef cows	Beef heifers	All cattle
North Virginia:	*Number*	*Number*	*Number*	*Number*
Culpeper	2,554	2,999	569	12,724
Fairfax	191	335	123	11,636
Fauquier	10,031	3,341	688	25,618
Greene	909	621	308	5,172
Loudoun	8,432	2,751	733	25,099
Madison	1,941	5,253	687	10,616
Orange	1,198	2,386	469	9,702
Prince William	1,684	1,477	270	9,313
Rappahannock	5,217	787	668	10,628
Total	32,157	19,950	4,665	120,978
Shenandoah Valley:				
Augusta	8,421	7,442	2,760	33,941
Clarke	1,593	2,640	431	6,625
Frederick	816	2,181	501	9,233
Page	1,753	2,079	576	6,365
Rockbridge	3,180	2,742	1,360	15,176
Rockingham	10,470	7,214	3,064	32,890
Shenandoah	2,607	2,146	810	13,295
Warren	1,520	764	371	5,200
Total	30,420	27,208	9,923	122,671

TABLE 1.—*Number of steers, beef cows, and heifers and all cattle on farms in the three principal beef-producing sections of Virginia, January 1, 1925*—Continued

Section and county	Steers	Beef cows	Beef heifers	All cattle
Southwest Virginia:	*Number*	*Number*	*Number*	*Number*
Bland	2,399	2,311	706	7,826
Buchanan	191	955	389	7,200
Carroll	2,436	2,465	1,340	14,273
Dickinson	102	1,104	457	5,625
Floyd	3,248	2,825	1,747	15,195
Giles	2,016	1,761	991	8,967
Grayson	4,536	5,242	2,527	20,438
Lee	5,086	4,042	2,121	18,288
Montgomery	5,908	2,269	921	16,015
Pulaski	4,454	2,000	949	10,859
Russell	10,804	3,425	1,439	22,232
Scott	3,221	4,225	2,058	18,462
Smyth	2,779	1,483	1,202	9,883
Tazewell	9,851	4,043	1,267	19,436
Washington	8,326	4,369	2,502	25,610
Wythe	5,004	2,024	1,831	15,808
Wise	654	372	189	6,027
Total	71,705	44,915	22,648	242,034
Total of three sections	134,282	92,073	37,176	480,583

Figures from Bureau of the Census.

METHODS OF FINISHING STEERS

SOUTHWEST VIRGINIA

In southwest Virginia the production of beef cattle is one of the major agricultural enterprises; about 2,500 carloads of cattle are usually shipped out of that section each year. Most of these cattle are fattened on grass, the usual practice being to carry cattle through the winter on a maintenance ration and fatten for market on bluegrass pasture during the summer. In certain parts of this section the land does not seem well adapted to bluegrass, and the practice there is to produce stocker and feeder cattle, which are usually finished for market in those counties in which grazing and feed conditions are more favorable. The near-by mountain sections in Tennessee, North Carolina, and West Virginia are also sources of feeder steers for the finishers in this section. In many instances these feeder steers are the progeny of cows kept by small farmers for milking purposes. These cows usually show more beef breeding than dairy breeding, being commonly of the red Shorthorn, dual-purpose type. When purchased as feeders for finishing for market the steers usually are from 2 to 4 years of age, mostly 3-year-olds.

Feeder steers are usually obtained in early October and are pastured until about December 1. The length of this fall-grazing period depends on weather conditions and the quantity of grass available. Most operators begin winter feeding only when it is evident that steers are losing weight on grass. If seasonal conditions are favorable, a light ration consisting principally of shock corn and hay is fed, and the steers are kept on pasture until the end of January. In some instances steers are pastured throughout the winter.

A few steers are fed in small feed lots during the winter, but ordinarily they have the run of small pasture lots, or fields, from 5 to 20 acres in size. The most common practice in winter feeding is to feed from 15 to 25 bushels of corn in the shock with some hay and straw. To a more limited extent silage is used in the winter-feed ration. A more detailed discussion of feeding practices appears in

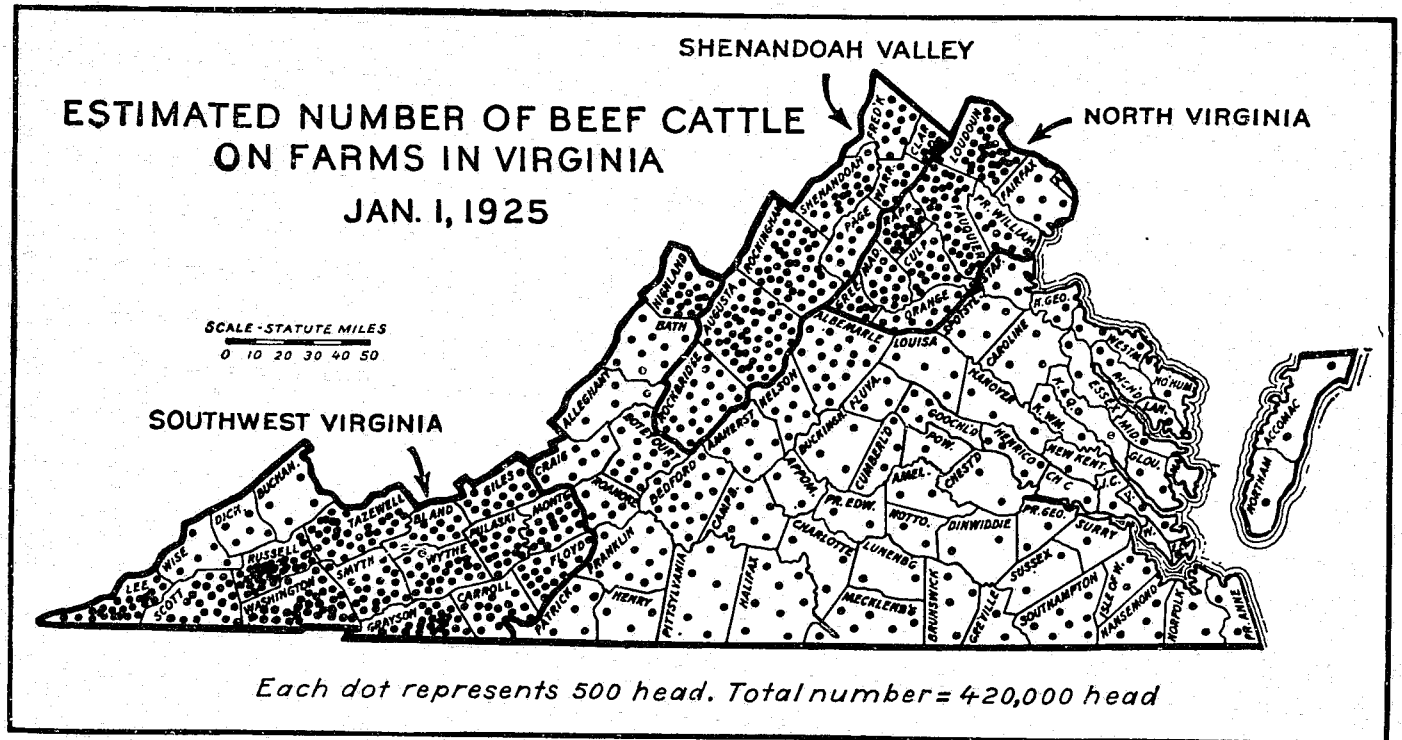

FIGURE 2.—The southwest, the Shenandoah Valley, and north Virginia are the principal beef-producing sections of Virginia. The southwestern section alone has about 41 per cent of the entire number of beef cattle in the State, the Shenandoah Valley has 20 per cent, and north Virginia has 17 per cent

that section of this bulletin that summarizes the results of feeding operations on selected farms of which records were obtained.

Regardless of the method of wintering, the usual practice on all farms is to turn steers on grass about April 20 to May 1, and to finish on grass without additional feed during the pasture season. The grazing season in southwest Virginia ordinarily extends from about April 15 to about December 1, although on some farms pastures are grazed practically throughout the year. Cattlemen in that section as a rule expect to dispose of their grass-finished steers at any time from the latter part of July to early November, depending on grazing and marketing conditions.

SHENANDOAH VALLEY AND NORTH VIRGINIA

In the Shenandoah Valley and in north Virginia the beef-cattle enterprise is much less important than in southwest Virginia. Steers are fattened or fed on only a small percentage of the farms. Most of the farmers depend on a diversified agriculture for their income. Dairy, poultry, or hog production is highly developed on some farms, and income from fruit, truck crops, and wheat is important, especially in some localities.

In the Shenandoah Valley and in north Virginia the more common practice is to fatten cattle for market after the grazing season by feeding shock corn, cottonseed meal or other concentrates, and silage and roughage, for a period of 75 to 110 days. When ready for market the steers carry about the same degree of finish as the so-called "short-fed" or "warmed-up" steers that are marketed in the Corn Belt. The feeding is done in small feed lots, and the steers are marketed from early December to late March.

The finisher may graze the steers through the summer on his own pasture prior to feeding concentrates, or he may purchase them as feeders in the fall just prior to the beginning of feeding operations. Cattle fattened in this section are usually purchased as feeders in the near-by mountain counties of Virginia and West Virginia, although some are obtained from southwest Virginia and western North Carolina.

METHODS OF SELLING CATTLE

Although some of the larger graziers in Virginia ship their cattle to market and there are a few cooperative-shipping associations in the State, the practice among most cattlemen is to sell livestock at home to local buyers who ship to market, or to a representative of a packer located in one of the eastern cities, such as Washington, Baltimore, Philadelphia, New York, or Boston. This packer representative may be a visiting buyer, or he may be a local man who buys on a commission basis, usually about $1 per head. The volume of direct buying varies considerably from year to year, depending largely on supply and demand conditions in the cattle market. If cattle are scarce and the trend of prices is likely to be upward, slaughterers are generally active buyers in the country. On the other hand, if the supply is abundant and the trend of prices is uncertain or likely to be downward they prefer to buy their cattle on the public markets as needed.

The local buyer, whether representing a packer or buying for his own account, is often a large landowner engaged extensively in pro-

ducing or feeding cattle. One or more buyers operating on a large scale are usually located at each county seat. A survey made in 1922 developed that most of the local buyers had had from 15 to 30 years of experience in buying livestock and that much of their success was due to the personal contacts maintained with the producers with whom they had dealings. An intimate acquaintance with producers enables the buyer to keep informed regarding the type of cattle each is feeding and the methods of feeding. In some instances the buyer employs assistants or "spotters" who keep in touch with the farmers and inform him as to when stock is expected to be ready for market.

Buyers as a rule personally inspect every lot of cattle they contemplate purchasing at least once during the feeding or growing period and note about when the animals will be ready for market. When that time arrives, if a contract has not already been made for the cattle, the purchase price can be agreed upon by personal interview or by telephone. The buyer may not see the cattle at the time of sale, but he almost invariably sees them weighed over the scales. Frequently in 1924 when a contract between the buyer and seller could not be arranged, arrangements were made to ship in the buyer's name, the buyer to receive a nominal agent's commission for the service.

Most of the stock intended to be sent to market or direct to a packing plant is purchased by weight, but it is not uncommon to purchase cattle on a head basis. Deliveries are usually made to the nearest available scales. These may be located on the farm of the seller or on that of a neighbor, or they may be located at a mill or store, or at the railroad loading pens. If weighing fees are assessed they are paid by the seller; they may range up to 25 cents per draft or to 2 cents per 100 pounds of live weight.

Shipping days are determined by the time required to reach the market to which shipments are to be made, since all the markets patronized are largely either 1, 2, or 3 day a week markets; that is, trading is carried on most extensively on one, two, or three days each week. The general practice is to time shipments so as to have them reach destination from 24 to 36 hours before the cattle are to be sold, to give the animals ample opportunity to eat and drink freely and thus take on a big fill.

Shipments consigned from southwest Virginia to Jersey City are usually unloaded for feed, water, and rest at Hagerstown, Md., in compliance with the Federal 28-hour law.

BUYING FOR FUTURE DELIVERY, OR CONTRACT BUYING

Contracting for livestock for future delivery has long been a rather common practice with both local and packer buyers who operate in the southern Appalachian and the bluegrass sections of the South. As far as can be ascertained this custom dates back to the Civil War period, and probably further. In the early days when transportation and news-disseminating facilities were exceedingly slow and imperfect, buyers traveled about the country on horseback and to a large extent were the chief sources of market information for producers.

In order that the producer might be assured of an outlet for his cattle when they were ready for sale and that the buyer might get a sufficient volume of business to justify him in making preparations for a trip to market, both found it advantageous to make contracts

in advance of delivery, usually four to six months. As the buyer assumed considerable risk and expense he found it necessary to buy on a rather wide margin. Furthermore, since he was better informed than the producer regarding market values he naturally used his knowledge to his own advantage as far as possible. Later, as transportation and news-disseminating facilities improved and producers became better informed, the buyers' margins were reduced.

During recent years contracts for grass-fed cattle have been made from February to September for delivery at the end of the grazing season, August to November, and contracts for grain-fed cattle have been made from November to March for delivery from January to April. Frequently, contracts for finished cattle are made as soon as the feeder cattle are placed in the feed lots. This enables the farmer or feeder to calculate in advance approximately what he will receive for his feed and labor, since he avoids all risks of shipping and of market fluctuations.

FURNISHING STOCKERS AND FEEDERS ON CONTRACT

Many buyers furnish stocker and feeder cattle on contract. This practice consists in selling cattle suitable for grazing or feeding to the farmer or feeder with a verbal or written agreement to repurchase them by a certain specified date at a specified margin above the initial price per pound. Prior to the World War this margin usually was 1 to 1½ cents; it was increased to 2½ cents during the war and postwar period of high prices because of the increased cost of feed and labor. Later, the margin was reduced to 2 cents, and in more recent years to 1 and 1½ cents. Little difference is made with regard to quality of the cattle when contracting for feeding. Ownership of the cattle during the feeding period is with the farmer. He pays the taxes and stands all losses. In furnishing cattle to the farmer for feeding it is to the local dealer's interest to price them low in order to reduce the cost to him of the increased weight which the animals will take on. A low purchase price is an advantage to the farmer in the event of the loss of an animal.

As an example, assume that a dealer sells a steer weighing 1,100 pounds to a farmer at 6 cents per pound and agrees to buy the finished animal back at 7 cents a pound. An increase in weight of 300 pounds will cost the dealer $21 plus $11 on the original weight, making a total of $32. On the other hand if he sells the steer for 7 cents per pound and buys it back for 8 cents the additional weight will cost him $24 plus $11 on the original weight, or $3 more than under the other agreement.

Under the contract system of buying feeders the farmer endeavors to obtain 2-year-old and 3-year-old steers with large frame and big bone. Such steers usually consume the maximum quantity of feed and roughage and take on a large increase in weight. Calves and yearlings are seldom, if ever, contracted for future delivery.

PRICE DETERMINATION UNDER THE CONTRACT SYSTEM

In determining the price at which to make contracts for future delivery, the local buyer is influenced by his previous experience, by local competition and general business conditions, by information and advice obtained from his commission firm, and to a large extent by the trend of prices at the time the contracts are made.

Competition is very keen among local buyers in many communities. To maintain a satisfactory volume the buyer must work his territory faithfully and keep in close touch with producers lest competitors take business away from him. The most effective way for him to get business and control it is to supply the producers with their stockers and feeders and make an agreement or contract to buy them back when ready for market. The first few trades made usually establish the general price that is paid throughout the entire section during the season.

The local buyer, accustomed to dealing with many different persons, is generally a better bargainer than the producer. He knows the general ability of each farmer to handle and finish cattle and furnishes each with the grades that he thinks can be handled best. The producer with the best reputation as a farmer and feeder gets the best grades of animals to fatten, whereas the farmer of lesser ability is furnished animals of the lower grades.

In bargaining with the buyer the average producer depends almost wholly on such local information as he can get and what he sees in the newspapers as to the current market prices of cattle. The development of radio in broadcasting market information and the educational work being done by State and Federal agencies in marketing and grade standardization is making it easier for the producer to ascertain values, but until he comes in more direct contact with central markets and gives more attention to the study of trade and consumer demands he will continue to be under great disadvantage in his dealings with the buyer.

DISADVANTAGES OF THE CONTRACT SYSTEM

The general attitude of the cattle raisers apparently is to favor contracting. As a class they are rather conservative, and having had little or no experience in shipping to market, they are generally unwilling to assume the risks involved; hence they prefer to sell at home. It is largely because of this attitude that cooperative shipping has never developed extensively in Virginia and that the local buyer has been able to remain in business. Undoubtedly it has tended to keep the contract system in existence.

During the years when cattle prices were low and showed little tendency to advance, most of the buyers who had incurred heavy losses in the deflation period probably would have been in favor of discontinuing the practice entirely, but they felt they had to continue it or their competitors would get the business. Buyers who made contracts at the beginning of the rise in cattle prices in 1927 reaped large profits, and this stimulated contracting in 1928, but profits in the latter year were considerably reduced because the seasonal downturn in prices came earlier than usual.

One disadvantage of the contract system is that it tends to discourage the production of the better grades of cattle. Practically no recognition is given to grade in making contracts for feeding, as the cattle are all fed on practically the same margin. The buyer, in many cases, determines the type of cattle fed, and as the lower grades cost less than the better grades they tend to reduce his risks. At the same time they require less capital for a given number of animals handled. Another criticism that can be made against the practice of contracting, as it is followed, is that it tends to remove the incentive for producers to keep informed as to changes in market demand and to adjust production accordingly.

MARKET OUTLETS

Four public markets are patronized by Virginia livestock shippers: They are located in Richmond, Baltimore, Lancaster, and Jersey City. Public stockyards are located in Philadelphia and in Washington, but little trading is carried on at either of them. They serve principally as receiving yards for livestock billed to slaughterers who operate in those cities. Shippers in southwest Virginia patronize the Jersey City and Lancaster markets most extensively. Those in northern Virginia ship a considerable portion of their stock to Baltimore. This choice of markets is governed largely by the available railroad service, although the character of the demand at these markets is given consideration. The importance of railroads in the choice of markets is discussed elsewhere in this bulletin.

TABLE 2.—*Monthly receipts of cattle at Richmond, Baltimore, Lancaster, and Jersey City, 1925–1929*

RICHMOND

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
1925	2,452	1,204	2,982	2,374	1,937	1,457	1,592	2,627	3,072	3,189	2,910	1,956	27,783
1926	2,237	1,831	1,426	1,040	937	1,247	1,543	1,434	1,921	4,231	2,147	1,935	22,026
1927	2,008	1,744	1,516	1,371	880	540	1,857	1,481	1,825	3,073	1,594	2,053	19,942
1928	1,611	1,709	1,554	910	496	902	1,115	1,547	2,601	1,998	1,659	1,106	17,358
1929	870	975	1,120	1,152	772	944	1,190	1,343	2,601	2,662	1,645	856	15,620
Average	1,836	1,523	1,716	1,369	1,004	1,018	1,459	1,686	2,302	3,030	1,991	1,593	20,546

BALTIMORE

1925	11,869	10,045	11,524	9,599	8,029	7,853	14,677	18,925	22,470	22,628	13,573	11,075	163,107
1926	13,165	8,698	9,400	8,614	10,021	9,566	12,391	11,937	23,015	21,765	14,032	14,890	157,398
1927	13,599	10,087	11,295	11,895	10,320	10,918	15,234	16,482	20,055	19,542	13,380	13,216	166,663
1928	11,405	10,032	10,918	9,112	8,354	7,634	8,407	13,175	18,082	17,153	15,900	11,469	142,241
1929	12,416	9,217	9,663	8,487	8,242	8,220	10,530	13,420	15,586	17,756	11,601	11,711	136,884
Average	12,491	9,609	10,560	9,541	9,175	8,843	12,231	14,786	20,082	19,769	13,698	12,472	153,261

LANCASTER

1925	9,886	4,908	6,061	5,390	7,502	12,812	19,116	35,602	25,644	41,986	29,008	12,004	211,272
1926	10,403	7,559	7,400	6,260	8,415	9,959	17,290	19,357	31,381	43,053	27,868	14,679	203,601
1927	9,922	8,517	7,079	7,654	9,247	11,087	16,154	24,440	31,181	35,453	24,385	12,011	195,136
1928	9,347	7,457	6,815	6,927	9,559	15,971	18,545	25,025	38,202	20,470	22,266	12,774	203,318
1929	7,916	6,138	7,750	8,357	8,857	12,707	18,220	22,340	24,938	30,605	20,474	11,682	180,074
Average	9,500	6,514	7,021	6,918	8,728	12,519	17,866	25,534	30,277	36,113	24,920	12,708	198,080

JERSEY CITY

1925	21,309	18,130	15,374	19,471	16,082	14,586	14,782	21,888	19,116	22,885	14,321	18,976	220,004
1926	14,607	16,870	14,775	16,597	19,318	15,079	12,330	10,694	15,731	17,907	15,203	14,581	189,878
1927	13,878	15,477	12,597	13,724	16,660	11,987	12,774	18,814	19,185	23,742	15,589	14,813	189,240
1928	19,495	15,681	14,814	15,041	20,740	17,780	19,731	17,413	21,050	24,903	19,030	17,837	225,010
1929	23,030	16,493	17,379	22,276	17,401	15,955	20,252	15,534	20,305	22,569	16,898	18,443	227,432
Average	19,264	16,530	14,988	17,622	18,042	15,077	15,975	18,069	19,077	22,420	16,344	16,930	210,315

Monthly receipts of cattle, excluding calves, at these four markets during the five years, 1925–1929, are shown in Table 2. The figures include all cattle unloaded, whether offered for sale, billed direct to packers, or unloaded for feed and water. The shipments direct to packers are an important item in the total receipts at Baltimore and

at Jersey City, being approximately 31 and 68 per cent, respectively, of the totals at these markets during the three years 1922–1924. Cattle received for sale comprised 32 per cent of the total receipts at Jersey City and slightly more than 50 per cent of those at Baltimore during this period. The proportion of cattle for sale is greatest from August to December, approximately one-half of the October receipts at Jersey City comprising shipments for sale.

RICHMOND

The Richmond market is limited as to the number of cattle that can be absorbed by local slaughterers; hence relatively few shipments from southwest Virginia are sent there. Most of the shipments consigned to that market comprise cows and heifers, with a few low-grade steers. The demand for stockers and feeders at Richmond is small, as that market is not adjacent to any well-developed feeding district where large numbers of cattle are finished on concentrates.

BALTIMORE

Baltimore is the principal market for most of the shippers in north Virginia and the Shenandoah Valley. Monday is the most important market day at Baltimore, although considerable trading is done in cattle on Saturdays when a good supply of heavy cattle is available. Many out-of-town slaughterers visit the Baltimore market on Saturday to make purchases for slaughtering the following week if receipts of desirable cattle are sufficiently ample to justify making the trip. Many Virginia shippers prefer to ship their low-grade and lightweight steers to Baltimore because they think it offers a better outlet for such stock than some of the other markets. It also seems to hold favor as a market for cows and heifers; many such cattle come from near-by dairy herds. Stocker and feeder shipments from that market are insignificant, averaging slightly more than 2 per cent of the annual receipts.

LANCASTER

Lancaster's importance as a market for Virginia shippers is due to the fact that it is an outlet for lightweight and unfinished steers, more suitable for feeding than for slaughtering. This market is located in what is known as the Lancaster feeding district, which comprises 16 counties in Pennsylvania and 2 counties in Maryland. The latter are Cecil and Harford. The Pennsylvania counties are Adams, Berks, Bucks, Chester, Cumberland, Dauphin, Delaware, Franklin, Juniata, Lancaster, Lebanon, Lehigh, Montgomery, Perry, Schuylkill, and York. The Pennsylvania Bureau of Markets estimates that the number of cattle fed in this district annually has ranged from 98,000 in 1923 to 132,000 in 1928. The number fed each year depends somewhat on feed conditions in the district (that is, the crops raised prior to feeding), on the financial results of the previous year's feeding, and on the condition of the cattle market at the time feeder cattle are purchased. These feeders are bought from the latter part of July to early December. They usually are bought through commission firms or from dealers at Lancaster who specialize in this class of stock.

A few operators in this district feed from 200 to 600 steers each year, but the majority keep only a few head, the chief objects in feeding being to obtain manure for tobacco fields and to utilize feed,

produced on the farms, which could not be readily sold. The 1925 census figures show 11,457 farms in Lancaster County and, according to the Pennsylvania Bureau of Markets, cattle are fed on about 5,700 of these farms; the average number fed per farm is about 7 head.

There is a great variation among feeders as to the kind of feeder cattle wanted. Some use rather low-grade steers provided they can be bought relatively cheap. Others prefer steers with more finish and quality, even though the cost per pound is considerably greater. As a rule, however, the majority preference is for steers of big bone and big frame, that will consume the maximum quantity of feed and make the greatest increase in weight, the objective being to turn out a fed steer weighing from 1,400 to 1,500 pounds which can be marketed from April to June, inclusive.

Many of the feeder cattle on the Lancaster market are received from Canada and western markets, the St. Paul market being the heaviest of these contributors, with the markets at Chicago, East St. Louis, and Kansas City next in order. Canadian cattle are preferred by many feeders, but the imposition of a tariff of 1½ and 2 cents per pound in 1922 and which was further increased in 1930 has tended to curtail their importations. But cattle from the southern Appalachian sections appear to be gaining in popularity, judging by the increase in receipts from those sections during recent years. This increase is due in part to the danger of loss from hemorrhagic septicemia, or what is commonly called "shipping fever" in shipments from distant markets. Many feeders in the Lancaster district are of the opinion that if Virginia shippers would send better grades of stockers and feeders to the Lancaster market there would be an increased demand there for Virginia cattle.

TABLE 3.—*Car-lot receipts of cattle at Lancaster stockyards, by State or market of origin, 1922–1929*

State or market of origin	1922	1923	1924	1925	1926	1927	1928	1929
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Virginia	1,474	1,385	1,802	1,733	1,607	1,144	1,192	1,218
West Virginia	295	267	309	308	425	243	300	243
Kentucky	86	125	332	60	32	40	49	50
Tennessee	336	262	394	292	146	123	147	127
North Carolina	58	42	63	56	19	13	16	8
Maryland	53	60	47	39	42	33	87	125
Pennsylvania	971	1,106	705	678	676	538	478	223
New York	67	54	74	68	58	71	65	63
Ohio	41	78	63	47	50	60	21	25
Indiana	34	50	62	48	56	30	20	12
Michigan	50	12	8	14	10	2	15	43
Iowa			27	140	56	28	15	11
Texas			29	4	14	14	8	19
Other States		75	23	15	10	56	61	25
St. Paul	1,341	983	988	1,259	1,193	897	802	800
Chicago	962	732	643	759	650	1,035	859	656
East St. Louis	851	352	470	459	288	228	246	190
Kansas City	222	205	166	121	129	169	79	41
Omaha	38	46	6	26	11	9	3	7
Buffalo	142	93	46	69	25	54	104	34
Pittsburgh	97	129	110	32	40	10	30	68
Canada	175	190	162	260	341	1,023	854	633
Total	7,293	6,296	6,589	6,583	5,977	5,728	5,481	4,651

Reports of Pennsylvania Bureau of Markets.

Table 3 shows the State or market origins of all cattle received at Lancaster during the eight years, 1922–1929, as reported by the Pennsylvania Bureau of Markets. Virginia contributed 1,337 cars in 1919, 1,261 cars in 1920, and 1,410 cars in 1921. Of the total of 1,218 cars received from Virginia in 1929, 1,075, or 88 per cent, arrived during the second half of the year. In 1923, receipts from Virginia in the last six months numbered 1,275 cars out of a total of 1,365 for the year, and in 1924, 93 per cent of the total was received in the second six months.

Cattle fed in the Lancaster district are returned to market as fat cattle during the spring and early summer, or during the period when practically no cattle from Virginia are on the market. The majority are first offered for sale on the Lancaster market, although many are shipped to Jersey City and to Baltimore and direct to packers in Philadelphia, Boston, and smaller eastern cities.

JERSEY CITY

Jersey City is the gateway to New York City, and practically all stock received there is slaughtered in the New York metropolitan district, which includes not only greater New York but the near-by cities in New Jersey. Mondays, Wednesdays, and Fridays are the important market days. There is no stocker and feeder outlet at this market, nor is there any other market to which stock can be reconsigned from Jersey City for sale. Virginia shippers as a rule send only their heavy and best-grade steers to Jersey City, as practically all cattle slaughtered in the New York district are koshered and the kosher trade prefers heavy cattle. The importance of the kosher trade in the marketing of Virginia cattle is discussed elsewhere.

Table 4 shows the car receipts of cattle offered for sale at Jersey City during the six years 1922–1927, inclusive, and the number of head received for sale in 1929, grouped according to State origins. The receipts in 1928 were omitted from the table because during part of the year the records were kept by cars, whereas during the remainder of the year they were kept on a head basis. Receipts from Virginia and West Virginia are shown separately, although cattle from these States are similar in general quality. They are produced under almost the same conditions and are marketed in the same season of the year. In considering the composition of the receipts at Jersey City and the relative competition of the different groups of States, Virginia and West Virginia should be grouped together. During the six years 1922–1927 these two States contributed about 43 per cent of the carload shipments of cattle offered for sale at Jersey City. In 1929 they supplied about 35 per cent of the total number of head offered for sale. Receipts from these States fell off sharply after 1925.

Cattle from Kentucky and Tennessee are generally thought by the trade at Jersey City and New York to average somewhat higher in grade than those from the two Virginias, primarily because they are supposed to have been fed more grain. Receipts from these two States are grouped together since they offer about the same kind of competition to cattle from the two Virginias. On the average they represent about 4 per cent of the total receipts for sale.

TABLE 4.—*State origins of cattle received at Jersey City for sale, 1922–1927, and 1929*

State or country of origin	Car-lot receipts								Cattle received 1929
	1922	1923	1924	1925	1926	1927	1922–1927		
							Average	Per cent	
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*		*No.*
Virginia	1,066	1,126	910	1,245	587	707	955	29.4	14,569
West Virginia	641	420	367	530	269	336	429	13.2	5,880
Kentucky, Tennessee	170	77	125	137	116	154	130	4.0	2,393
Pennsylvania, Maryland	476	539	530	574	309	334	460	14.1	3,737
New York, New Jersey, Delaware, Connecticut, Vermont	782	901	876	711	827	1,144	879	27.0	20,619
Illinois, Indiana, Iowa, Missouri, Nebraska, Ohio, Minnesota, Michigan, Kansas	716	426	200	350	285	159	371	11.4	2,522
North Carolina, South Carolina, Alabama, Georgia	19	6	1	4	4	13	8	.2	245
Colorado, Texas, Oklahoma, New Mexico	80	36	0	1	2	0	20	.6	0
Canada	0	0	3	2	0	13	3	.1	56
Total	3,950	3,602	3,102	3,554	2,399	2,920	3,255	100.0	38,961

Receipts from Maryland and Pennsylvania include dairy cows no longer useful for milking and steers that were fed in the Lancaster feeding district. The latter are marketed during the first half of the year, or when few cattle are being received from Virginia and West Virginia. They therefore offer no competition to Virginia grass cattle. Supplies from Maryland and Pennsylvania also showed a sharp reduction after 1925. During the six years 1922–1927 they comprised 14 per cent of the total receipts for sale. In 1929 they represented less than 7 per cent of the total.

Cattle from New York, New Jersey, Delaware, and the New England States comprise mostly cows and bulls from dairy herds. These dairy cattle yield beef of such low grade that they offer but little competition to Virginia cattle. New York furnishes the bulk of the supply, and the total has been increasing in recent years, thus reflecting the growth of the dairy industry.

The receipts of cattle for sale from the Corn Belt or Middle Western States are rather evenly distributed throughout the year. It is believed that as a rule they represent mostly consignments from speculators and traders at mid-western markets who occasionally like to try out the Jersey City market. These receipts from the Corn Belt States furnish the chief competition to cattle from Virginia and West Virginia.

The few cattle received from the Carolinas and other Southern States can not be considered seriously as competitors of Virginia cattle. The same can be said of the small number of shipments received from Texas, Oklahoma, Colorado, and Canada.

TRANSPORTATION SERVICE AS A FACTOR IN MARKET SELECTION

The railroad facilities available to a livestock shipper are usually the most important factor in determining his choice of a market. The railroad that serves him usually provides a service and tariffs that are more favorable to the markets located on its line, or the lines

with which it makes direct connections, than it does to those markets located on competing roads. For instance, southwest Virginia livestock shippers are served by the Norfolk & Western Railway, and its tariffs, train schedules, and reconsigning privileges for shipments originating on it are more favorable for those routed via Hagerstown, Md., where connections are made with the Pennsylvania Railroad to Lancaster and Jersey City, than for those routed via other points. When a shipper on the Norfolk & Western does not care to avail himself of the reconsigning privileges he may find it equally advantagous to ship to Baltimore. Shipments originating on some of the other railroads in Virginia, particularly those serving north Virginia, are entitled to reconsigning privileges at Baltimore which are not accorded to shipments originating on the Norfolk & Western and billed to that market. This accounts in part for the fact that north Virginia sends a greater proportion of its shipments to Baltimore than does the southwest section.

Under the reconsigning privilege livestock may be shipped to a market, and if the offered price is unsatisfactory the stock can be reconsigned to another market for an extra cost, amounting to the differential over the rate to the first market plus a reconsigning charge of $2.70 a car. At Baltimore there is also a housing charge of $3 a car.

If the freight rate from a given loading point to Baltimore is 50 cents per 100 pounds and 53 cents to Jersey City and the shipment is entitled to the reconsigning privilege, the additional cost for reshipping from Baltimore to Jersey City would be 3 cents per 100 pounds plus $5.70 per car. If the shipment is not entitled to the reconsigning privilege the cost of reshipping from Baltimore to Jersey City is 28.5 cents per 100 pounds.

Shipments originating on the Norfolk & Western railroad and billed to Baltimore via the Pennsylvania or the Western Maryland Railway can not be reconsigned to Philadelphia, Lancaster, or Jersey City, as there are no through rates on these roads to these points via Baltimore. From Norfolk & Western stations to Baltimore via the Baltimore & Ohio Railroad shipments may be reconsigned to Philadelphia and Jersey City.

Shipments billed to Lancaster can be rebilled to any point in the Lancaster zone (eastern boundary Bristol, Pa., western boundary Harrisburg, Pa., northern boundary New Boston Junction, Pa., and southern boundary Porter, Del.), at an additional charge per car of $2.70 for diversion. It is not even necessary that the animals be reloaded in the same car in which they arrived. This privilege is particularly important to shippers of stock which may be suitable for feeding, for it applies to what is known as the Lancaster feeding district and enables feeder buyers in that district to move cattle that they have bought on the Lancaster market to feed yards at a small cost.

Shipments reconsigned from Lancaster to Jersey City would carry the diversion charge of $2.70 per car plus a rate differential of 2 to 4 cents per 100 pounds. Shipments reconsigned to Pennsylvania points outside the Lancaster district are subject to the diversion charge of $2.70 per car plus a freight charge varying from $19 to $25 per car.

Shippers find the reconsigning privilege a material advantage, because if the first market proves to be unsatisfactory another can be tried at relatively small additional cost. Furthermore this privilege encourages out-of-town buyers to buy on the Baltimore and Lancaster markets, because they can make use of it in reshipping their purchases to their killing plants or feed yards and effect a saving in freight charges.

MARKET DESTINATIONS OF CATTLE FROM SOUTHWEST VIRGINIA

Records of cattle shipments from southwest Virginia during the three years, 1922–1924, were obtained from the Norfolk & Western Railway which traverses almost the full length of that section and transports practically all of the cattle shipped from it. The bulk of the shipments were from Montgomery, Pulaski, Wythe, Smyth, Washington, Tazewell, and Russell Counties. Table 5 shows the destinations of the shipments, which for the three years numbered about 2,500 cars annually. Greater New York and Philadelphia receive most of the slaughter cattle from this section. Many of the shipments, particularly those to Philadelphia, Boston, and some of the smaller cities, represent shipments direct to slaughterers. A few of the slaughterers in greater New York also at times buy direct from the producers in Virginia. Although the available data will not permit segregating shipments of slaughter cattle from those going to feed lots it appears that from 45 to 60 per cent of the total shipments are sent to slaughter markets and the remainder to various feeding points. The bulk of the latter pass through the Lancaster stockyards. Most of the shipments listed as "miscellaneous" in Pennsylvania were probably first received at Lancaster, as in most instances they represented cattle rebilled to final destinations in the Lancaster feeding district after being sold on that market. About 8 per cent of the total shipments were cattle moving to local points in Virginia for feeding or grazing. The proportion of cattle going to feeder markets during 1923 and 1924, especially the latter year, was much greater than in 1922 and in 1925. This was largely because of the unfavorable price conditions for slaughter cattle during the summer and early fall of 1924.

TABLE 5.—*Destination of cattle shipped from southwest Virginia over the Norfolk & Western Railway, 1922–1924*

Destination	1922	1923	1924	Destination	1922	1923	1924
	Cars	*Cars*	*Cars*		*Cars*	*Cars*	*Cars*
Greater New York	957	852	513	Providence, R. I.	----	8	----
Lancaster, Pa.	631	422	982	Camden, N. J.	----	----	7
Philadelphia, Pa.	397	194	208	District of Columbia	2	3	----
Richmond, Va.	60	72	104	Other points in—			
Baltimore, Md.	23	21	76	Pennsylvania	169	351	188
Reading, Pa.	22	41	25	Virginia	186	194	189
Boston, Mass.	10	37	17	Maryland	14	12	6
Wilmington, Del.	9	19	22	North Carolina	16	15	15
Alexandria, Va.	27	15	7	Tennessee	17	22	20
Frederick, Md.	11	8	5	Other States	13	11	24
Bridgeport, Conn.	6	11	1				
Chester, Pa.	7	7	3	Total	2,575	2,316	2,472

SEASONAL MOVEMENTS OF VIRGINIA CATTLE

The bulk of the Virginia cattle marketed move to market during a comparatively short period each year. The time of this movement and the relative competition which Virginia cattle meet with other producing sections which ship to Jersey City is shown in Figure 3. In this chart it is well to consider the receipts from Virginia with those from West Virginia because of the similarity of conditions under which they are produced and marketed. The chart represents a total of 3,115 cars of cattle, being the average yearly number received for sale at Jersey City during the five years 1923–1927. The Virginia shipments totaled 933 cars or 30 per cent of the yearly average and those from West Virginia 386 cars, or 12.4 per cent. The two States

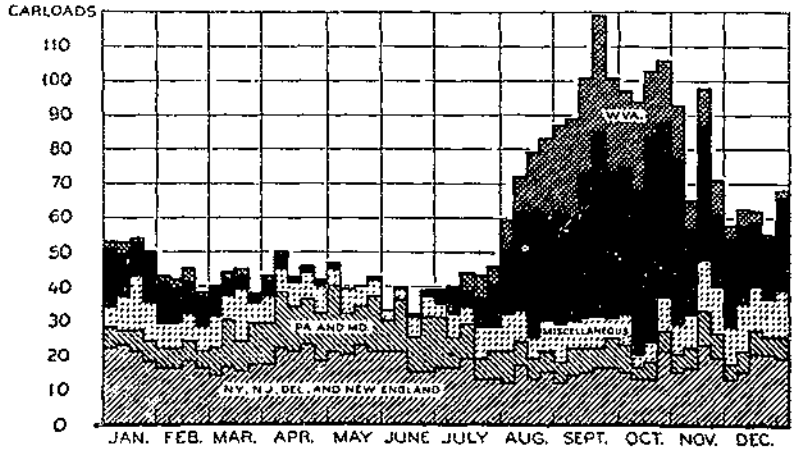

FIGURE 3.—CATTLE RECEIVED FOR SALE AT JERSEY CITY, BY STATE OF ORIGIN, 1923–1927

Virginia contributes 30 per cent of the cattle received at Jersey City for sale and West Virginia 12.4 per cent. Approximately 80 per cent of the yearly shipments of cattle from southwest Virginia move to market from the middle of August to the latter part of November, and these make up a large part of the market supply at Jersey City during this period

combined contributed 42.3 per cent of the average total. Thirteen per cent of the receipts from Virginia and 11 per cent from the two States combined arrived during the period from January 1 to April 8. Marketings during this period represent mostly fed cattle from north Virginia, as practically no shipments are received from southwestern Virginia at this time.

Receipts from the two Virginias between the first week in April and July 1 are insignificant, this being an in-between period following the fed-cattle movement in which grass cattle are not yet ready for market. From March 1 to the middle of July, Pennsylvania and Maryland contribute most heavily to the eastern markets. Some of the shipments from these two States consist of old dairy cows and bulls but most of them are steers fattened in the Lancaster feeding district. Shipments from New York, Delaware, Connecticut, and New Jersey are mostly dairy cows and bulls, and their heaviest movement takes place from April to June, inclusive.

A few Virginia grass cattle are sent to market in July, but the market movement of these cattle as a rule does not reach any substantial

volume before the middle of August. Ordinarily the bulk of the shipments move during September and October, and the season ends the latter part of November. The normal marketing period covers four to five months, but it may be hastened or delayed, depending upon pasture and market conditions. Of the two factors, pasture conditions are the most important.

A prolonged rainy season which results in "washy" grass during the summer prevents the cattle from putting on the hard finish that is desired. When such conditions exist producers hold their cattle on pastures as long as possible, and the marketing period is delayed. A dry summer causes the grass to cure early. This hastens the fattening process and results in early marketing. Dry weather that results in a scarcity of grass also forces early marketing. This condition prevailed in 1925, with the result that more than 60 per cent of the shipments from southwest Virginia that year moved during August and September.

The usual practice of the grazier is to hold back his cattle as long as grass is plentiful in order to obtain the best utilization of the grass and the largest gains in weight during the grazing period. Grass is the major crop, and the cattle serve only as a means of converting it into a salable product. As soon as the steers have taken on the maximum amount of flesh that can be obtained from grazing they are ready for market, and the time of marketing can not be delayed materially without taking considerable risk. The finished cattle therefore, are semiperishable and must be marketed regardless of the market situation. Their perishability is increased somewhat by reason of their age. When they have reached maturity it is impracticable to hold them for further development or finishing after the end of the grazing period. With younger cattle, more latitude in the time of marketing is permitted as they can be retained for a longer period on the farm without material loss.

Of all the cattle received annually for sale at Jersey City, about 64 per cent usually arrive during the last six months of the year, and 37 per cent arrive during the 12 weeks following the middle of August. Virginia's contribution during the 6-month period averages 40 per cent and West Virginia's about 33 per cent of all the cattle on sale during that time. During the 12-week period the two States furnish about 70 per cent of all the cattle on sale. Any surplus or glut on the market at this time, therefore, is caused by the heavy shipments from these two States. The fact that market receipts during these 12 weeks are often greater than can be absorbed except at declining prices is one of the chief marketing problems of Virginia shippers and indicates the desirability of lengthening the marketing period.

Southwest Virginia is the largest contributor of cattle for sale at the Jersey City market during the period when grass cattle are marketed. Table 6 shows the number of cars loaded monthly in this section for all destinations during the four years, 1922–1925. An average of 86 per cent of the shipments moved during the four months, August to November, inclusive. It will be noted that there was some variation in the time of shipping. The 1922 and 1925 seasons were earlier than those of 1923 and 1924. Early marketing is to be recommended as a rule because the best prices for the grades of cattle produced in that section usually prevail during the early

summer. Cattle marketed late are forced into competition with the hordes of grass cattle which move to market from all sections of

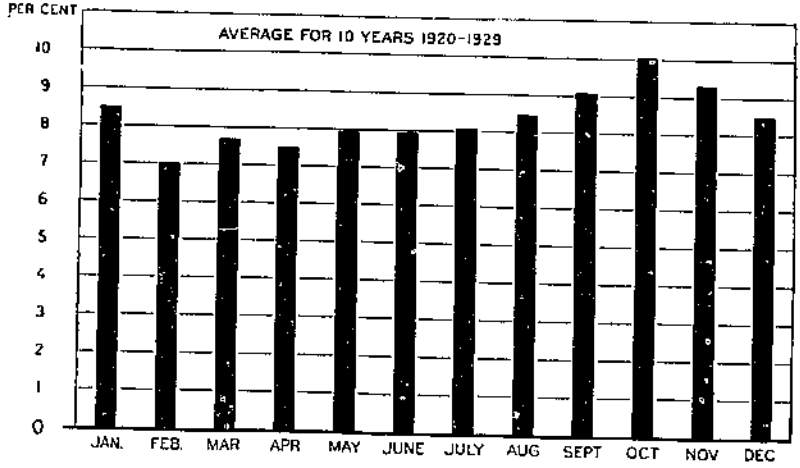

FIGURE 4.—CATTLE SLAUGHTERED UNDER FEDERAL INSPECTION, MONTHLY PERCENTAGE DISTRIBUTION OF AVERAGE YEARLY UNITED STATES TOTAL, 1920–1929

Cattle slaughter increases materially during September, October, and November. During this period Virginia cattle compete with grass cattle from all sections of the country

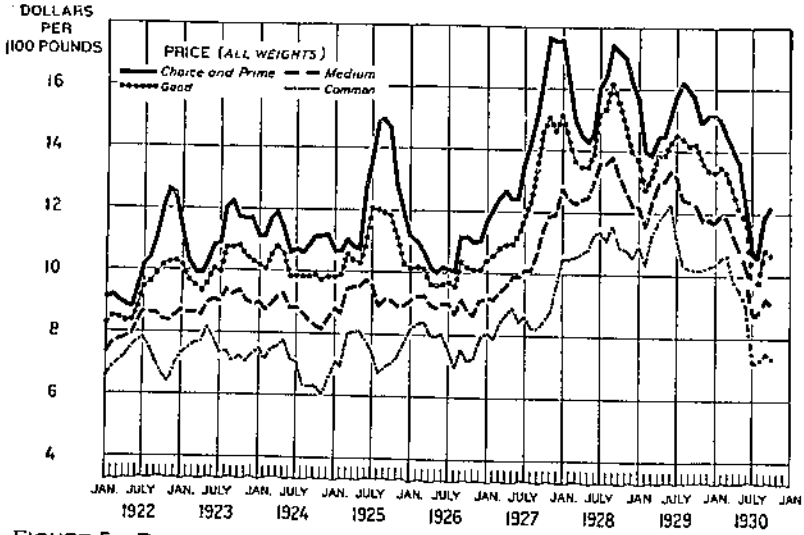

FIGURE 5.—PRICES OF BEEF STEERS SOLD OUT OF FIRST HANDS AT CHICAGO FOR SLAUGHTER (WESTERN STEERS EXCLUDED)

Prices of Choice and Prime steers fluctuate more violently than do prices of the lower grades. The seasonal fluctuations in prices of the different grades are determined to a great extent by the receipts of the different grades. The price of Choice and Prime beef steers is usually the highest in the late summer and fall months, when the supply is the smallest, and lowest in the spring months, when the supply is the greatest. The supply of Common steers is generally heaviest when the supply of Choice and Prime is lightest, and therefore the seasonal variation in the price for the Common is the opposite of the seasonal variation in the prices for Choice and Prime. In general, all grades of beef follow the same trend in prices, with the Medium showing the least fluctuation

the United States. Although many of these grass cattle are returned to feed lots for further finishing, a large number are slaughtered.

Figure 4 shows how slaughterings under Federal inspection increase during the period of the grass-cattle movement. With such greatly increased supplies of cattle of similar quality at this time it is natural to expect market prices for such cattle to decline somewhat. This seasonal decline in prices of grass cattle in the late summer and fall is shown in the prices for common and medium grade steers at Chicago during the years 1922–1926 and 1929. (Fig. 5.) The general rise in all cattle prices in 1927 and 1928, due to the sharp reduction in slaughter supplies, tended to prevent the usual seasonal declines in prices of these grades in those two years.

TABLE 6.—*Car-lot shipments of cattle from southwest Virginia, over the Norfolk & Western Railway, by months, 1922–1925*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
1922	21	12	13	18	72	154	230	352	717	800	143	43	2,575
1923	16	22	13	21	11	15	50	249	540	933	368	77	2,315
1924	26	7	0	15	8	12	49	226	513	906	527	114	2,472
1925	20	12	16	24	10	15	227	780	757	596	87	33	2,577
Average	21	13	13	20	25	49	139	402	632	824	281	67	2,485
Percentage of total	0.8	0.5	0.5	0.8	1.0	2.0	5.6	16.2	25.4	33.2	11.3	2.7	100

PRODUCTION RECORDS OF SELECTED SHIPMENTS OF VIRGINIA CATTLE

To acquire information on grazing and feeding requirements and marketing costs and to ascertain the suitability of Virginia cattle for trade demands, records were obtained of the feeding operations of a large number of graziers in southwest Virginia who expected to market cattle in the summer and fall of 1924. The steers included in the study were then followed through the market and slaughterhouse to the wholesale coolers, and detailed records were obtained on the cost of marketing each shipment. The first of these shipments reached Jersey City on August 17, and the last arrived there about the middle of November.

Complete finishing records for steers grazed in southwest Virginia for the season were obtained on 70 droves, totaling 4,203 head. Complete marketing records covered 52 cars, or 943 head, sold on the Jersey City market. A number of shipments were made direct to packers in Boston, Hoboken, and Philadelphia, but the records were too incomplete for analysis.

Because of their similarity in methods of handling cattle, Shenandoah Valley and north Virginia were considered as one area. In this area feeding records were obtained on 16 droves, totaling 679 steers, which were fed a ration consisting principally of silage and cottonseed meal during the winter of 1924–25. Complete market records were obtained on 18 carloads, or 358 head of these cattle during the period, December, 1924, to March, 1925.

The 86 droves in the two sections on which records were obtained in the summer of 1924 and the winter of 1924–25 were located according to counties as follows: In southwest Virginia—Washington 9, Smyth 19, Wythe 19, Pulaski 22, Montgomery 1; in the Shenandoah Valley and north Virginia—Augusta 4, Rockingham 3, Shenandoah 5, and Fauquier 4.

In 1926 the Virginia Agricultural Experiment Station in cooperation with the Bureau of Animal Industry and Bureau of Agricultural Economics carried on a route study in southwest Virginia to compare different methods of finishing cattle for market. The steers from the farms included in this study also were followed through the market, and marketing records were obtained thereon in a way similar to that in which those in 1924–25 were obtained.[2] These records, while in many cases not so complete as desired, covered a total of 58 carloads, or approximately 1,110 steers.

DESCRIPTION OF FARMS STUDIED

In southwest Virginia one or more droves of steers were finished on grass during the 1924 grazing season by each of the operators of the farms surveyed. The resulting data should not be considered as representative of the agriculture of the section as a whole, but of a particular class of farms. The finishing of steers on grass in this section is confined chiefly to rather large farms. The farms included in the survey ranged in size from 122 to 3,400 acres and averaged about 831 acres. On the smaller farms, few of which were included in this study, livestock production is usually relatively less important than on the farms surveyed. On these smaller farms a much higher proportion of the farm is cultivated, and crop sales are often of considerable importance.

The average size of farm for the different groups and distribution of the farm area are shown in Table 7. An average of about 18 per cent of the farm area was cropped; 64 per cent was pastured, and the rest was in woods not pastured and in waste land. But 12 per cent of the area of farms over 2,000 acres in size was cropped, and about 35 per cent was in woods not pastured and in waste land. On the smaller farms more of the land was cropped, and a smaller proportion was in woods not pastured and in waste land. According to estimates of operators of these farms, about 65 per cent of the total farm area was cultivatable; of this tillable land 72 per cent was in pasture and only 28 per cent in crops in 1923. It was estimated that an average of about 75 per cent of the pasture was cultivatable. Although most of the pastured land was designated as cultivatable and much of it can be easily tilled, considerable land designated as cultivatable is quite rolling and more or less broken and is of doubtful value for producing crops under ordinary conditions.

TABLE 7.—*Distribution of farm area of southwest Virginia livestock farms, by size of farm, 1923*

Acres in farm	Farms	Average size of farm	Crop land	Tillable pasture land	Pasture land not tillable	Woods and waste land
	Number	*Acres*	*Acres*	*Acres*	*Acres*	*Acres*
500 and less	24	357	91	190	49	27
501 to 1,000	27	698	135	361	125	77
1,001 to 2,000	9	1,460	271	738	236	224
Over 2,000	5	2,670	333	865	514	958
All farms	65	831	153	389	142	147

[2] The production phases of this route study are embodied in the following publication: LANGSFORD, E. L., and HUTSON, J. B., SYSTEMS OF BEEF CATTLE FARMING FOR SOUTHWESTERN VIRGINIA. Va. Agr. Expt. Sta. Bul. 258, 47 p., illus. 1927.

On some farms fertile and practically level bottom lands are grazed, whereas on other farms much of the land pastured is rolling to rough, and outcroppings of rock, usually of limestone origin, are conspicuous. Estimates were obtained from the operators of these farms as to the value of pasture land utilized for finishing steers. These estimates indicate that the average value of pasture land on the farms surveyed was about $125 per acre. On some farms the pasture land was valued at as little as $75 per acre; on other farms land pastured by feeders was valued at about $200 per acre. On about 85 per cent of the farms the estimated value ranged from $100 to $150 per acre.

Table 8 shows the number of farms reporting different kinds and classes of livestock and the average number of each kept on farms of different sizes. All of the farms surveyed kept feeder steers, and about half kept other steers. On most farms from 6 to 10 cows, usually of Shorthorn breeding, were kept. Sheep were kept on about 85 per cent of the farms. Usually from 60 to 150 ewes were kept, and the lambs were fattened and sold off grass in June and July. Hogs were kept on practically all farms. On most farms 3 to 8 brood sows were kept, and considerable income was derived from the sale of fat hogs and cured meats not needed for farm consumption.

TABLE 8.—*Livestock grazed on southwest Virginia farms studied during the 1924 season, by size of farm*[1]

Kind and class of livestock	500 acres and less		501 to 1,000 acres		1,001 to 2,000 acres		Over 2,000 acres	
	Farms reporting	Average[2] per farm	Farms reporting	Average[2] per farm	Farms reporting	Average[2] per farm	Farms reporting	Average[2] per farm
	Number	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*
Cattle:								
Feeder steers[3]	23	25.5	27	50.9	9	91.1	5	123.0
Other steers	14	7.3	15	10.6	4	37.8	4	44.0
Cows	23	4.8	25	5.3	8	7.6	4	9.8
Heifers	8	1.3	10	7.9	4	9.4	3	9.4
Calves	14	3.1	15	5.0	5	4.7	3	8.6
Bulls	5	.2	5	.2	5	2.7	2	1.0
Horses:								
Work stock	23	4.7	27	5.4	9	11.4	5	10.2
Other	14	1.4	16	2.3	6	3.7	3	3.2
Sheep:								
Ewes and rams	18	45.2	22	80.9	8	88.3	5	142.0
Lambs	18	48.9	22	89.0	8	89.0	5	137.7
Hogs:								
Brood sows	22	3.8	23	3.5	7	5.8	5	7.2
Other	18	12.3	26	23.9	9	45.3	5	36.0
Poultry, chickens, and turkeys	20	81.7	22	88.1	8	118.2	4	82.2

[1] There were 23 farms of 500 acres and less; 27 of 501 to 1,000 acres; 9 of 1,001 to 2,000 acres; and 5 farms of more than 2,000 acres. One farm of less than 500 acres in size which was included in Table 7 was omitted in calculating the above data because the feeder steers were grazed on hired pasturage.

[2] Averages are for all farms in the size group.

[3] Steers on farm during winter of 1923–24 and sold off grass during the late summer and fall of 1924.

Most of the farms surveyed could be classed as livestock farms. All of the grass, practically all of the hay, straw, stover, corn, and oats and part of the wheat were fed to livestock kept on these farms. On some farms extra feed, especially corn, and protein and mixed concentrates, was purchased. Of the crops produced in 1923 on the farms studied, feeder steers alone were fed 37 per cent of the corn, 20 per cent of the oats, 6 per cent of the wheat, 70 per cent of the corn stover, and 65 per cent of the straw, and, in addition, they con-

sumed 50 to 55 per cent of the grass. All classes of cattle utilized an average of more than 80 per cent of the grass on the farms surveyed. (Table 9.)

TABLE 9.—*Estimated amount of pasturage utilized by different kinds and classes of livestock on southwest Virginia farms studied, by size of farm, 1924 grazing season*[1]

Class of livestock	500 acres and less		501 to 1,000 acres		1,001 to 2,000 acres		Over 2,000 acres	
	Grazing units	Pasture grazed	Grazing units	Pasture grazed	Grazing units	Pasture grazed	Grazing units	Pasture grazed
	Number	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*
Feeder steers	30.6	49.3	71.9	57.6	109.3	52.4	147.0	55.8
Other steers	8.3	13.4	12.1	9.7	43.1	20.6	50.2	19.0
Other cattle	8.1	13.0	16.4	13.1	23.1	11.1	25.2	9.5
Total cattle	47.0	75.7	100.4	80.4	175.5	84.1	223.0	84.3
Horses	4.3	6.9	5.7	4.6	10.8	5.2	9.6	3.7
Sheep	8.8	14.2	15.7	12.6	16.8	8.0	26.8	10.1
Hogs	2.0	3.2	3.0	2.4	5.7	2.7	5.0	1.9
Total	62.1	100.0	124.8	100.0	208.8	100.0	264.4	100.0
	Acres		*Acres*		*Acres*		*Acres*	
Pasture land used	238.7		468.4		974.2		1,379.2	
Pasture per grazing unit[1]	3.8		3.8		4.7		5.2	

[1] By grazing unit is meant the equivalent of the grazing requirements of a beef cow during the grazing season. In the computations in the above table the grazing requirements of different classes of animals expressed in terms of this unit are as follows: Feeder steer 1.2, other steers 1.14, cows 1, heifers 1, calves 0.58, bulls 1.25, work stock 1.25, other horses and colts 1, sheep 0.15, lambs 0.08, brood sows 0.2, and other hogs 0.1. It was estimated that lambs and work stock were pastured during one-half of the grazing season.

The principal crops raised on the farms surveyed were hay, usually timothy and clover, corn, wheat, and oats. Of the crop land an average of 34 per cent was in hay; 28 per cent in corn; 26 per cent in wheat; 5 per cent in oats, and 7 per cent in truck, fruit, and miscellaneous crops. On most farms considerable income was derived from wheat, and some farmers sold some of their best hay. Cash income from other crops was of little importance since truck crops and fruit were produced for sale on but few farms.

The usual grazing season in southwest Virginia is from about April 15 to about December 1, but on some farms pastures are grazed practically throughout the year. Due largely to difference in the fertility of pasture land and to the length of grazing season and quantity of livestock kept, there was a considerable difference in the rate of stocking pastures on the farms surveyed. On the basis of all pasture land, the average amount of pasture land allowed per steer on these farms in 1924 ranged from 4.5 acres on farms 1,000 acres or less in size to about 6.2 acres on farms of over 2,000 acres. Many graziers reserve their best grasslands for finishing steers, the more unproductive pasture land being grazed largely by younger cattle, sheep, and horses. On some farms it was not possible to obtain accurate data relative to the amount of pasture utilized for finishing feeder steers, since steers were pastured either with other livestock or on various pastures. However, 58 of the 70 operators were able to give rather accurate information relative to the acreage of pasture land grazed by feeder steers. On 6 farms less than 3 acres were allowed per feeder steer, on 13 farms from 3 to 3.9 acres, on 17 farms from 4 to 4.9 acres, on 13 farms from 5 to 5.9 acres, and on 9

farms 6 or more acres were allowed per steer. The acreage of pasture allowed varied from 2.2 to 8 acres per steer, and averaged 4.5 acres on the farms surveyed.

Since only a small number of records were obtained on cattle-feeding operations in the Shenandoah Valley and north Virginia and the beef-cattle enterprise is much less important there than in southwest Virginia, no attempt was made to get detailed records of the farms in this section from which shipments were made.

The initial weight, breed, and quality of feeder steers in the droves studied were similar in both sections. Definite information regarding age of feeders when purchased was lacking, but estimates from finishers indicate that the steers were from 2 to 4 years of age and that the majority of animals were long 3s. In both sections late-maturing steers of Shorthorn breeding predominated. There were, however, a considerable number of Angus, Hereford, and crossbred steers and some that showed indications of dairy breeding.

CROP PRODUCTION AND MARKETING CONDITIONS, 1923 AND 1924

Favorable seasonal conditions prevailed in southwest Virginia during 1923, and favorable yields of corn and other crops were obtained. Favorable conditions continued in 1924, and pastures for finishing steers wintered on 1923 crops were uniformly good. In the Shenandoah Valley and north Virginia seasonal conditions in 1924 were somewhat unfavorable for corn. The yield per acre on most farms was much below normal. An extended drought during the early part of the season damaged much of the early corn, and late corn did not mature fully. Much of the corn was soft and otherwise of poor quality. The corn crop throughout the United States in 1924 was much below average in yield and quality and prices for corn were much higher in the winter of 1924–25 than in the preceding winter. Corn was charged to steers in southwest Virginia in the winter of 1923–24 at an average of 90 cents per bushel, whereas in the succeeding winter corn fed to steers in the Shenandoah Valley and north Virginia was charged at an average of $1.12 per bushel. This latter value was about 15 cents per bushel below the market price of good corn, but it was used because most feeders fed considerable corn of poor quality.

The poor corn crop throughout the country in 1924, together with unsatisfactory conditions in the cattle industry, resulted in rather heavy receipts of cattle at the principal markets in the fall of that year. With high prices for corn as a result of the small crop, the demand for feeder steers on the part of Corn Belt feeders was below average, and cattle that ordinarily would go back to the country for further finishing had no other outlet but the slaughterhouse. Under these conditions the cattle market was demoralized that fall, and most southwest Virginia steers which cost about $8 per 100 pounds as feeders in the fall of 1923 brought less than $7.50 at the farm when sold a year later. North Virginia and Shenandoah Valley feeders bought their feeder steers in the fall of 1924 and were able to obtain them at an average cost of about $6.25 per 100 pounds.

METHODS OF COMPILING COSTS AND LIMITATIONS OF COST DATA

In this study farm feeds were charged against steers at prevailing farm values at time of feeding. This farm value was usually computed by deducting the cost of marketing from the market value.

Cottonseed meal and other concentrates purchased were charged to steers at cost. Pasturage was charged to steers at different rates, depending on the quality of pasture. Summer and early fall pasturage was usually charged at prices ranging from $2 to $3 per steer month, and late fall and winter pasturage at from $0.50 to $1 per steer month. The averages of rates at which different items were charged are shown in Table 10.

TABLE 10.—*Averages of rates at which feed and other items were charged or credited in fattening steers, southwest Virginia, 1923–24, and Shenandoah Valley and north Virginia, 1924–25*

Item	Unit	Southwest Virginia, 1923–24	Shenandoah Valley and north Virginia, 1924–25
		Dollars	*Dollars*
Corn	Bushel	0.90	1.12
Other grain and miscellaneous concentrates	Ton	34.00	38.60
Hay	do	17.82	18.02
Stover	do	3.01	2.22
Straw	do	7.16	4.99
Silage	do	6.31	6.98
Summer pasture	Steer month	2.80	----------
Full pasture	do	2.50	1.80
Winter pasture	do	.85	----------
Labor:			
Man	Hour	.175	.175
Horse	do	.125	.125
Credit for:			
Manure	Ton	1.32	1.03
Pork	Pound	.072	.10

Silage as charged includes the field value of corn used and the cost or value of labor, farm power, use of machinery, and other items necessary for filling the silo, together with repairs, depreciation, and interest on the silo.

Man labor was charged to steers at the average cost of this item on farms hiring labor in southwest Virginia in 1924. Information was obtained on southwest Virginia farms as to the amount and kind of labor hired and the cash expense and value of perquisites furnished. Horse work, an item of small importance, was charged at prevailing farm rates. Equipment costs include charges for normal repairs, depreciation, and taxes and a return of 6 per cent on the value of all cattle equipment, including feeder barns, feed lots, fences, wagons, and all other equipment. "All other costs" include taxes, expense for veterinary service, insurance, death loss or risk, and other miscellaneous items. Risk or death loss was of little importance. Death losses in southwest Virginia totaled 23 head out of the 4,226 steers included in the survey. There were no losses from death in the Shenandoah Valley or in north Virginia.

Cost-of-production studies conducted in various beef-cattle finishing sections indicate that there are considerable variations from year to year in the cost of finishing steers. The chief cause of variation, assuming that feeding practices and feeder animals are similar, is usually found in the differences in the cost of feed. Items like man labor and horse work are usually of minor importance and are much less subject to extreme changes in value.

In presenting the data obtained in this study on the cost of grazing and feeding steers the authors are well aware of the limitations of the

data. The data as presented summarize the fiscal results for a specific year, and market returns during the period of the study, particularly for cattle fed in southwest Virginia were very unsatisfactory to the finishers. Furthermore, there are charged to the steers items which can be evaluated only with difficulty. Outstanding examples of these items are pasturage, stover, and straw. Most of the graziers had no other method of marketing these products except as beef, consequently the value of the items depended largely on the demand for them by the graziers themselves.

The amounts of feed, labor, horse work, and other items indicated for the different methods of feeding are believed to be representative of feeding practices in the sections studied; and a fairly accurate estimate of the cost of wintering or fattening steers by the different methods for any specific year can be made by evaluating these requirements at rates prevailing for the various items during the feeding period.

RESULTS OF DIFFERENT METHODS OF WINTERING AND FATTENING STEERS

In southwest Virginia steers were kept on pasture until December 1, or later, depending on weather conditions. About 75 per cent of the steers were wintered on a ration consisting principally of shock corn, hay, and straw. In this bulletin these steers are called "nonsilage" steers. The remaining droves were wintered on silage and lesser quantities of grain and dry roughage and are referred to as "silage" steers. A few of the droves were fed in small feed lots, but these usually had the run of small pasture lots or fields from 5 to 20 acres in size.

The quantity of corn and other feeds fed to steers on different farms varied considerably. Some feeders fed as much as 20 bushels of corn per steer besides other concentrates; others fed mostly hay, corn stover, and straw, and but little grain during the winter period. About April 20, steers were turned on grass and were given no additional feed during the pasture season.

In the Shenandoah Valley and in north Virginia all of the steers on the farms surveyed were fed silage, cottonseed meal, and usually other concentrates and roughage, and were confined in small feed lots during the feeding period. In these sections feeders procured their feeder animals from October to December and usually fed them from 75 to 110 days before marketing them.

Southwest Virginia nonsilage steers were fed an average of about 14 bushels of corn, over 90 pounds of other grain and miscellaneous concentrates, about three-quarters of a ton of hay, approximately the same quantity of stover, and about 700 pounds of straw per steer during the winter period. (Table 11.)

Silage steers on an average were fed about 3,500 pounds of silage per steer and were fed smaller quantities of grain and dry roughage than were fed to nonsilage steers. Pork production was almost in direct proportion to the quantity of corn fed and much less for silage than for nonsilage steers. Manure credits were somewhat higher for silage than for nonsilage steers, as silage steers were confined to a greater extent during the winter feeding period.

TABLE 11.—*Results of different methods of wintering and finishing steers in southwest Virginia, 1923–24 and in north Virginia and Shenandoah Valley, 1924–25*

Item	Unit	Southwest Virginia grass-finished steers, 1923–24, wintered on—				North Virginia and Shenandoah Valley dry-lot steers, 1924–25, finished on silage ration	
		Nonsilage ration		Silage ration			
			Dollars		*Dollars*		*Dollars*
Droves	Number	53		17		16	
Steers sold	do	3,137		1,866		879	
Days on farm	do	372		391		89	
Initial weight per steer	Pounds	1,123		1,124		1,155	
Gain per steer	do	266		309		181	
Daily gain per steer	do	.80		.70		2.03	
Cost per head, of finishing:							
Winter feed—							
Corn	Bushels	13.9	12.52	6.5	5.65	7.4	8.26
Other grains and concentrates	Pounds	89	1.51	18	.33	30	.58
Protein concentrates	do	4	.10	30	.69	336	8.31
Hay	do	1,501	13.17	592	5.88	563	5.67
Corn stover	do	1,665	2.47	1,033	1.61	323	.36
Straw	do	711	2.50	653	2.46	1,172	2.93
Silage	do			3,447	10.88	4,357	15.10
Total cost of winter feed			32.27		27.50		40.67
Pasture:							
Summer	Steer days	171	15.91	186	17.15		
Fall	do	69	5.72	67	5.65	7	.41
Winter	do	36	1.01	25	.70		
Salt	Pounds	20	.35	25	.29	9	.11
Total cost of feed			55.20		51.29		41.19
Man labor	Hours	19.5	3.42	17.8	3.11	10.6	1.85
Horse labor	do	21.6	2.70	12.6	1.57	3.2	.40
Equipment			1.27		1.67		4.77
Interest			5.54		5.79		1.06
Taxes			1.08		1.01		.16
Miscellaneous			.97		.62		.27
Total			70.27		65.06		49.70
Credit for—							
Pork produced	Pounds	21	1.51	7	.49	12	1.18
Manure	do	1,573	1.00	2,003	1.45	6,480	6.26
Total			2.51		1.94		7.44
Net cost of finishing steer			67.76		63.12		42.26
Initial cost			90.52		89.93		73.09
Net cost of finished steer at farm			158.28		153.05		115.35
Sales value at farm			105.28		103.81		111.44
Loss			53.00		49.24		3.91
Initial cost per 100 pounds			8.06		8.00		6.33
Sales price per 100 pounds home weight			7.41		7.24		8.34
Margin [1]			—.65		—.76		2.01
Margin required to cover costs			3.08		2.68		2.30
Cost per 100 pounds gain			22.74		20.43		23.35

[1] Where sales price per 100 pounds at farm was less than purchase price a minus (—) is shown.

There appears to be but little difference in so far as gain or economy of gain is concerned (on the basis of values such as prevailed during the period of the study) between the two methods of wintering steers in southwest Virginia. The slight differences that occur appear to favor the feeding of silage rations in preference to one of grain and dry roughages. The cost of feed, including pasturage, was about $4 less per steer for silage than for nonsilage steers. This amount represents the apparent advantage of a silage ration as compared with a nonsilage ration during the period of the study.

The feeder steers for which records were obtained in north Virginia and in the Shenandoah Valley were similar in quality and weight to southwest Virginia feeder steers. During an average feeding period of about 90 days these steers, while receiving the same quantity of hay and other dry roughage, were fed about 900 pounds more silage, about 1 bushel more corn, and about 300 pounds more protein concentrates per head than were fed to steers wintered on silage in southwest Virginia. Pork and manure production averaged higher and less labor and horse work was expended per steer than in southwest Virginia. Principally because of the low initial cost of feeder steers, the feeding operations for these short-fed steers, although somewhat unsatisfactory, were much less unfavorable than in the southwest Virginia section. The short-fed steers made an average gain of about 2 pounds per steer per day, as compared with about 0.8 pound for steers finished on grass in southwest Virginia. The cost per 100 pounds gain was practically the same for both the dry-lot steers and those finished on grass which were wintered on a nonsilage ration. Feed prices, particularly prices for corn, however, were somewhat higher in the Shenandoah Valley and north Virginia sections than in southwest Virginia.

The average weight of southwest Virginia steers when obtained as feeders was about 1,125 pounds; from 65 to 70 per cent of the droves ranged from 1,100 to 1,200 pounds. Results for southwest Virginia silage and nonsilage steers for different weights are shown in Table 12. Graziers who wintered feeder steers of less than usual weight had a tendency to feed them much less grain and silage during the winter period than was usually fed to heavier steers. Of the nonsilage steers, those weighing from 900 to 1,000 pounds when purchased made the best and most economical gain, and the margin required to pay all costs was appreciably less than for heavier steers. No apparent relationship is indicated between silage steers of different weight in so far as gain, economy of gain, and margin required to pay all costs of the feeding operation are concerned. This is probably because of the small number of droves in some of the weight groups.

In the Shenandoah Valley and north Virginia sections, steers included in the lighter-weight group made the best and cheapest gain, and less margin was required for them than for steers in the heavier group. (Table 13.) Steers in both weight groups were on feed about the same number of days, but the steers in the heavier group were fed considerably more dry roughage and somewhat more grain and concentrates than the lighter steers.

TABLE 12.—*Feed and labor used and cost per steer for wintering and grazing southwest Virginia grass-finished steers, by method used in feeding and by initial group weight of steers, 1923–24*

Item	Unit	Steers fed nonsilage ration				Steers fed silage ration			
		900–1,000 pound	1,001–1,100 pound	1,101–1,200 pound	1,201–1,300 pound	900–1,000 pound	1,001–1,100 pound	1,101–1,200 pound	1,201–1,300 pound
Droves	Number	5	14	31	3	3	3	9	2
Steers sold	do	164	691	1,910	372	94	146	721	105
Days on farm	do	384	390	366	365	358	385	388	438
Initial weight at farm	Pounds	984	1,052	1,141	1,293	949	1,063	1,142	1,232
Gain per steer	do	325	318	206	255	319	320	304	321
Grain:									
Corn (shelled)	do	312	719	1,110	1,015	434	528	488	180
Miscellaneous concentrates	do		232	98	230			36	
Protein concentrates	do			7			55	22	76
Roughage:									
Hay	do	822	1,960	1,471	1,647	760	342	693	87
Other dry roughage	do	3,318	2,112	2,430	2,078	2,172	1,519	1,822	514
Silage	do					3,917	4,414	3,967	6,138
Pasture	Steer days	254	315	263	230	236	271	274	360
Man labor	Hours	15.3	18.4	19.8	21.7	31.3	10.8	17.6	15.7
Horse labor	do	12.0	19.1	21.6	20.6	18.5	8.2	14.0	2.6
Credits:									
Pork	Pounds	4.5	13.0	24.3	23.7	1.6	2.3	9.1	1.3
Manure	do	1,365	1,030	1,137	5,305	2,236	2,259	1,894	2,189
Financial results:									
Initial cost at farm	Dollars	73.74	83.21	92.08	103.50	72.77	83.28	92.54	96.53
Feed cost, including pasturage	do	45.76	55.81	54.77	61.11	47.37	48.35	52.06	53.57
All other costs	do	10.96	14.42	14.88	18.00	15.28	10.86	14.31	12.80
Manure and pork credit	do	.91	1.47	2.47	5.38	1.04	1.33	2.18	1.20
Net cost of finished steer at farm	do	129.55	151.97	150.20	177.23	133.48	141.16	156.73	161.70
Initial cost per 100 pounds	do	7.65	7.91	8.07	8.40	7.67	7.83	8.10	7.84
Sales price per 100 pounds, home weight	do	6.80	7.27	7.42	7.80	7.29	7.30	7.18	7.54
Margin received [1]	do	−.76	−.04	−.65	−.60	−.38	−.53	−.92	−.30
Margin required to pay all costs	do	2.40	3.18	3.01	3.51	2.86	2.33	2.74	2.57
Cost per 100 pounds gain	do	17.17	21.62	22.70	28.91	10.03	17.75	21.12	20.30

[1] Minus (−) means that selling price per 100 pounds was less than cost.

Southwest Virginia graziers usually expect to dispose of their grass-finished steers at any time from the latter part of July until October, depending principally on grazing and marketing conditions. During the year of the study, market conditions were decidedly unfavorable, and feeders held their steers for a longer time than usual, hoping for a stronger market. But steers kept back brought somewhat lower prices than did steers sold earlier. (Table 14.) On an average, steers kept on the farm less than 350 days made the best gain. These steers received more grain but less silage than did steers included in the other groups. The extra expense for keeping steers over the longer period is largely for pasturage, and if the feeder has no alternative use for his grass this item is a doubtful charge under these conditions. It appears, however, that there was no apparent advantage in holding steers over the longer period, for gains were apparently slightly favorable to steers kept on the farm for the shorter period.

TABLE 13.—*Feed and labor used and cost per steer for fattening north Virginia and Shenandoah Valley steers of different weights, 1924–25*

Item	Unit	Steers weighing—	
		1,150 pounds or less	Over 1,150 pounds
Droves	Number	9	7
Steers sold	do	333	346
Days on farm	do	80	91
Initial weight at farm	Pounds	1,101	1,207
Gain per steer	do	200	103
Grain:			
Corn (shelled)	do	386	437
Miscellaneous concentrates	do	13	40
Protein concentrates	do	278	392
Roughage:			
Hay	do	282	834
Other roughage	do	1,631	1,385
Silage	do	4,287	4,424
Pasture	Days	4	10
Man labor	Hours	9.8	11.3
Horse labor	do	2.4	4.0
Credits:			
Pork	Pounds	10.7	13.1
Manure	do	5,766	7,168
Financial results:			
Initial cost at farm	Dollars	69.27	76.76
Feed cost	do	36.09	46.10
All other costs	do	7.25	9.72
Total costs	do	112.61	132.58
Manure and pork credit	do	7.03	7.85
Net cost of finished steer at farm	do	105.58	124.73
Initial cost per 100 pounds	do	6.29	6.36
Sale price per 100 pounds, home weight	do	8.29	8.39
Margin received [1]	do	2.00	2.03
Margin required to pay all costs	do	1.83	2.74
Cost per 100 pounds gain	do	18.16	29.43

[1] Sales price per 100 pounds minus initial cost.

TABLE 14.—*Relative cost and gain of grass-finished steers by number of days kept on farm in southwest Virginia, 1923–24*

Item	Unit	Steers kept less than 350 days		Steers kept 350–399 days		Steers kept 400 days and over	
			Dollars		*Dollars*		*Dollars*
Droves	Number	11		51		8	
Steers sold	do	603		3,123		417	
Days on farm	do	341		378		424	
Initial weight per steer	Pounds	1,130		1,121		1,124	
Gain per steer	do	316		260		314	
Daily gain per steer	do	.93		.78		.74	
Cost per head of finishing:							
Winter feed—							
Corn	Bushels	15.5	13.53	12.4	11.10	3.7	3.92
Miscellaneous concentrates and other grain	Pounds	91	1.53	79	1.40	77	1.36
Hay	do	1,704	13.34	1,218	11.03	999	10.24
Other dry roughage	do	2,139	4.07	2,240	4.97	1,667	4.15
Silage	do	121	.20	745	2.27	3,037	10.38
Salt	do	20	.23	29	.35	20	.34
Pasture	Steer days	250	18.49	272	22.82	344	30.25
Total cost of feed			51.48		54.00		60.64
Net cost of finishing steer			61.99		66.41		74.75
Initial cost per steer			90.61		90.37		89.99
Net cost of finished steer at farm			155.60		156.78		164.74
Initial cost per 100 pounds			8.02		8.06		8.01
Sales price per 100 pounds, home weight			7.81		7.31		7.09
Margin received [1]			−.21		−.75		−.92
Margin required to pay all costs			2.53		3.00		3.45
Cost per 100 pounds gain			19.62		22.44		23.81

[1] Minus (−) means that selling price per 100 pounds was less than initial cost.

The steers fed in north Virginia and in the Shenandoah Valley would be classed as short-fed or "warmed-up" steers at middle-western markets. Four of the 16 droves were fed for less than 75 days, or an average of about 60 days, and the remaining 12 droves were on feed approximately 100 days. Steers kept on the farm for the shorter period, which is not long enough to permit finishing, made much better gain per steer per day and at less cost, and less margin was required to pay all cost than was required for steers fed the longer period. (Table 15.)

TABLE 15.—*Relative cost and gain of grass-finished steers, by number of days kept on farm in north Virginia and Shenandoah Valley, 1924–25*

Item	Unit	Steers kept less than 75 days		Steers kept over 75 days	
			Dollars		*Dollars*
Droves	Number	4		12	
Steers sold	do	142		537	
Days on farm	do	59		97	
Initial weight per steer	Pounds	1,125		1,163	
Gain per steer	do	154		188	
Daily gain per steer	do	2.6		1.9	
Cost per head of finishing:					
Winter feed—					
Corn	Bushels	3.0	4.22	8.5	9.33
Miscellaneous concentrates and other grain	Pounds	24	.45	32	.62
Protein concentrates	do	268	6.27	354	8.84
Hay	do	144	1.43	674	6.04
Other dry roughage	do	1,084	2.71	1,604	3.43
Silage	do	4,137	12.93	4,415	15.75
Salt	do	7	.09	9	.12
Pasture	Steer days			9	.52
Total cost of feed			28.10		44.65
Net cost of finishing steer			29.41		45.65
Initial cost per steer			74.72		72.65
Cost of finished steer at farm			104.13		118.30
Initial cost per 100 pounds			6.64		6.25
Sale price per 100 pounds, home weight			7.94		8.44
Margin received			1.30		2.19
Margin required to pay all costs			1.50		2.51
Cost per 100 pounds gain			19.10		24.28

MARKETING RECORDS OF STEERS FROM SELECTED DROVES

When the steers from the selected droves were shipped to market they were followed from the shipping point through the terminal market, where information was obtained on marketing costs, shrinkage in transit, market fill, and grade and selling price. Table 16 summarizes the information, together with that obtained regarding the cattle marketed from the farms included in the route study in southwest Virginia in 1926. From the terminal market the cattle were followed through the slaughtering plant to the wholesale coolers to obtain information on dressing percentage, grade and color of carcass, and the wholesale value of the final product. Unfortunately it was impossible to get complete resords, particularly slaughtering records, regarding shipments sent to markets other than Jersey City. But the steers sold at Jersey City were fully representative of all the fat cattle marketed from Virginia. Most of the cattle marketed from the farms included in the route study in 1926 were sent to Lancaster. The local representative of the Pennsylvania Bureau

of Markets gave all possible assistance in getting information regarding these cattle, but many of them were sold to butchers and slaughterers who operate on a small scale and keep no records; hence little reliable slaughter information was obtained.

TABLE 16.—*Shrinkage, market fill, and cost of marketing steers shipped from Virginia, 1924–1926*

Item	Unit	Steers from southwest Virginia, summer and fall, 1924			Steers from north Virginia, winter, 1924–25			Steers from southwest Virginia, summer and fall, 1926		
		Per car	Per steer	Per 100 pounds shipping weight	Per car	Per steer	Per 100 pounds shipping weight	Per car	Per steer	Per 100 pounds shipping weight
Shipping weight	Pounds	26,116	1,449		25,063	1,341		25,723	1,280	
Arrival weight	do	23,715	1,308		24,201	1,217		23,473	1,168	
Shrinkage in transit	do	2,401	132	9.2	2,462	124	9.2	2,250	112	8.7
Market fill	do	1,163	64		1,340	67		920	46	
Selling weight	do	24,878	1,372		25,541	1,284		24,393	1,214	
Net shrinkage	do	1,238	68	4.7	1,122	57	4.2	1,330	66	5.2
Time in transit	Hours	64						[1] 53		
Time held in yards	do	38			49			[1] 40		
Marketing costs:										
En route—										
Bedding	Dollars	1.30			[2] 2.04			(3)		
Freight	do	128.12			100.25			122.66		
Feed	do	3.96			4.96			4.05		
Total	do	133.38	7.35	.51	107.25	5.39	.40	126.71	6.31	.49
At terminal market—										
Hay	do	[4] 20.14	1.11	.07	[4] 20.11	1.01	.08	12.12	.60	.05
Commission	do	22.67	1.25	.09	24.86	1.25	.09	24.89	1.25	.10
Yardage	do	7.25	.40	.03	7.96	.40	.03	3.01	.15	.01
Fire insurance	do	.20	.01		.20	.01		.15		
Total	do	50.26	2.77	.19	53.13	2.67	.20	40.17	2.00	.16
Shrinkage [5]	do	102.45	5.65	.40	103.24	5.19	.39	118.12	5.88	.46
Total costs:										
Excluding shrinkage	do	183.64	10.12	.70	160.38	8.06	.60	166.88	8.31	.65
Including shrinkage	do	286.09	15.77	1.10	263.62	13.25	.99	285.00	14.19	1.11

[1] Based on all lots having complete data.
[2] Includes long-distance telephone calls and reconsignment charges incurred on shipments reconsigned from Baltimore.
[3] Included with freight charges.
[4] Cost of 959 pounds, average amount fed per car.
[5] Combined cost of 772 pounds of hay and 2.3 bushels of corn; average amount fed per car.
[6] Home weight minus sales weight times prices.

GRASS-FINISHED STEERS FROM SOUTHWEST VIRGINIA IN 1924

Data presented in Table 16 on steers shipped in the summer and fall of 1924 are based on the averages for 52 cars, or 943 steers, that sold for an average of $8.28 per 100 pounds. The time in transit to Jersey City was 64 hours, including a stop-over for feed, water, and rest at Hagerstown, Md. The cattle, on an average, remained in the yards 38 hours before they were weighed to the buyer. The range in average selling weights by carloads was from 1,241 to 1,471 pounds per head, and the amount available for sale out of the original 100 pounds loaded ranged from 93.4 to 98.2 pounds. The net shrinkage for the individual cars varied from 1.8 to 6.6 pounds per 100 pounds shipping weight, but the average of 4.7 pounds is typical. In some cases excessive market fills were reported, thus affecting the net shrinkage to some extent. The market fill per steer varied

from 34 to 107 pounds per head, depending somewhat on the time in the yards and the weight of the steer. The gross shrinkage in transit varied from 6.6 to 12.2 pounds per 100 pounds shipping weight, but the average of 9.2 pounds is typical of the major portion of the cars followed through the Jersey City market. The freight rate ranged from 53 to 55½ cents per 100 pounds arrival weight, with a minimum weight of 22,000 pounds for cars 36 feet 7 inches and under.

Although loss in weight or shrinkage in transit can hardly be included as a cost item in marketing since, on the average, proper allowance is made for it by buyer and seller, it must be given consideration by the shipper, particularly if it proves to be above average on individual shipments. If shrinkage is considered a marketing expense it represents the second largest item in marketing cattle from southwest Virginia to Jersey City. In computing the allowance for shrinkage it is assumed that the animal would sell for the same price per 100 pounds regardless of the amount of shrinkage, but this is hardly to be expected. Shrinkage cost as computed is subject to considerable variation because of variations in the market value of the animal. With no change in the rate of shrinkage, the higher the value of the animal the higher the shrinkage cost would be.

With higher cattle prices, such as prevailed in 1928 and 1929, marketing costs would be increased proportionally if the item of shrinkage is considered as a cost of shipping. Excluding shrinkage, most of the marketing charges are subject to little variation, especially freight, commission, and yardage charges. Feed charges have more variation, mainly because of the length of time cattle are held in the stockyards before being sold. Charges for feed at the terminal market in 1924 varied from $5.60 to $44.57 per car. Shrinkage cost is subject to the widest variation, because of the variations in both the amount of net shrinkage and the value placed on it. The shrinkage charges for the 52 cars studied ranged from $39.10 to $151.30 per car. The total marketing charges per 100 pounds shipping weight varied from 92 cents to $1.27 for the different cars. The total charges on 30 per cent of the cars varied from $1.10 to $1.15 per 100 pounds shipping weight.

FED CATTLE FROM NORTH VIRGINIA, 1924–25

Market records were obtained on 18 carloads or 358 head of fed cattle shipped from the Shenandoah Valley and north Virginia to Jersey City in the winter of 1924–25. The averages shown on these cattle may not be as representative of actual conditions as they would be if they included a larger number of shipments, but they check closely with the information obtained on southwest Virginia cattle.

Cars from the north Virginia section were loaded somewhat heavier, both as to weight and number of cattle, than were those from southwest Virginia. They averaged about 20 steers per car, and the average weight per car was 26,663 pounds at shipping point. Shrinkage in transit was slightly less per head than the shrinkage on the cattle from southwest Virginia but since the north Virginia cattle were about 100 pounds lighter per head, the shrinkage per 100 pounds shipping weight was the same, 9.2 pounds. The north Virginia cattle took on a much larger market fill, thus reducing the net shrinkage to 4.2 pounds per 100 pounds shipping weight as compared with the 4.7 pounds on the cattle from southwest Virginia.

Approximately one-half of the shipments were reconsigned from Baltimore, and in several cases they had heavy feed charges at that market. A few shipments carried charges for feeding in transit at Baltimore. The charge for feed en route, $4.96, is an average of the feed charges for all shipments and is subject to considerable variation according to whether the cattle are fed in transit and whether they are offered for sale at Baltimore before being sent on to Jersey City. Charges listed under bedding include besides bedding costs such items as telephone calls and reconsignment charges. The two latter items need not be incurred unless the shipper feels that a higher price can be obtained by reconsigning.

As terminal marketing costs are largely on a head basis at Jersey City there is little variation in these costs for cattle from different sections. With a larger number of cattle per car in the shipments from north Virginia the terminal charges on a carload basis were somewhat higher than those on the southwest Virginia cattle. The feed charges per car were practically the same, so the average feed charge per head was slightly less than for the southwest Virginia cattle. The average feed consumed per car was 772 pounds of hay and 2.3 bushels of corn. Feed charges at Jersey City at the time these shipments were marketed were $2 per 100 pounds for hay and $2 per bushel for corn. The net shrinkage of north Virginia cattle was less than that of the cattle from southwest Virginia, but their average selling price was $9.20 per 100 pounds, as compared with $8.28 for the latter. The lower shrinkage of the north Virginia cattle was balanced therefore by a somewhat higher selling price, making the shrinkage charges in either case about the same.

STEERS MARKETED AT LANCASTER FROM SOUTHWEST VIRGINIA IN 1926

Fifty-eight cars were followed from farm to market in 1926, practically all the shipments being consigned to Lancaster, but complete records were obtained on only 11 cars. The steers in these 11 cars were of lighter weight than those marketed at Jersey City in 1924 and 1925. This was to be expected in view of the common practice in southwest Virginia of marketing the lighter cattle at Lancaster, where there is a feeder demand as well as a slaughter outlet. With an average of 20.1 steers per car, the average shipping weight was 25,723 pounds per car, or 1,280 pounds per head. Average gross shrinkage in transit amounted to 2,250 pounds per car, or 112 pounds per head. Expressed as a percentage of the shipping weight, this amounted to 8.7 per cent, or 0.5 per cent less than the gross shrinkage on the shipments made in 1924–25. The market fill on these steers was considerably less than that on those shipped in 1924–25, amounting to only 3.9 per cent of the arrival weight, as compared with 4.9 per cent on the steers shipped from southwest Virginia in 1924 and 5.5 per cent on those shipped from north Virginia in 1924–25.

Net shrinkage on the cattle going to Lancaster was slightly greater than that on those going to Jersey City in 1924–25, largely because of the smaller fill obtained. The cattle shipped to Lancaster were in transit an average of 55 hours, as compared with 64 hours for those going to Jersey City. After arrival at Lancaster the steers were held in the yards 40 hours before sale was made. At Jersey City this time averaged 38 hours.

Total shipping costs to Lancaster were almost 2 cents per 100 pounds less than the cost of shipping to Jersey City. Terminal-market costs at Lancaster were slightly lower than those at Jersey City. Commission charges were the same at both markets, being $1.25 per head. Yardage charges at Lancaster were 15 cents a head, as compared with 40 cents at Jersey City. Total feed costs at Lancaster were only about 60 per cent of those at Jersey City. This was due largely to the fact that smaller quantities of hay were fed although unit costs were also slightly lower.

Without making any allowance for shrinkage, the total cost of marketing cattle from southwest Virginia at Lancaster was 65 cents per 100 pounds shipping weight, as compared with 70 cents for those sold at Jersey City. Applying the selling value of the cattle to the net shrinkage in weight and considering net shrinkage as a market cost, the total average marketing cost was increased to $1.11, which is practically the same as the total average cost of marketing at Jersey City in 1924. When including shrinkage, the comparative cost figures are not exactly comparable because the level of cattle prices in 1926 was higher than in 1924. After the 1924 selling price of cattle at Jersey City has been adjusted to the 1926 level, which amounted to an increase of 6.7 per cent, the average total cost of marketing cattle at Jersey City amounts to $1.12 per 100 pounds of shipping weights, as compared with an average total cost of $1.11 at Lancaster.

SLAUGHTER INFORMATION REGARDING CATTLE FOLLOWED TO MARKET

After the selected lots of cattle marketed in 1924 and 1925 were sold at Jersey City, they were followed through the slaughter plants to the wholesale coolers, and information was obtained regarding the yield and general quality of the beef produced. In this phase of the study, information was obtained regarding the length of time the cattle were held by the buyer before slaughter, the dressing percentage, grade and selling price of carcass, number or percentage of dark-cutting carcasses, and yield and grade of hide. Because of the difficulty of maintaining the identity of the various lots through the slaughterhouse; complete records were obtained on only 73 cars, or 1,337 head, of southwest Virginia cattle, and 22 cars, or 437 head, of north Virginia cattle.

Southwest Virginia steers dressed on an average 56.32 per cent of their selling weight. In other words, a steer of the average weight, 1,372 pounds, produced a carcass weighing about 773 pounds. The range in dressing percentage was 53.55 to 58.50 per cent, with approximately 70 per cent of the cattle dressing between 55 and 57.5 per cent. Steers from north Virginia dressed on an average 55.17 per cent. The difference in dressing percentage of the cattle from the two sections may be within the error of sampling, but the lighter weight of the north Virginia cattle and their somewhat greater market fill probably accounts for their yield being slightly less than that of the cattle from southwest Virginia. Approximately 70 per cent of the north Virginia steers dressed between 54 and 56.5 per

cent. The cool weight, which is about 2.5 per cent less than the warm weight, was used in computing the dressing percentage or carcass yield of each group. These percentages are in line with what can be expected from steers of such grade and weight. The market fill, which is generally very high at Jersey City because of the long time that cattle are held there before being offered for sale, tends to lower the carcass yields. The dressing percentage of southwest Virginia steers declined somewhat as the season advanced. This indicated that the better cattle were marketed earlier, which is in accordance with the general practice of "topping-out' herds and leaving the inferior animals to be marketed last.

In both groups the carcasses graded much in line with the live animals. The steers from north Virginia graded somewhat higher than those from southwest Virginia. Approximately 85 per cent of those from the latter section graded from average Medium to low Good for both the live animal and the carcass. The other 15 per cent graded down to the low end of Medium, with a few individual steers grading as low as Common. Practically all the steers from north Virginia graded from average Medium to average Good with a large proportion in the upper range. They showed more quality, had better conformation, were younger and lighter, and seemed to meet the trade requirements much better than did the steers from southwest Virginia. Market and trade conditions, however, were more favorable during the period in which they were marketed, and this may partly account for the fact that they sold for 92 cents per 100 pounds more than did the steers from southwest Virginia. A more complete discussion of the seasonal variations in the supply and price of cattle by grades appears elsewhere in this bulletin.

Figure 6 shows the selling price of the various lots of cattle and the price range of Medium grade heavy steers at Jersey City at the time they were marketed. The average selling price of the carcasses was $15.09 per 100 pounds for the north Virginia steers and $13.25 for the steers from southwest Virginia. The carcass prices held about the same relationship as was noted in the live cost. Carcass prices showed considerable variation, largely because of color, weight, and grade of carcass, and market conditions at the time of sale. All the cattle were kosher slaughtered, but approximately 15 to 20 per cent of the carcasses failed to meet the Jewish requirements. Failure to meet these requirements did not necessarily make the meat objectionable for the non-Jewish trade.

The relative value of Virginia cattle is enhanced slightly by the weight and grade of hide obtained. Information was obtained on the weight, percentage, and grade of hides taken from the steers that were followed through the slaughterhouses. The hides were classed largely as spready and heavy natives. Around 80 per cent graded as No. 1. The hide represented about 6 per cent of the live weight of the steer, and for the heavy steers amounted to about 80 to 85 pounds. Very few branded hides were observed. Hides from koshered cattle may sell at a slight discount because of the methods of slaughtering.

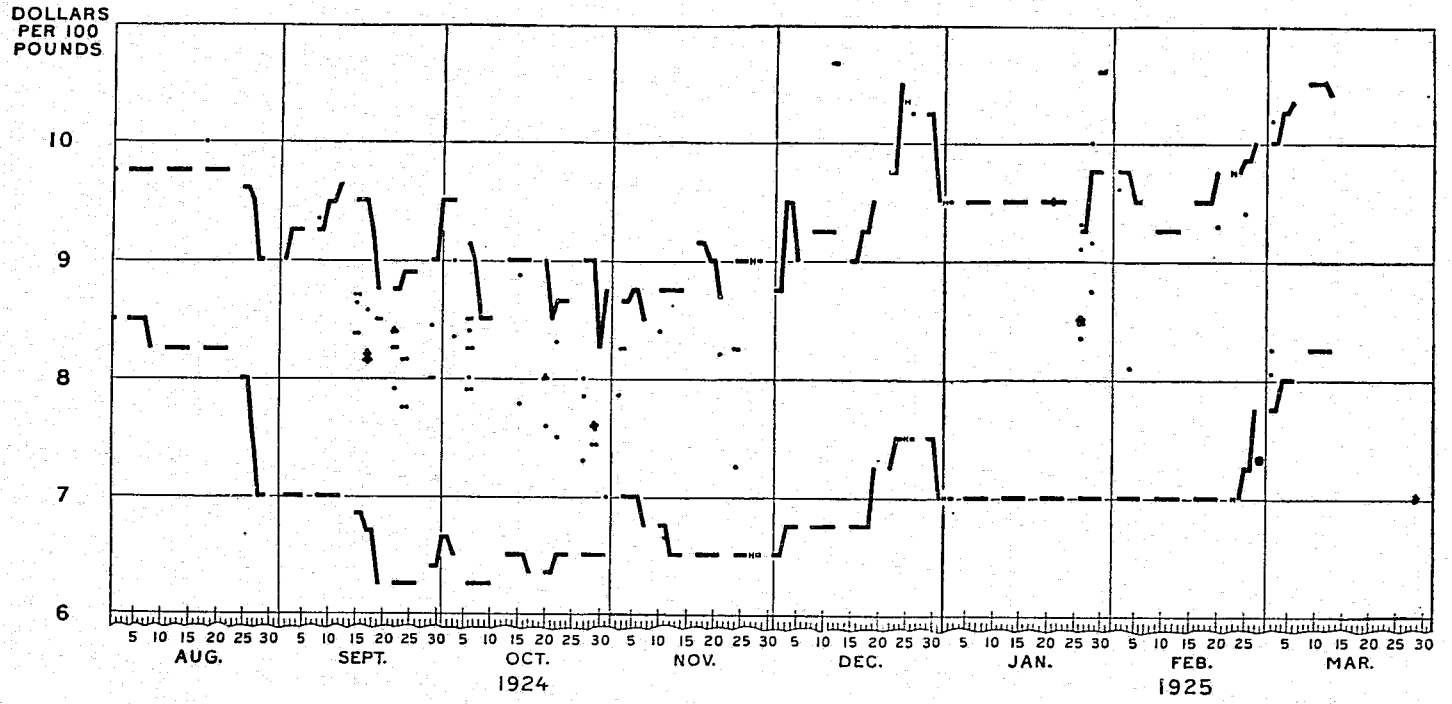

FIGURE 6.—SALES OF VIRGINIA CATTLE AT JERSEY CITY

The space between the heavy broken lines represents the range of market prices for Medium grade steer at Jersey City during the period in which the selected shipments were sold. Each dot represents the selling price of a car lot of Virginia cattle followed through the Jersey City market. Those in 1924 were grass cattle from southwest Virginia and those in 1925 were fed cattle from north Virginia

MARKETING COSTS OF COMPETING CATTLE

Since eastern slaughterers buy many of their cattle at midwestern markets, like Chicago and Kansas City, it is of interest to compare the cost of delivering these cattle to New York with the cost of buying direct in Virginia and with the marketing costs of shippers located in that State who consign to the Jersey City market.

The freight rate on live cattle from Kansas City to Jersey City is 83 cents and from Chicago to Jersey City 56.5 cents per 100 pounds. Feeding costs en route approximate $7.50 per car between Kansas City and Jersey City and $4.50 per car from Chicago. Buying commission at both these midwestern markets is 50 cents per head, with a minimum of $10 and a maximum of $15 per car.

The New York slaughterer who buys cattle at Chicago or Kansas City must add the following charges per 100 pounds to his buying

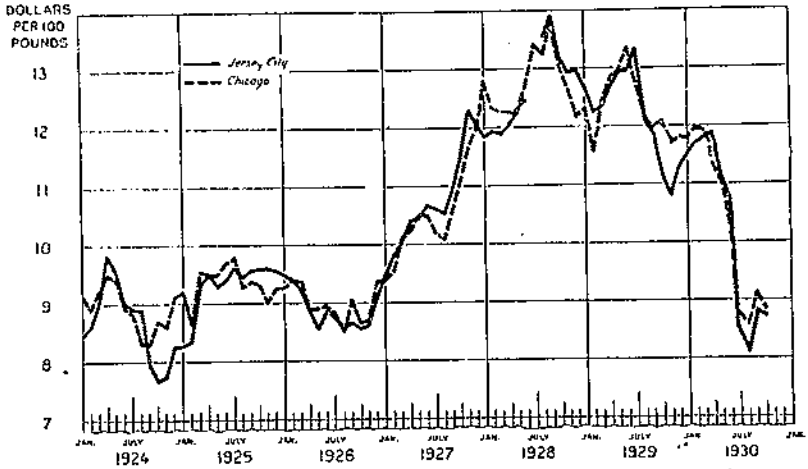

FIGURE 7.—MEDIUM-GRADE STEERS: AVERAGE MONTHLY PRICE AT JERSEY CITY AND CHICAGO, 1924-1930

Jersey City prices are usually higher than Chicago prices when heavy steers sell at a premium over lightweight steers. When the lighter steers command a premium over heavyweights Jersey City prices are usually lower than Chicago prices. This is particularly true in the late summer and fall and is important to Virginia cattle shippers because most of the Virginia steers are marketed as heavyweights

price to ascertain the approximate delivered cost to his plant on the basis of a 24,000-pound load of 20 steers:

If bought at Chicago:	Cents per 100 pounds	If bought at Kansas City:	Cents per 100 pounds
Buying commission	4. 2	Buying commission	4. 2
Freight	56. 5	Freight	83. 0
Feed in transit	1. 9	Feed in transit	3. 1
Total	62. 6	Total	90. 3

Apparently about 63 cents must be added to the Chicago purchase price and 90 cents to the Kansas City price to arrive at the cost laid down at the plant in Jersey City or New York. Knowing these costs and the prices prevailing at Chicago and Kansas City, together with the average yield and grade of beef that can be expected from western and Virginia cattle, the New York slaughterer can determine what he can afford to pay for Virginia cattle, either at the home of the producer

or at Jersey City. On cattle of similar grade and same yield of dressed beef, the Jersey City market must maintain a differential of not to exceed 63 cents above the Chicago price to be on a parity with the Chicago market. The required differential over Kansas City to put the two markets on an even basis is 90 cents. The actual price differentials between Jersey City and the western market are usually smaller than these figures. In fact, it is not uncommon for the quoted prices at Chicago to be higher than those quoted at Jersey City. (Table 17 and fig. 7.) The relationship between prices at Jersey City and at Chicago is discussed in detail later.

TABLE 17.—*Average price per 100 pounds of medium-grade steers, 1,100 pounds up, at Chicago and Jersey City and differential between the two markets, by months, 1924–1929*

Month	1924			1925			1926		
	Chicago	Jersey City	Price differential [1]	Chicago	Jersey City	Price differential [1]	Chicago	Jersey City	Price differential [1]
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
January	9.11	8.46	−0.65	9.20	8.26	−0.94	9.26	9.46	0.20
February	8.88	8.62	−.26	8.65	8.33	−.32	9.38	9.38	.00
March	9.22	9.04	−.18	9.54	9.32	−.22	9.37	9.22	−.15
April	9.47	9.84	.37	9.49	9.50	.01	8.88	8.85	−.03
May	9.39	9.55	.17	9.48	9.28	−.20	8.91	8.54	−.37
June	8.93	9.00	.07	9.69	9.38	−.31	8.95	8.87	−.08
July	8.80	8.90	.10	9.78	9.61	−.17	8.83	8.75	−.08
August	8.30	8.88	.58	9.26	9.44	.18	8.48	8.56	.08
September	8.29	7.96	−.33	9.36	9.56	.20	9.05	8.66	−.39
October	8.60	7.67	−1.02	9.32	9.58	.26	8.64	8.55	−.09
November	8.60	7.74	−.86	9.00	9.60	.60	8.71	8.62	−.09
December	9.11	8.24	−.87	9.24	9.55	.31	9.37	9.02	−.35
	1927			1928			1929 [2]		
January	9.39	9.46	0.07	12.81	11.85	−0.96	12.32	12.66	0.34
February	9.54	9.80	.26	12.32	11.93	−.39	11.58	12.24	.66
March	10.11	10.03	−.08	12.27	11.88	−.39	12.41	12.32	−.09
April	10.24	10.40	.16	12.24	12.02	−.22	12.86	12.69	−.17
May	10.50	10.44	−.06	12.22	12.32	.10	12.96	12.93	−.03
June	10.50	10.67	.17	12.72	12.45	−.27	13.36	12.96	−.40
July	10.19	10.62	.43	13.41			12.76	13.34	.58
August	10.08	10.53	.45	13.24	13.54	.30	12.17	12.08	−.09
September	10.59	10.94	.35	13.77	13.92	.15	11.98	11.86	−.12
October	11.09	11.48	.39	13.01	13.17	.16	12.10	11.16	−.94
November	11.67	12.30	.63	12.64	12.93	.29	11.73	10.82	−.91
December	12.00	12.03	.03	12.16	12.97	.81	11.80	11.30	−.50

[1] Jersey City price over Chicago price. Minus sign indicates that the price in Jersey City was lower than that in Chicago.

Packers who buy cattle direct from producers in Virginia and have them shipped to their plants pay an average of about 54 cents per 100 pounds for freight charges and feed in transit, and about 7 to 8 cents per 100 pounds as buying commission. As the net shrinkage of cattle consigned to Jersey City averaged around 4.7 per cent, allowance for this at the prevailing Jersey City market price must also be made in comparing the cost of buying in the country with the cost of buying on the market. If the current market price is $10 the cost of buying in the country would approximate $1.09 per 100 pounds and this amount would have to be subtracted from the Jersey City price to ascertain the price that the slaughterer could afford to pay in the country. This makes no allowance for possible loss or damage in transit, which under ordinary conditions is rather small.

COMPARISON OF CATTLE PRICES AT JERSEY CITY AND CHICAGO

At Jersey City it is the common practice to hold cattle on feed and water for 24 to 72 hours after arrival, the average as shown in Table 16 being about 38 to 40 hours. This permits cattle at Jersey City to take a very heavy fill as compared with those at Chicago. A heavy fill lowers the dressing percentage, and buyers take this into consideration when making bids. For instance, if the buyer has reason to believe that one steer carries 30 pounds more fill than another, he knows that the steer with the larger fill must be bought at a lower price if the dressed product from the two steers is to be equal in unit cost. Assuming a price of $12 per 100 pounds, 30 pounds of extra fill amounts to $3.60, and on a steer weighing 1,200 pounds, it would necessitate reducing the price 30 cents per 100 pounds to allow for this extra fill. In other words, making allowances for differences in fill could easily account for a difference of 20 to 40 cents per 100 pounds between prices at Chicago and Jersey City.

In addition to increased fill, buyers at Jersey City take into consideration certain physical characteristics frequently found in the cattle received at that market from Virginia and West Virginia which appear to be less common in cattle purchased at Corn Belt markets. These characteristics are discussed in that part of this bulletin that deals with the grade of Virginia cattle.

Another factor that must be taken into consideration when making price comparisons between Jersey City and Chicago is the opportunity of making a choice from a variety of offerings within the grade. The bulk of the steers offered for sale at Jersey City consists of rather heavy, aged steers, somewhat coarse in type, and in the summer and fall they are practically all grass finished. Such steers are in demand for only a certain class of trade, and as this demand is somewhat limited it can be easily oversupplied. During the period when receipts are largest at Jersey City, slaughterers have no great difficulty in supplying their needs for the plainer kinds of cattle, but they are compelled to go elsewhere to supply the remainder of their wants and about three-fourths of the time the Jersey City market offers little from which to choose.

At Chicago, a wide range of offerings within a grade are on sale the year around; young cattle and aged cattle, lightweights, medium weights and heavyweights, grass-fed and corn-fed. Slaughterers, knowing that a greater variety of offerings can be found at Chicago, prefer to buy there rather than to confine their purchases to a market that offers a limited supply and an equally limited range of grade, weight, and type. This preference is particularly marked when the difference in cost favors western markets. All this undoubtedly tends to reduce the buying competition between slaughterers at Jersey City. Another type of competition absent from that market is that which comes from the stocker and feeder buyer. Practically all of the offerings at Jersey City go direct to slaughterers, as it is seldom that any are taken back to the country.

Table 17 shows that in 1924 Jersey City prices were higher than those at Chicago from April to August, inclusive, and considerably lower during January and during the last three months of the year. In 1925, Chicago prices were higher than those at Jersey City during the first seven months with the exception of April. Excluding January, the differentials were not large. During the last five months, Jersey City prices exceeded Chicago prices by a fair margin.

The price differentials in 1926 were relatively small throughout the year, but in only two months, January and August, were Jersey City prices higher than those at Chicago. In 1927 Jersey City prices exceeded Chicago prices in every month except March and May. In 1928 they were higher than Chicago prices in May, and from August to December, inclusive. During 1929 they were lower than Chicago prices in all months except January, February, and July.

In three years out of the six, Jersey City prices were higher than those at Chicago during the months when receipts were largest, which is the period during which the bulk of the Virginia cattle are marketed. The most striking feature revealed in comparing prices at the two markets is that when heavy cattle were selling at a premium over lightweights, prices at Jersey City were higher than those at Chicago, and when the situation was reversed (when lightweights commanded the premium) Chicago prices were the higher of the two. Since the bulk of the steer receipts at Jersey City comprise heavyweights, especially those originating in Virginia, this is a matter of significant importance to Virginia cattle producers. In brief it means that when weight is in demand, slaughterers may be willing to put less emphasis on grade in order to get the heavy cattle needed; and at such times Virginia cattle usually sell well.

On the basis of weekly average prices at the two markets, it is found that in the 309 weeks for which prices are available in the six years, 1924–1929, there were 165 weeks when the Chicago price exceeded the Jersey City price, 139 weeks when the Jersey City price was the higher of the two, and 5 weeks when the average prices were the same. The average of the differential in the 165 weeks when the Chicago price exceeded that at Jersey City amounted to 38.6 cents, and in the 139 weeks when the Jersey City price was highest it amounted to 32.7 cents.

It is apparent, therefore, that over a long period the averages of the two differentials tend to equal or to cancel one another. In other words, in averaging the differential for the 309 weeks it is reduced to about 6 cents in favor of the Chicago price. With free trading and ordinary competitive conditions, it may be assumed that over a long period prices at the two markets have tended to adjust themselves to an equal basis, due allowance being made for the factors that must be given consideration by the buyer. These factors are the cost of transporting cattle from Chicago to Jersey City as one element which is offset by such unfavorable items in Jersey City offerings as excessive fill, lack of variety in grade and weight from which to make selections, and undesirable characteristics which tend to make the meat difficult to sell in a discriminating market like New York.

MARKET GRADES OF CATTLE

In the wholesale-beef trade there are four principal commercial grades of beef. These, in descending order are, Choice or No. 1, Good or No. 2, Medium or No. 3, and Common or No. 4. Corresponding grades are found in the live-cattle market. Grades lower than Common are known as Cutters or No. 5, and Low Cutters or No. 6, but these are found only in limited numbers in steers of any degree of beef breeding and then only when the animals are extremely thin from lack of sufficient feeding or because of disorders. The very highest grade of steers is known as Prime or No. A1, but those of this grade are usually so nearly ideal in conformation, quality, and finish

as to make them suitable for show purposes. Because of their relative scarcity they are not very important in the commercial supply.

The proportion of the different grades in the market supply varies from year to year and rather widely according to season. This is because the degree of finish or fatness is one of the important factors in determining the grade of a steer, and feeding and grazing practices are regulated to a large extent by the seasons. Other things being equal, cattle fattened on grass grade lower than do those fed extensively on grains and other concentrates, and, excluding those produced in southern Texas, most grass cattle are marketed in the late summer and fall near the end of the grazing season. The feeding of cattle on grain begins after the grain crops are harvested and extends through the following winter and spring and to a limited extent into the summer. Steers that have been on grain for a limited period (30 to 90 days), are frequently referred to as "warmed up" and "short-fed" steers. Those fed grain four months or longer are commonly spoken of as "long-fed." Cattle fattened on grass are known as "grassers."

As a result of the grazing and feeding practices followed in this country the market supply of cattle tends to vary in make-up and quality through the year as follows:

January—Mostly "warmed-up" and "short-fed" steers and heifers grading Common and Medium to low Good, with some fed cows.

February.—Much like January but with a larger proportion grading higher because of longer feeding on grain.

March.—Steers predominate, with a larger proportion in the higher grades than in the two previous months because of the longer time on grain feed. Cows coming to market are largely from dairy herds.

April.—"Long-fed" steers and yearlings more numerous and "short-feds" less plentiful. Cows largely from dairy herds. Because of their relative scarcity Common and Medium grade cattle sell near the levels of the better grades.

May–June.—The better grades of fed steers are relatively most plentiful and the Common and Medium grades scarcest. As a result, the spread between the lowest and highest prices is the narrowest for the year. Some grass cattle from southern Texas begin to appear in market receipts.

July–August.—Grass cattle increase in numbers as the season advances, and "grain-feds" are less plentiful, although the actual number of "long-feds" grading Choice and better increases. The supply of cows also increases. The price spread on steers widens as prices of the better grades advance and those of the lower grades decline.

September–October.—Grass cattle make up the bulk of the supply, and grain-feds are relatively scarce. The price spread continues to widen and usually reaches its maximum in one of these months. Grass cows from beef herds make up a larger proportion of the supply.

November.—November is the clean-up month, and the supply includes a large proportion of low-grade cattle of various kinds which producers deem inadvisable to carry through the winter. Near the end of the month the supply includes a number of "long-fed" cattle that were fattened for exhibition at the livestock shows and expositions and for the holiday market.

December.—Many "warmed-up" cattle in the supply and a few "long-feds" for the Christmas beef market.

An unpublished study made by the Bureau of Agricultural Economics in 1920 indicated that the percentage distribution of the different grades of steers slaughtered during the war period and the postwar period up to 1920, inclusive, was approximately as follows: Prime, 0.5; Choice, 4; Good, 22; Medium, 53; Common, 17; and Cutter and Low Cutter, 3.5. The precentage distribution varies widely between markets, however, and some markets seldom, if ever, receive any Choice and Prime steers for sale, and their offerings of Good grade steers are usually very limited in number.

The bulk of the Choice and Prime steers are produced in the Corn Belt States, and a very large portion of these steers are marketed at Chicago. For this reason the average quality of the Chicago receipts is much higher than that at other markets. Table 18 shows the average monthly percentage distribution of steers by grade (western range steers excluded), sold out of first hands for slaughter at Chicago for the eight years 1922–1929. Since steers from the western ranges were omitted from the data from which these percentages were computed this table does not give a complete picture of the total supply situation. If western steers were included the figures would show that the majority of the steers marketed for slaughter are of Common and Medium grades. These two grades include practically all cattle that have been finished on grass and a large part of those that have been fed for a short time on grain and other concentrates. It is apparent, therefore, why they comprise the bulk of the market offerings. A few of the best grass cattle will grade in the low end of Good, but the majority will not grade higher than Medium.

TABLE 18.—*Percentage distribution of steers sold out of first hands at Chicago, by grade and by month, average, 1922–1929* [1]

Month	Choice and Prime	Good	Medium	Common	Other grades
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*
January	2.8	19.9	50.3	24.2	2.8
February	3.2	20.9	52.7	21.3	1.9
March	4.2	24.5	49.4	19.8	2.0
April	8.4	28.2	47.4	14.2	1.8
May	9.6	34.0	43.2	11.4	1.9
June	17.2	38.7	34.1	7.0	2.4
July	20.9	38.9	29.1	8.4	2.7
August	13.8	44.4	26.5	8.4	1.9
September	14.9	45.1	25.2	12.4	2.4
October	15.9	37.3	27.1	16.6	3.1
November	9.8	39.6	36.8	10.7	3.1
December	5.7	24.2	44.4	23.1	2.6
Average	11.0	32.3	38.9	15.4	2.4

[1] Western range steers excluded.

To grade Choice or Prime, cattle must have been fed extensively on grain or other concentrates, and most cattle of Good grade will have received considerable concentrates. The fact that grass-fat steers are marketed during the latter half of the year and comprise the bulk of market receipts of steers during September, October, and November obviously increase the proportion of Medium grade steer beef at this season to the highest levels of the year. Likewise the supply of the higher grades, Good and Choice, declines during these months. This condition results in the extremely wide price spread between the different grades of both slaughter steers and dressed beef during the fall months. This is brought out in Figure 8, which shows the monthly average prices of western dressed fresh steer beef at New York, and in Figure 5, which shows the average prices of the different grades of beef steers sold out of first hands at Chicago for slaughter. With a large supply of Medium and Common grades, the prices for such grades are forced down, while a relative scarcity of the higher grades tends to hold or advance the values of these. During the spring and early summer months the opposite condition prevails, as the supply of cattle fed extensively on grain and other

concentrates is the largest of the year, the number of low grade cattle is the smallest, and the price spread is contracted.

Virginia cattle that have been fattened on grass, although varying somewhat, will mostly grade Medium. Of the 52 shipments followed through the market from southwest Virginia, 85 per cent graded from average Medium to low Good. The other 15 per cent graded down to the low end of Medium, with a few individual steers grading as low as Common. A similar range in grade was noted in the beef produced from these steers. The cattle from north Virginia graded slightly higher than those from the southwest section, only about two lots grading below average Medium and about 90 per cent from average Medium to average Good.

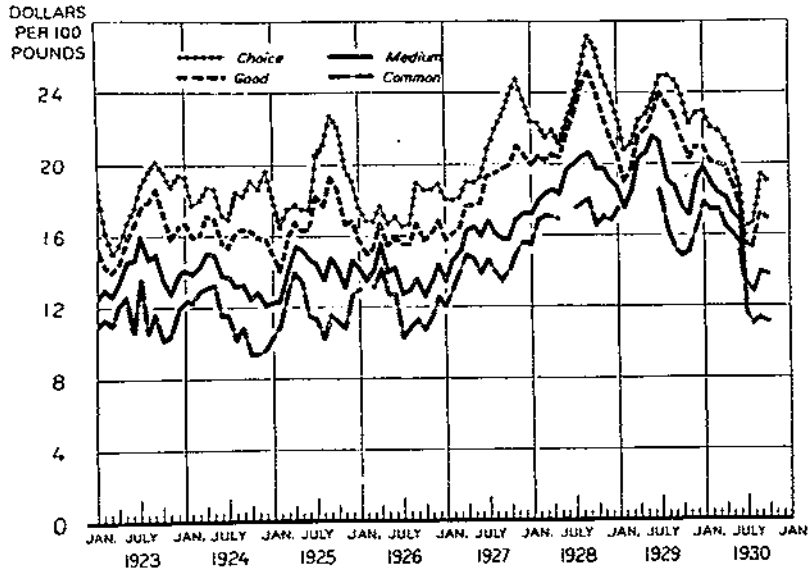

FIGURE 8.—WHOLESALE PRICES OF WESTERN DRESSED FRESH STEER BEEF AT NEW YORK CITY BY GRADES, 1923 TO OCTOBER, 1930

The lower grades of beef are scarcest and sell at the highest prices from late winter to early summer. They are the most plentiful and sell at the lowest prices in the fall and early winter. The reverse is generally true of the better grades

COMPETITION FOR VIRGINIA BEEF IN THE NEW YORK MARKET

Since the ultimate destination of a large percentage of the beef cattle produced in Virginia is the metropolitan district embracing New York City and surrounding towns, the demands of that market and the source of its beef supplies should be given consideration by Virginia cattle producers.

New York City is the distributive center for a population of approximately 10,000,000 people; hence it requires immense quantities of foodstuffs daily. Concentrated in this congested area is the greatest buying power in the United States, if not in the world. In degree of wealth the consumers who must be supplied range from those living in extreme poverty to those who can buy the most expensive luxuries. Nowhere is a greater variety of food products offered for sale; nowhere is greater and less discrimination shown with respect to quality in the purchase of food; hence in no other city is one likely to find a wider range in food prices.

New York's tremendous consuming capacity makes it a dominating factor in determining prices for food products throughout the country. Particularly is this true in the case of meats, and consequently of livestock. Price changes in New York's wholesale meat markets are quickly reflected in the livestock markets throughout the country; hence livestock and meat-trade interests in every important center usually keep in close touch with developments in New York City.

Available records show that the meat supplies of the New York metropolitan district in 1928 totaled almost 1,500,000,000 pounds, of which more than 600,000,000 pounds, or 44 per cent, was beef. Only a very small part of this beef is produced in near-by territory, and that is mostly from dairy cows which have ceased to be profitable as milk producers and from dairy bulls no longer desired for breeding purposes. Some comes from the steers fattened in the Lancaster feeding district and some from Virginia, West Virginia, Kentucky, and Tennessee. The bulk of the supply comes from the surplus-cattle-producing States in the Corn Belt and the far West, but only after the cattle have been assembled at the large mid-western livestock markets, such as Chicago, Kansas City, Omaha, and East St. Louis. Western or Corn-Belt cattle, which ultimately make up the bulk of New York's beef supply, may be slaughtered at these western markets and the meat then shipped to New York, or they may be shipped alive through public stockyards to be slaughtered in New York and vicinity.

The largest proportion of the cattle that reach the New York district is unloaded at the public stockyards located in Jersey City. Such cattle are reshipped by boat to slaughtering plants in New York, or are driven or hauled to near-by plants in Jersey City and Newark. Considerable stock, particularly shipments from the dairy sections of upper New York State, also is received at the public yards located at Forty-first Street in New York City. Open public markets for the purchase and sale of livestock are maintained at both of these yards, and considerable trading is done, particularly in cattle, calves, and lambs. More than 98 per cent of the hogs received at these yards, however, represent shipments direct to slaughterers from points in the Corn Belt. The bulk of the livestock received for sale represents the receipts from near-by States and from Virginia, West Virginia, Kentucky, Tennessee, and Ohio.

Beef from cattle slaughtered at the western packing centers is shipped in refrigerator cars and is known as western-dressed beef. Most of this beef is shipped as carcasses divided into quarters.

Beef from animals slaughtered in the local slaughterhouses in New York and vicinity is known in the trade as city-dressed or locally dressed beef. Although it would seem uneconomical to ship live cattle such great distances as from Chicago and Kansas City to New York for slaughter when fresh beef can be transported in good condition in refrigerator cars, more than one-half of New York's beef supply is obtained from this source. Local slaughter of cattle is necessary in order to meet the requirements of New York's large Jewish population.

The religion of the orthodox Jews prohibits those of that faith from eating pork in any form, and requires that their beef, veal, lamb, and mutton come from the fore quarters of animals slaughtered in a prescribed manner; the meat should be used within three days after

slaughter. Such meat is known as kosher meat. Kosher is a Jewish word meaning ceremoniously clean. If fresh kosher meat is not used within three days after slaughter it must be washed every third day thereafter until the twelfth day, after which it is no longer considered kosher but is referred to as "tref," meaning ceremoniously unclean and may not be used. Very little fresh meat is used as kosher after the third day unless a holiday or some emergency makes it seem necessary. The hind quarters from kosher cattle and sheep are sold to the non-Jewish trade.

The quantities of the various kinds of beef available in New York in the three years, 1927–1929, are shown in Table 19. New York takes about 10 per cent of the country's total federally inspected slaughter of cattle, exclusive of calves. Prior to 1927 it used on the average nearly 1,000,000 cattle annually, excluding calves, but during the last four years the consumption has dropped below this amount chiefly because of the general reduction in cattle slaughter due to decreased production.

TABLE 19.—*Supplies* [1] *of beef in metropolitan New York, 1927–1929*

Kind of beef	Estimated average weight	1927 [1]	1928 [1]	1929
	Pounds	*Pounds*	*Pounds*	*Pounds*
Western dressed:				
Steer carcasses	690	[1] 242, 519, 700	[1] 207, 939, 150	[1] 237, 103, 800
Cow carcasses	500	[1] 15, 903, 000	[1] 10, 372, 000	[1] 20, 585, 750
Bull carcasses	700	[1] 3, 080, 300	[1] 3, 931, 900	[1] 3, 495, 150
Beef cuts		21, 811, 245	16, 578, 647	18, 628, 528
Beef offal		1, 100, 520	1, 176, 123	1, 231, 918
Beef trimmings		22, 955	80, 179	229, 569
Cured beef		264, 957	250, 850	105, 496
Total		285, 282, 677	248, 428, 849	281, 470, 511
Locally dressed:				
Steer carcasses	750	[1] 315, 105, 000	[1] 292, 500, 000	[1] 280, 175, 250
Cow carcasses	475	[1] 12, 722, 875	[1] 19, 783, 275	[1] 13, 706, 125
Bull carcasses	700	[1] 29, 113, 000	[1] 32, 146, 800	[1] 25, 425, 400
Total		357, 000, 875	344, 820, 075	328, 306, 775
Imports:				
Beef carcasses	600	[1] 6, 496, 200	[1] 24, 112, 500	[1] 10, 630, 050
Beef cuts		837, 097	3, 708, 853	4, 085, 509
Cured beef		141, 551	347, 589	2, 428, 934
Canned meats [2]		13, 661, 468	8, 611, 881	22, 803, 674
Total		21, 136, 316	36, 780, 743	39, 346, 167
Grand total		663, 419, 868	630, 029, 667	649, 123, 453

[1] The total weight of carcass beef was computed by multiplying the actual number of carcasses by estimated carcass weights.
[2] This is believed to be mostly beef.

The outstanding characteristic of New York's beef consumption is the marked preference for steer beef. Approximately 18 to 20 per cent of the total federally inspected slaughter of steers goes into New York's fresh beef supply whereas less than 2 per cent of the inspected slaughter of cows and heifers is included in this supply. In other words, New York uses almost 13 pounds of fresh steer beef to 1 pound of fresh cow and heifer beef. It also uses about 12 to 16 per cent of the annual inspected slaughter of bulls and stags.

The kosher trade prefers heavy steer beef but will also pay top prices for well-finished yearling beef. The average weight of locally dressed

steer carcasses is much greater than that of western-dressed steers being estimated at 750 pounds as compared with 600 pounds for the latter.

The hotel and steamship trade also prefers heavy beef and uses the hindquarters from koshered cattle. There is also a demand at Boston for some of the heavy beef that reaches New York.

Average weekly supply figures for the five years 1924–1928, inclusive, show that New York's beef supply is fairly steady throughout the year. Supplies tend to decline slightly from the beginning of the year until about the first of April, probably because of reduced demand during the Lenten season, which extends from about the middle of February to Easter. Supplies then increase until about the middle of May, at which time there is a strong demand for kosher beef following the Jewish Passover, which occurs usually in April. From the middle of May until about the first of August supplies decrease, probably because the demand is decreased by the gradual rise in temperature as summer weather approaches and by the departure of many people from the city on vacations. New York has many visitors during the summer, however, and there is a tendency for supplies to increase during August and to decline sharply about the first week in September, when the Labor Day holiday occurs. Supplies again increase during September and October, to meet the increased demand resulting from the return of those who have been away from town, but they fall off during the end of the year, at the time of the Thanksgiving and Christmas holidays.

Demand for locally dressed beef is affected materially at the time of Yom Kippur, which usually occurs in September or early October. This is a period of fasting for orthodox Jews, and no meat is eaten by them then; hence smaller supplies are required. The fact that Yom Kippur occurs during the time when cattle are moving freely to market from Virginia is an adverse factor in the marketing of these cattle, and experienced Virginia shippers endeavor to avoid having their cattle reach market during this holiday.

The hind quarters from koshered cattle are sold to the non-Jewish trade, and if the supply is unusually large the market may not absorb it except at a discount, as the average non-Jewish consumer prefers beef from cattle of lighter weight than those used in the kosher trade. The best outlet for such hind quarters is the trade from hotels, restaurants, dining cars, and steamship companies, but this trade prefers the Good and Choice grades, which are not produced to any great extent in Virginia. This tends to restrict the outlet for the hind-quarter beef from Virginia cattle even though there might be a good demand for the fore quarters. This undoubtedly is one of the factors which frequently adversely affects the price of Virginia cattle.

The fact that Virginia cattle are finished on grass and are marketed in the late summer and fall, which is the time when grass cattle are most abundant, undoubtedly makes it difficult to realize the best returns on them and is a matter that the producers of such cattle should consider. Furthermore, the growing tendency in the Middle West to finish cattle on corn or other concentrates, and the increasing demand for more highly finished beef on the part of consumers, is tending to develop stronger competition against all grass cattle. Most of the strictly grass-finished beef of western origin is from lighter and younger animals than the beef from Virginia steers. The bone is not

so hard, and the meat is likely to be slightly more tender. It should be kept in mind, however, that although the beef from Virginia steers might grade the same as that from western grass steers it would not necessarily sell at the same price. Weight is a factor of considerable importance in the New York market; for this reason strictly grass-finished beef from Virginia steers usually will command a higher price than that from the lighter-weight western grass steers even though the grade may be the same.

In making price comparisons with cattle sold or bought at mid-western markets the Virginia producer is more likely to compare his cattle with grain-fed steers from the Corn Belt rather than with the grass cattle of that region or the West. Seldom will he find that his grass-fed steers sell as low as the bulk of the strictly grass-fed steers of the range country, but neither is he likely to find that they sell as high as Corn Belt steers that have had considerable grain.

PROBLEM OF DARK-COLORED BEEF

Carcasses from Virginia steers vary considerably in their visible characteristics and these variations account in large degree for differences in grade. Some characteristics frequently noted in the carcasses of these steers are considered objectionable by meat dealers, particularly those in New York City. These are as follows:

Conformation.—Rounds poorly developed, loins flat or slightly concaved, fores "spready" with ribs lacking in high degree of plumpness, chucks slightly angular and rough.

Finish and quality.—Flesh lacking firmness; liberal covering of fat on exterior but uneven in distribution; moderate fat deposits over kidneys and in other internal sections; fat yellowish-white rather than the desired creamy-white color, and inclined to be soft. Lean meat shows little evidence of marbling and is dark-red instead of the preferred light, or cherry, red color. Bones hard and flinty.

Beef that shows the above-mentioned characteristics practically always grades Medium or lower. Contrast these characteristics with the following which are usually noted in Virginia beef that will grade Good.

Conformation.—Rounds and loins well developed; fores and ribs fairly blocky.

Finish and quality.—Flesh fairly firm to firm and smoothly covered with a moderate quantity of creamy-white fat; normal quantity of fat over kidney and other internal sections; lean is light red and possesses a fair degree of marbling; chine bones are moderately soft and show considerable redness and cartilaginous ends.

When using Virginia beef in their trade New York dealers frequently attempt to substitute it for beef from grain-fed steers that have been slaughtered locally. Excluding those finished on grass in Virginia and West Virginia, the bulk of the steers that go into the kosher trade in New York comprise grain-fed steers from the Corn Belt which yield carcasses weighing from 750 pounds up; the hindquarters and ribs from these steers enter largely into the hotel, restaurant, steamship, and dining-car trade. Grass-finished steers from Virginia and West Virginia usually are heavy enough to yield carcasses of the desired weight for this trade, and the best of these carcasses possess fairly good conformation and usually have a fair covering of fat. But the meat is frequently dark red rather than a light red, or cherry, color. In a total of 1,098 carcasses from the steers shipped from southwest Virginia in the summer and fall of 1924, and followed through the slaughter plants and meat coolers, it was found that 269,

or 24.5 per cent, were dark in color. Of the steers shipped from the Shenandoah Valley and north Virginia which had received some grain only 7.3 per cent cut dark.

In referring to beef that is dark red in color the trade often uses the terms "black" and "dark." The trade also uses the terms "black cutter" and "dark cutter" in referring to carcasses that have flesh that is darker in color than is desired.

When the hind quarters and ribs of Virginia steers are sold as substitutes for grain-fed beef they are likely to bring complaints from customers. This is particularly true if there are dark cutters among them. Customers who are accustomed to buying grain-fed beef that is of brighter color are not satisfied with the dark-cutting meat.

The first lot of hind quarters and ribs a wholesaler buys may look like a profitable investment, but when he gets complaints from his customers he promises himself that he will never buy any more beef from Virginia steers. The facts in the case are that the meat is not sold for what it is; it is sold as a substitute for something better but at nearly the same price. In some instances lots of Virginia beef are mixed with grain-fed beef of western origin in the coolers of local slaughter plants. Some buyers detect them and reject them when buying. Others take some of the carcasses without knowing it until the carcasses are cut up in their places of business, after which they complain and ask for adjustment. Some slaughterers sell hind quarters and ribs with a guarantee that they will cut bright. They have to credit back those that cut dark; this prejudices them against this type of beef because it can not be depended upon for color. Some slaughterers sell "as is" and then the buyer must beware, but if he finds a lot cutting out in an unsatisfactory way he is bitter against the Virginia beef for some time.

There is probably just as large a percentage of dark-cutting carcasses from cattle from western ranges as there is among Virginia steers, but the western grass-fed beef is not sold in competition with grain-fed beef. It usually sells at a lower price and on the whole escapes the complaints that are so often applied to the beef from Virginia. When the New York slaughterer speaks of western beef and compares it with that from Virginia cattle he always has in mind steers that have been fed some grain and usually those that have had considerable grain. He never intentionally buys strictly grass-fed beef from the West unless it is exceptionally good. As a consequence when he is comparing Virginia beef with western beef he is seldom making a comparison between cattle produced under anything like similar conditions. He figures the returns he gets from each load. If the Virginia cattle make money for him but cause him trouble in selling them, he may consider that his profits have reimbursed him for his troubles; but if he loses money on the transaction, or makes less than other dealers and, in addition, has trouble with his trade, he becomes a very poor customer for future offerings.

TRADE OPINION REGARDING VIRGINIA CATTLE

To ascertain the attitude of the trade toward the beef from Virginia and West Virginia steers, several of the leading wholesale beef distributors in New York City were interviewed and asked to com-

ment on the relative differences in the beef from these cattle and that from cattle produced and fed in the Corn Belt. These comments, although naturally varying somewhat in form of expression, were practically unanimous in their general meaning. It should be remembered that they represent individual opinion based on trade experience in buying and selling beef rather than on scientific research. They are presented here primarily for the purpose of showing the trade viewpoint.

It was apparent that in making comparisons the wholesalers usually had in mind corn-fed steers rather than western grass steers when referring to western or native cattle. This was well illustrated in the rather common statement that there was no comparison between the two classes of cattle, or that they could not be compared. The statement of the manager of the beef-sales department of one of the larger firms represents about the general opinion expressed by the New York dealers. His statement was as follows:

A Chicago native steer carcass usually has well-shaped, smooth hind quarters of uniform thickness, and small compact fore quarters. The bone is inclined to be soft; the fat is evenly distributed throughout, and is usually white in color. The carcass yield ranges from 58 to 61 per cent of the live weight. A large percentage of such cattle will grade from Good to Prime, and only a few will be coarse. The meat from these cattle has a bright and attractive appearance. Virginia cattle, on the other hand usually have flatter rounds, more sunken loins and proportionately large fore quarters. They have harder bone and such fat as is carried is usually on the outside and is yellowish in color. They yield, according to quality, from 55 to 57.5 per cent carcass. The meat is likely to be coarse and rather dark in color as compared with the meat from grain-fed steers. One superior characteristic of Virginia cattle is that they yield a larger percentage of clear, spready hides than do Chicago cattle, the hides of which are often branded. The difference between clear, spready hides and branded hides, is from 3 to 5 cents per pound in favor of the clear hide, depending on the price level for hides. Comparing carcasses of Virginia grass cattle with those from the better grades of western grass cattle, the latter usually have better conformation and more meat in proportion to bone. The meat also seems to be superior in quality, usually is brighter in color, and is more salable.

Another dealer stated:

If southwest Virginia cattle of equal quality were fattened on corn and fed to the same degree of finish as is found in the corn-fed cattle bought at Chicago, they would be just as desirable for New York slaughter as the Chicago cattle. Being grass-fed, cattle from southwest Virginia should be compared with cattle handled and fed or grazed in like manner. The grass cattle from Kentucky are more nearly comparable with those produced in Virginia. Ripe, corn-fed cattle when ribbed, will cut bright, meaning that the meat is of a bright-red color. In addition to cutting bright, the meat is nicely mixed with fat, which insures the eating qualities so generally desired. Grass-fed cattle, regardless of where they come from, are likely to show a larger percentage cutting dark than do corn-fed cattle, but we find that Virginia grass-fed cattle show a larger percentage of "blacks" than grass-fed cattle from other sections.

In the opinion of the trade, the wholesale price differentials between bright-cutting and dark-cutting carcasses varied from 1 to 10 cents per pound, depending upon the general price level and the demand for beef. The majority of those questioned stated that the average differential would vary from 3 to 5 cents.

The general opinion of those who slaughtered cattle was that it was impossible to determine before slaughter which animals would yield dark-colored beef. One dealer thought that lack of finish was the best indication, but he also stated that even the best grain-fed steers would sometimes cut black and that unfinished cattle would often yield bright meat. Another dealer was of the opinion that a larger

percentage of dark cutters would be obtained during the years when the grass was watery or "slushy" as a result of too much rain. It seems possible that there may be some foundation for his contention, as reports indicated a smaller proportion of dark cutters in 1925, when pastures were dry, than in 1924, when there was more rain and the grass was more watery. Two dealers suggested that the manner of handling the cattle immediately prior to slaughtering might have some influence on the color of the meat. They thought that if the cattle were allowed to rest for 36 to 48 hours before slaughter and given an opportunity to quiet down, the percentage of dark cutters would be greatly reduced.

In regard to the time of the year when dark cutters were likely to be most prevalent, the general opinion seemed to be that it was in late summer and fall, which coincides with the time of marketing grass cattle and hence is not indicative of anything other than that dark cutters are probably more common among grass cattle than among those fed grain. Some of the dealers stated that a small percentage of dark cutters are found throughout the year in grain-fed cattle.

Although opinion was somewhat divided as to whether the age of the cattle was a factor in determining the percentage of dark cutters, the majority indicated that this condition was found most commonly in aged steers, or those 4 years old or over. As most of the Virginia cattle are marketed and slaughtered as aged steers, no definite conclusion regarding this point can be drawn from the evidence available. The fact that one of the prize-winning baby beeves raised by a member of a boys' beef club in Virginia in 1924, dressed out dark beef, indicated that age may not be a cause. Several slaughterers stated that they had found dark cutters in cattle of all ages, ranging from yearlings to the oldest reaching the market. Most of them stated that black or dark-cutting were carcasses more commonly obtained from steers than from cows and heifers. This may be due to the fact that the number of females slaughtered is relatively small. Most of the slaughters also stated that black cutters were found occasionally in all grades as both the best and the poorest might cut dark. The keeping qualities of dark beef seemed to be as good as the bright colored, although its unattractive appearance made it difficult to sell to discriminating customers. So far as can be determined dark color does not affect the palatability of the meat and usually disappears in the process of cooking.

POSSIBILITIES OF INCREASING RETURNS ON VIRGINIA STEERS BY IMPROVING THE GRADE

Since Virginia cattle are fattened largely on grass they are marketed at a time when supplies of similar grades are most abundant and the price for such grades is least favorable. It is apparent, therefore, that anything that could be done toward changing the time of marketing or improving the grade of these cattle without involving too large additional cost probably would result in increased net returns to the Virginia producers. Although the marketing season can be advanced to a limited extent, thus obtaining slightly higher returns on the earlier shipments and reducing the volume of marketings during the peak period, the possibilities here are limited because the Virginia cattle grazier wants to obtain the maximum utilization of his pastures and have his steers make the largest possible gain in weight.

He can accomplish these only by keeping his cattle on grass until near the end of the grazing season in the fall.

Possibilities of improving the grade and selling value of Virginia cattle by supplementing pastures with grain and other concentrates during the grazing season deserve consideration. Experiments in cattle feeding conducted by the Bureau of Animal Industry and the West Virginia Experiment Station in Greenbrier County, W. Va.,[3] where conditions are similar to those in southwest Virginia, indicate that net returns can be increased materially in this way.

These feeding experiments were conducted in the three years, 1926 to 1928, inclusive; the tests were made with two grades of feeder steers, Medium and Good. The average weight of the steers at the beginning of the experiment for the three years was 918 pounds for the Medium grade and 966 pounds for those grading Good. The purchase price of the latter kind was $1.25 per 100 pounds greater than the price paid for the Medium steers.

The steers were bought in December and wintered in the usual way on corn silage, wheat straw, and cottonseed meal, and they were given access to pasture that was somewhat better than the average. The two grades were fed as near alike as possible, but the Good grade steers, being heavier and larger, consumed slightly more feed than did the Medium steers. The rations were sufficient to permit some gain in weight. In an average winter-feeding period of 140 days for the 3-year experiment, the Good grade steers gained 78 pounds per head in weight as compared with 59 pounds for the Medium steers, the Good grade steers making greater gains in proportion to the feed consumed than the Medium steers.

When the steers were turned on grass in late April each grade lot was divided into two lots. One lot of each grade was given access to pasture without supplementary feed, and the other two lots were fed a supplement of coarsely ground shelled corn and cottonseed meal. An average of the summer gains for the three years shows that the Good grade steers fed grain gained 317 pounds as compared with 337 pounds for the Medium steers handled in a similar way. The average increased gain of the Medium steers over the Good grade in these lots amounted to 6.3 per cent for the 3-year period.

The Good grade steers on grass alone made an average summer gain of 228 pounds as compared with 249 pounds for the Medium steers on grass without supplements. The average increase in gain for the Medium grade over the Good grade in these lots amounted to 9 per cent.

A supplement of corn and cottonseed meal increased the daily gains 54 per cent the first year (1926), 22 per cent the second year, and 40 per cent the third year, making an average of 37 per cent for the three years.

The profits during these three years were increased 29 per cent, 18 per cent, and 19 per cent, respectively, or an average of 20 per cent for the 3-year period, by the feeding of a supplement to steers on grass.

The feeding of grain increased the selling price of the Good grade steers $1.24, or 10 per cent, and the Medium grade steers $1.22, or 11 per cent.

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[3] Black, W. H., Warner, K. F., and Wilson, C. V. BEEF PRODUCTION AND QUALITY AS AFFECTED BY GRADE OF STEER AND FEEDING GRAIN SUPPLEMENT ON GRASS. U. S. Dept. of Agr. Tech. Bul. 217, 44 p., illus. 1931.

In 1926, the first year of the experiment, cattle prices were comparatively low and feeding was generally unprofitable, yet supplementing pasture with corn and cottonseed meal increased the net returns almost $5 a head on Good grade steers and $7.50 on Medium steers. In 1927 and 1928, the general cattle-price level advanced sharply, and this increased profits on all cattle-grazing and feeding operations. In these years, however, the use of supplementary feeds with pasture resulted in increases in the net returns ranging from about $8 to $17.50 per head over those obtained by the use of pasture alone.

Since the increase in profits was due to the higher selling price as a result of improving the quality and finish of the steer by the use of grain as well as of obtaining increased gain in weight, the cattle producer should give consideration to the probable margin that might be expected between the prices of different grades of steers at different seasons of the year. Table 20 shows the margins between average monthly prices of Good and Medium steers at Chicago for the nine years, 1921–1929, and Table 21 shows similar data for Jersey City for the six years, 1924–1929, as far as available. Good grade steers are not always on sale on the Jersey City market in sufficient numbers to warrant quotations, and when on sale they seldom represent the full range of the grade.

TABLE 20.—*Margin between average prices per 100 pounds of Good and Medium steers at Chicago, by months, 1921-1929*

Month	1921	1922	1923	1924	1925	1926	1927	1928	1929	Average 1921–1929
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
January	0.95	1.03	1.64	1.34	1.59	1.19	1.49	3.15	1.75	1.60
February	.70	.03	1.02	1.58	1.90	1.03	1.50	2.80	1.47	1.43
March	.71	.76	.81	1.60	1.22	.90	1.38	1.81	.72	1.10
April	.59	.69	.77	1.66	1.02	.83	1.47	1.56	.90	1.03
May	.54	.48	.74	1.37	.97	.72	1.44	1.37	.86	.94
June	.48	.60	1.07	1.18	1.12	.75	1.55	1.12	1.08	.90
July	.70	.82	1.12	1.34	2.25	.81	2.48	1.58	2.18	1.48
August	1.25	1.03	2.56	1.62	3.06	1.06	2.46	1.92	2.46	1.94
September	1.37	1.42	1.96	1.63	2.28	1.21	2.95	2.34	2.31	1.94
October	1.09	1.56	1.63	1.51	3.35	1.70	3.39	2.50	2.00	2.18
November	1.54	2.34	1.59	1.69	2.34	1.75	3.81	2.41	1.55	2.11
December	1.29	2.07	1.51	2.01	1.42	1.51	3.44	2.28	1.63	1.91

TABLE 21.—*Margin between average prices per 100 pounds of Good and Medium steers at Jersey City, by months, 1924-1929*

Month	1924	1925	1926	1927	1928	1929	Average [1] 1924–1929
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
January	1.95	1.36	----------	0.79	2.21	1.34	1.53
February	1.85	1.41	----------	.93	2.22	----------	1.58
March	1.74	[2] 1.36	1.16	.82	1.80	1.06	1.32
April	1.73	1.34	1.17	.86	1.47	1.14	1.28
May	1.57	1.14	1.10	.80	2.26	1.14	1.17
June	1.34	1.14	1.00	1.02	1.34	1.13	1.18
July	1.23	1.60	1.15	1.50	----------	1.40	1.39
August	1.25	2.19	1.28	1.48	1.78	1.85	1.64
September	1.96	1.88	1.26	1.57	1.58	1.67	1.70
October	----------	2.24	----------	1.88	.85	1.59	1.64
November	----------	1.62	----------	2.31	1.19	1.61	1.68
December	1.62	----------	.66	2.41	----------	1.54	1.56

[1] Average of the years for which quotations were available. [2] Beginning Mar. 7, 1925.

Table 20 shows that in the four months when the bulk of the Virginia steers are marketed, August to November, inclusive, Good grade steers at Chicago sold on the average about $2 per 100 pounds above the price of Medium grade steers. Table 21 shows that at Jersey City the average margin in the same months ranged from $1.64 to $1.70 even though the full range of Good grade was not quoted on that market. These facts indicate that Virginia cattle producers might well give consideration to the use of supplementary feeds in connection with fattening steers on pasture, even though such feeds cost more in Virginia than they do in the Corn Belt. The use of better breeding stock and supplementing pastures with grain and other concentrates will make it possible for the Virginia cattle producer not only to market Good, and possibly Choice, steers rather than Medium grades as is now being done, but also to produce more nearly what the consumer demands and increase his chances for profit.

CONCLUSIONS AND RECOMMENDATIONS

All the information obtained on the shipments followed to market indicates that the market returns reflect the inherent characteristics of the cattle. Most of the Virginia cattle conform to the old English type first brought to this country, being rough in appearance and lacking desired beef conformation. They are slow to mature and do not finish well on grass until 3 or 4 years of age. So long as an export outlet existed, there was a good demand for them. This demand, however, no longer exists, having practically disappeared about 1912; it was revived for only a short time during the World War period.

The eastern kosher demand for heavy beef fore quarters, chucks, and plates has been the sustaining outlet for the "export" type of steers produced in southwest Virginia during the last 15 years. Aside from the kosher trade, the demand for heavy steers is from the hotel and dining-car trade which requires Good and Choice grades. The kosher trade, too, prefers these best grades. Only a very small proportion of Virginia grass cattle meet these requirements, since the bulk fall between the average and top of Medium grade.

These facts suggest that the marketing problems of Virginia cattle raisers are closely related to their production problems, and that improvement in the market situation can best be effected by improving the type and quality of the cattle raised and by supplementing pastures with grain and other concentrates. More attention should be given to the production of lighter weight cattle of good quality which yield the smaller cuts of beef that consumers now demand.

The results obtained on fed cattle in north Virginia indicate that some cattle feeding might be done in southwest Virginia, especially on farms so situated that an ample supply of feed can be produced or obtained economically. When feeding in dry lots, cattle bought during September or October could be fed during the winter months and marketed during the following spring or early summer. These should be fed out as Medium grade steers. The success of this method depends mainly on the seasonal rise in the price of this grade of steers. If steers of higher grade were fed it would be preferable to market later in the summer. In feeding cattle for the summer market it seems advisable to feed less grain during the winter and finish on grass, supplementing the grass with grain, thus improving the finish of the cattle and possibly advancing the marketing date. This would also result in more economical production.

With the type and age of cattle now generally used, the practice of maintaining steers during the winter with large quantities of concentrates does not seem the most economical, especially if the steers are carried through the full grazing season, since neither grade nor selling price of the steers followed through the market showed any significant effect of the quantity of grain fed during the previous winter. If these cattle had been "topped out" earlier in the season they possibly would have shown more effect of the grain feeding. The Bureau of Animal Industry has found in three experiments with similar steers that an advantage of 100-pound gain in weight as a result of winter feeding was reduced to only 41 pounds after 136 days on grass. In other words, if one lot of steers weighed 100 pounds per head more as the result of better winter feeding, than another lot of steers similar in all other respects, the difference in weight would be reduced to 41 pounds after 136 days on the same pasture.

Under the present system of finishing on grass alone, effort should be made to winter aged steers as economically as possible as the main object is to maintain thriftiness and body weight. Corn silage and some dry roughage appear to be the cheapest and most satisfactory ration with which to do this. When wintering young steers it is not only highly desirable to keep them thrifty but also to keep them growing, for it is essential that they continue to grow so as to attain the desired finish during the grazing season. Young steers are efficient utilizers of roughage, but for the best development they need a protein feed like clover hay or cottonseed meal.

It was found in both north and southwest Virginia that weight and age of the steers formed an important factor in determining the economy of gains. The effect of age was least noticeable with silage-fed steers. The light, nonsilage steers in southwest Virginia and the light-fed steers in north Virginia made much cheaper gains than did the heavier, and probably older animals. The margin necessary to pay all costs was much less in both cases. At times market conditions are such as to favor the production of heavy cattle in spite of their inefficiencies in the utilization of feed, but these favorable periods are infrequent and irregular, thus making it more or less of a gamble to attempt to take advantage of them. Age therefore is an important factor to be taken into consideration for the most economical utilization of the available pastures and the most satisfactory market returns.

For the slow-maturing type of cattle now commonly produced it would seem profitable to deviate from the usual custom and purchase grazing steers one year younger than those usually bought. A young steer of the slow-maturing type may tend to put most of his gain in growth rather than to develop the desired degree of finish for slaughter purpose. The total weight gain would probably be about the same, but from a market standpoint it is desirable that the steers fatten. If the grass matures properly they probably will attain the desired finish, but in most cases some grain feeding on grass is necessary to obtain the best results.

Grass-finished steers from southwest Virginia, when strictly mature, often become a liability. After reaching a maximum finish they often "go back" or the fat becomes "patchy"; either condition lowers the value of the animal. If the steers are held too long they are expensive to maintain and at this stage are uneconomical utilizers

of grass. Frequently they are held on a declining market. This was especially true in 1923, 1924, 1928, and 1929. The seasonal high prices for slaughter steers from this section are obtained usually during the spring and early summer months. Unless conditions warrant a different procedure, steers that are ready for market during the early summer should be "topped out" and sent to market. This may be advisable for several reasons even if they have not reached their maximum finish: (1) Their total value may be more at this time than if sold on a declining market later; (2) it leaves grass for the unfinished steers that can utilize it more economically; and (3) it lessens the risk of all the cattle being forced on a glutted market at any one time or at the end of the grazing season and is a means of averaging or lessening market risks. Large graziers can do this readily, but small producers may find it necessary to make cooperative shipments.

Orderly marketing should be one of the goals of the producers in the Appalachian area who finish cattle for slaughter. Approximately 72 per cent of the slaughter cattle from southwest Virginia in 1922 were marketed during August, September, October, and November; 96 per cent moved during these months in 1923, and 94 per cent in 1924. Approximately 85 per cent of these steers graded from average Medium to low Good, and were marketed at a time when Medium grade grass cattle are marketed in greatest numbers throughout the whole country. It is not surprising that at this season of the year Medium grade steers at Jersey City often sell considerably below such grades at the Chicago market.

Cattle marketed from Virginia and West Virginia are usually loaded so as to arrive at the market at least one day before they are offered for sale. The cattle followed through the Jersey City market were unloaded an average of 36 hours before being sold. The average fill taken on by these cattle during the time they were held in the yards amounted to 64 pounds per head. This is an excessive fill, probably double the average fill on the Chicago market. A heavy fill lowers the dressing percentage, therefore experienced buyers naturally make an allowance for such fills in making purchases, otherwise they could not realize costs. This accounts in part for the price differential between live cattle of the same grades at Jersey City and Chicago.

As a rule carloads of steers received at Jersey City from Virginia run fairly uniform as to weight and grade, but often there is a "light end" and occasionally a stag or a bull in the load. Shippers would profit by loading a car with cattle that are as uniform in quality as possible, for inferior animals have an adverse psychological effect on prospective buyers and afford a talking point for beating down prices.

The practice of contracting for cattle in advance of delivery as generally followed in Virginia and West Virginia is not conducive to improvement in the quality of the stock. The actual selling qualities of the stock are overlooked, weight being the only object in view when cattle are contracted at a given price margin. Contracting cattle in advance encourages bulk-weight production and tends to cause the grazier or feeder to lose sight of quality and of the fact that it is important that he keep informed in regard to market conditions and demands. He does not know the market selling price or how his cattle grade, and he is not able to compare them with the cattle with

which they compete. The unsatisfactory conditions incident to the marketing of cattle in this section may be attributed largely to the contract system and its inevitable result—bulk production without regard to quality.

It is highly desirable that the individual grazier or feeder ship his own cattle to market if possible in order that he may become familiar with the actual market conditions which his stock have to meet. In some sections cooperative shipping is advisable. The practice of paying a commission to a friend or neighbor who is better acquainted with livestock shipping does not lead to the most efficient production and marketing system. A personal study by each livestock producer of the existing marketing system, market conditions, and consumer demands would lead to more efficient production and more orderly marketing. If every producer followed the market more closely and kept informed as to the grade and market value of his product, there is reason to believe that a more united effort would result in an improvement in the entire marketing and production situation in the sections embraced in this bulletin.

SUMMARY

The production of beef cattle on pasture has long been an important industry in Virginia. The leading cattle-producing sections in the State are southwest Virginia, the Shenandoah Valley, and north Virginia. The 34 counties in these three sections had 78 per cent of all the beef cattle in the State according to the 1925 census.

In southwest Virginia steers are purchased as feeders in the fall and after grazing on pasture until early December are wintered on shock corn, hay, and silage. In late April they are turned on grass and are grazed until ready for market in the late summer or early fall.

In the Shenandoah Valley and in north Virginia the feeder steers are purchased in the fall, but the more common practice in these sections is to feed more liberally on shock corn, cottonseed meal, silage, and hay in dry lot, for 75 to 110 days and market them during the winter. Such cattle compare about equally with the "short-fed" or "warmed-up" steers of the Corn Belt. The usual practice in all three sections is to have steers ready for slaughter at 3 to 5 years of age and weighing, at markets, from 1,250 to 1,500 pounds.

From 1870 to 1912 many of these steers were exported alive to England, but after 1912 this export trade practically disappeared. The large export trade in fresh beef which the Nation enjoyed during this time also dwindled to practically nothing after 1912, although it was restored temporarily during the World War period. Virginia cattle that are not used for local consumption now find their chief outlets in the large consuming centers north of the Potomac River. The principal markets to which they are shipped are Baltimore, Lancaster, and Jersey City. A limited number are sent to Richmond. Cattle going to Lancaster are mostly purchased for further feeding in Pennsylvania and Maryland feed lots. Those going to Baltimore and Jersey City are usually bought for immediate slaughter.

Loss of the export trade in cattle and beef, and changes in cattle numbers resulting from the operation of the cattle-production and cattle-price cycles, together with changes in consumer demand and changes in cattle-production methods in other sections of the country have all resulted in creating new and difficult problems for Virginia

cattle producers. To meet these problems and place their industry on a more profitable basis, producers apparently must make some readjustments in their production methods. Improving the grade by use of better breeding stock and by feeding some grain or other concentrates during the grazing season appears to offer possible means of bettering conditions. To market steers at younger ages is desirable.

In marketing their cattle, Virginia graziers who operate on a large scale frequently consign their steers to the public markets, but the more common practice of the other graziers is to sell at home to local buyers who ship to market, or to representatives of slaughterers located in the large eastern cities. In many instances the local buyer or packer representative is also a large-scale grazier. Frequently the local buyer furnishes the feeder cattle for grazing and contracts to buy them back at the end of the grazing season. Contracting for cattle several months in advance of delivery has been a common practice for many years.

The railroad facilities available to the livestock shipper are usually the most important factor in determining his choice of a market. The railroad system that serves the stockmen in southwest Virginia provides direct transportation to Lancaster and Jersey City, hence most of the cattle shipped from that section are consigned to these two markets. On the other hand the system that serves most of the stockmen in the Shenandoah Valley and in north Virginia provides direct service to Baltimore, and this accounts for a large proportion of the shipments from this territory going to that market.

Railroad records show that for the three years, 1922–1924, cattle shipments from southwest Virginia averaged almost 2,500 cars annually. During this period about one-third of the shipments were sent to Jersey City and New York. Approximately 12 per cent were consigned to slaughterers in Philadelphia, and almost 40 per cent went to Lancaster and other points in Pennsylvania. Less than 2 per cent were shipped to Baltimore. Virginia's contributions to Lancaster's car-lot receipts of cattle have ranged from 20 to 30 per cent annually. Cattle shipments from Virginia to Jersey City for sale comprise, on the average, about 30 per cent of the total receipts at that market which are offered for sale. West Virginia furnishes about 13 per cent of the total for sale at that market.

The bulk of the cattle marketed from Virginia are shipped during a comparatively short period each year. The grain-fed cattle from north Virginia and the Shenandoah Valley are marketed from early December to the middle of March. Most of the cattle in the State, however, are fattened on grass, and these are marketed mostly from mid-August to late November. The marketing period for the grass-fed cattle may be advanced or delayed, depending upon pasture and market conditions, but the former factor is the more important. A prolonged rainy season usually prevents the cattle from acquiring the desired finish and thus delays the marketing period. On the other hand a dry summer hastens the curing of the grass, and the steers are made ready for market early. Ordinarily Virginia and West Virginia contribute about 70 per cent of the cattle on sale at Jersey City during the 12 weeks following August 15, and during this period about 80 per cent of the shipments from southwest Virginia move to market. Approximately 90 per cent of the receipts from Virginia at Lancaster arrive in the second half of the year.

Cattle fattened in the feeding district of Lancaster, Pa., are marketed from April to June, inclusive, or, when there are practically no shipments moving to market from Virginia or West Virginia.

Records obtained on the operations of a number of graziers in southwest Virginia showed that about 75 per cent of their steers were wintered on shock corn, hay, and straw. The others were wintered on silage and lesser quantities of grain and dry roughage. The quantity of corn and other feeds fed per steer on different farms varied considerably. On some farms steers received as much as 20 bushels of corn per animal; on other farms they were fed very little grain.

The quantity of corn fed per steer before going on grass in the spring averaged 6.5 bushels where silage was used, and 13.9 bushels where the roughage was mostly hay and corn stover. Steers receiving silage also received, in addition to the corn, an average of 48 pounds of other grain and concentrates, 592 pounds of hay, 1,033 pounds of corn stover, and 653 pounds of straw. The quantities of silage fed during the period averaged 3,447 pounds. Steers not receiving silage were given an average of 1,501 pounds of hay, 1,665 pounds of corn stover, 711 pounds of straw, and 93 pounds of grain and concentrates other than corn.

On the basis of values prevailing at the time the records were taken the wintering feed cost was about $4.75 per steer lower for steers that received a silage ration with a limited quantity of corn than that for steers fed larger quantities of corn, and roughages consisting mostly of hay and corn stover. There was but little variation in the other costs, and this margin in favor of steers wintered on silage was maintained throughout the wintering and grazing periods.

The average daily gain in weight per steer during the entire season was practically the same for each method of wintering, amounting to 0.8 pound. The total gain for the entire season averaged approximately 300 pounds. The cost per 100 pounds gain for steers receiving silage, however, was $2.31 lower than for steers wintered mostly on shock corn, hay, and straw.

Records obtained in north Virginia and the Shenandoah Valley were on steers fed in dry lot for a period of about 90 days. During this period these steers received about the same total quantity of hay and other roughages as was fed to steers in southwest Virginia wintered on silage. They received considerably more silage and concentrates, and their average daily gain in weight was two and one-half times as great, amounting to 2.03 pounds. The cost per 100 pounds gain in weight was slightly higher than for the grass-finished steers in southwest Virginia, but this was partly because of the higher unit cost of corn.

Although the records obtained were hardly sufficient in number to allow general conclusions to be drawn with regard to the advantages and disadvantages of using light and heavy feeder steers, there were indications that lighter steers make gains in weight at lower costs than do heavy steers. This was particularly true for the steers fed in the Shenandoah Valley and north Virginia and those in southwest Virginia that did not receive silage.

Grass-finished steers in southwest Virginia, held on the farm for an average of 341 days, made a greater daily and total gain in weight than did steers kept an average of 378 and 424 days respectively, and the cost per 100 pounds gain was less for the steers held for the shorter

periods. Likewise steers fed for an average of 60 days in dry lot in north Virginia made a greater average daily gain than did those fed approximately 100 days, and the cost of gain per 100 pounds was less.

Shipments of steers followed to market averaged about 18 to 20 animals per car. Gross shrinkage in transit averaged about 9 per cent of home loading weights. The time in transit averaged 55 hours to Lancaster and 64 hours to Jersey City. The steers had access to feed and water for an average of 40 to 50 hours after arrival at market before being offered for sale. This enabled them to regain about half of the weight lost in transit and reduced the net shrinkage to an average of 4 to 5 per cent. There were wide variations, however, in both gross and net shrinkage.

Excluding shrinkage, average total marketing costs for steers from southwest Virginia amounted to $183.64 per car, $10.12, per head, and 70 cents per 100 pounds shipping weight. Freight cost was the largest single item, averaging $128.12 per car, with the rate ranging from 53 to 55½ cents per 100 pounds arrival weight. Commission charges were $1.25 and yardage 40 cents per head. Steers shipped from north Virginia and the Shenandoah Valley to Jersey City were marketed at a cost of $160.38 per car, $8.06 per steer, or 60 cents per 100 pounds shipping weight. The lower cost as compared with that for the steers shipped from southwest Virginia was due primarily to a difference of about 10 cents in the freight rate as a result of the shorter haul.

Steers shipped from southwest Virginia to Lancaster were marketed at an average cost of $166.88 per car, $8.31 per steer, or 65 cents per 100 pounds shipping weight. Freight costs were slightly lower as were also yardage and feed costs at market. Lower feed costs were due to smaller quantities of hay fed as well as lower unit costs.

Marketing costs on cattle purchased by packers at Chicago and shipped to Jersey City or New York for slaughter approximate about 63 cents per 100 pounds. This includes only buying commission, freight charges, and cost of feed in transit. The cost on shipments from Kansas City to New York is about 90 cents per 100 pounds.

The yield of beef from steers marketed at Jersey City from southwest Virginia averaged 56.3 per cent of their sales weight; the carcasses averaging 773 pounds. The range in dressing percentage was 53.55 to 58.5 per cent, with approximately 70 per cent of all the steers ranging between 55 and 57.5 per cent. Steers from north Virginia and the Shenandoah Valley yielded a slightly smaller proportion of beef to live weight, their dressing percentage averaging about 55.2 per cent. The lighter weight of these steers and a slightly greater fill at markets account for their lower dressing percentage.

Steers from north Virginia graded slightly higher, both alive and in the carcass, than those from southwest Virginia. Approximately 85 per cent of the latter graded from average Medium to low Good; the remainder graded down to the low end of Medium with a few steers grading as low as Common. Those from north Virginia and the Shenandoah Valley graded from average Medium to average Good, a large proportion being in the upper range.

Virginia cattle marketed at Jersey City are slaughtered mostly for the kosher beef trade of New York City. The fore-quarter beef which meets the kosher requirements is consumed by the orthodox Jews and the hind quarters are sold to the non-Jewish trade. The requirements and peculiarities of the kosher trade are an important

price-determining factor for Virginia cattle, and variations in the demand of this trade resulting from the occurrence of Jewish feast and fast days need to be considered by shippers of cattle to the Jersey City and New York markets. New York City takes about 10 per cent of the total beef of the country obtained from federally inspected slaughter and almost 20 per cent of the steer beef. Ordinarily it requires the beef from approximately a million cattle, excluding calves, to feed its large population each year, but it is a very discriminating market and prices there vary widely according to quality.

Although slaughterers at New York and Jersey City buy a large proportion of their cattle at Chicago and other mid-western markets, the Chicago prices for steers of the same grade as those offered for sale at Jersey City are higher than Jersey City prices slightly more than half of the time. Ordinarily Jersey City prices are higher than Chicago prices only when heavy steers sell at a premium over lightweight steers. Excessive fills at Jersey City, as a result of the long time that cattle are held on feed and water before they are offered for sale, and frequently undesirable characteristics which make the beef from these cattle difficult to sell in a discriminating market like New York, account in large part for the fact that Jersey City cattle prices are often lower than those at Chicago.

Since most of the beef cattle produced in Virginia and West Virginia are finished on grass and are marketed in the late summer and fall, they enter into competition with the large supplies of grass cattle produced in other sections of the country which are marketed at this time of year. Furthermore they are forced to meet the increasing competition from the grain-fed cattle of the Middle West, most of which are younger in age and lighter in weight and dress out beef that is higher in quality and finish. The increasing demand on the part of urban consumers for the better grades of meat and for small cuts, which can be obtained from yearlings and lightweight steers, makes it difficult to sell beef of the grade and carcass weights obtained from the type of steers commonly marketed off grass from Virginia.

Heavy steers ordinarily sell to some advantage over lightweights in the kosher trade, however, and for this reason Virginia grass steers command a higher price than the lighter-weight western grass steers of comparable grade. New York dealers who handle beef from Virginia cattle attempt to substitute it for beef from grain-fed steers, but such attempts often bring complaints from customers because a considerable percentage of the beef from Virginia steers is darker in color than the beef from steers fattened on grain. About 25 per cent of the steers from southwest Virginia, which were followed through the slaughter plants, dressed out beef that was dark in color. Such beef usually has to be sold at a discount below that which is of a bright-red color, and this is a factor that must be taken into account by Virginia cattlemen in meeting the competition from grain-fed cattle.

The factors that account for the differences in the color of beef have not as yet been definitely determined although various opinions prevail as to the reasons for color differences. Those who have had experience in the handling of beef generally agree that it is impossible to determine before slaughter which animals will yield beef that is dark in color, and they state that, as a rule, the color can not be determined from the external appearance of the carcass. It is only

when the flesh is cut so as to expose the internal muscular tissues that the color can be determined accurately.

Possibilities of improving the grade and market value of their cattle by supplementing pasture with grain and other concentrates during the grazing season appear to offer the best way of increasing the returns to Virginia stockmen. Experiments conducted over a period of three years by the Bureau of Animal Industry and the West Virginia Experiment Station indicate that steers wintered according to the usual practices in Virginia and West Virginia, but given supplemental rations of corn and cottonseed meal while on grass during the grazing season, made an average gain in weight 37 per cent greater than did steers that were on grass alone.

The feeding of grain to steers that were on grass increased their selling price about 10 per cent over the price paid for strictly grass-fed steers, and the profits from the grazing operations were 20 per cent greater where grain was thus used. One of the significant developments of the experiment was the fact that better results were obtained with feeder steers of Medium grade than those of Good grade. The steers on grass that received grain acquired more finish and improved in quality over those fattened on grass only, consequently they commanded a higher price on the market.

Records for nine years show that in the months when Virginia grass cattle are usually marketed, Good grade steers at Chicago sell at an average of $2 per 100 pounds higher than do Medium grade steers, and that at Jersey City the differential in favor of Good grade steers is about $1.64 per 100 pounds. Improving the grade of his steers by the use of grain enables the producer to obtain this additional margin in price. Feeding of grain to cattle on grass makes it possible to have them ready for market earlier in the summer, when a higher price level is usually prevailing; thus the selling at a date near the low point of the decline, which ordinarily takes place as the season advances, is avoided.

In general the marketing problems of Virginia cattle raisers are closely related to their production problems. Improvement apparently can best be effected by improving the type and quality of their cattle by the use of better breeding stock, by giving more attention to having cattle ready for market at younger ages and lighter weights, and by improving the grade by supplementing pasture during the grazing season with grain and other concentrates.

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