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ECONOMIC ASPECTS OF THE BEEF CATTLE INDUSTRY

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FOREWORD

This bulletin represents the results of a study undertaken at the request of various beef cattle interests of California. The primary object has been to analyze the chief statistical data relating to the beef cattle industry.

Those interested in specific topics relating to the industry are asked to consult the table of contents (p. 2). For those who wish to quickly obtain the conclusions set forth in the body of the publication, the summary found in the first few pages will be helpful.

ACKNOWLEDGMENTS

Especial thanks are given to the officers and members of the California Cattlemen's Association and the Western Cattle Marketing Association for their cooperation in the collection of much of the basic data appearing in this publication. Valuable suggestions and important contributions have been made by W. E. Schneider, United States Department of Agriculture, Bureau of Agricultural Economics, and Professor Arthur W. Sampson, Forestry Division of the College of Agriculture, University of California. The Cattle Protection Service of the California State Department of Agriculture, and the Animal Husbandry Division of the College of Agriculture, University of California, have also aided materially. Mention should be made of the statistical calculations made by Linton T. Kirby and George H. Garner, students in the College of Agriculture of the University of California.

SUMMARY

California cannot be detached from the other western states in any consideration of the beef cattle industry. In addition, a view of the national and world situations must be obtained in order to understand present domestic conditions and to formulate future policies.

The total number of cattle and calves in the United States has declined 23.8 per cent (trend data) during the eight years, January 1,

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1920–January 1, 1928. On the latter date estimates indicated fewer cattle on farms and ranges than at any other time since the beginning of the century with the exception of January 1, 1912. Both 1912 and 1928 represent low points in cattle-production cycles. In the eleven western states the decrease (22.8 per cent) has been approximately the same as that for the nation. Unlike the trend in the United States and in the other western states, the cattle population of California has changed but slightly during the past eight years, a decrease of approximately 1 per cent having taken place (trend values). Low points in numbers were reached in 1925 and 1926, an actual increase being recorded since the latter date.

Considering only beef stock, decreases in the United States and the western states have been greater than for all cattle. Cows over a year old kept for milk purposes have actually increased. While this same movement has taken place in California during 1926 and 1927, there was also an actual increase in the number of animals "other than milk cows."

Although California must depend upon outside sources for an appreciable amount of its cattle supplies, offerings originating within the state during the grass season are at times more than ample to supply the demand for slaughter. Seasonal offerings are naturally dependent on the weather and the six months beginning in April are those of comparatively heavy supplies from within the state.

The larger local supplies, particularly during June, July, and August, have the effect of lowering the market during these months. The removal of the surplus from the market during the grass cattle season appears to be one method by which an improvement can be brought about in the market for California beef cattle. This objective can be accomplished partially by supplemental feeding and by extending the marketing period over more time or by the development of markets outside the state.

Supplies of cattle were light and values were high in the period prior to the outbreak of the European War. With an increase in supplies, cattle values showed a steady decline until the low point was reached in both the nation and state in 1923. From then until 1926, there was a steady increase in the average value of cattle sold. Considerable acceleration in values was shown during the latter part of 1927 and the first ten months of 1928.

During the past few years there has been a widening of the spread between the market values of the better grades of slaughter animals on the one hand, and the less desirable on the other. This situation

has created an increased interest among cattlemen in the marketing of their stock in a well-finished condition, and during the last few years the finishing of cattle, particularly with such feeds as cottonseed cake, has apparently gained ground in California. The number of feeder cattle shipped into California since 1922 has increased more rapidly than that of slaughter cattle. This movement for the marketing of cattle in a well-finished condition should relieve some of the competition that has existed on the markets between the unfinished beef stock, often of poor quality, and the cull stock from dairy herds. This would bring about a more favorable situation for both classes of producers.

The widening of the margin between good and poor cattle is but a reflection of the consumer demand for the better cuts of beef. Since the War, consumers throughout the nation have been willing to pay relatively more for the better cuts and relatively less for the poorer cuts as compared with the period before the War. Educational work directed toward a more effective use of the cheaper cuts of beef might stimulate profits in beef production.

At the present time there is an apparent lessened supply of cattle throughout the world. There does not seem to be any likelihood of beef being imported into this country in important quantities, since an embargo exists against Argentine beef. A few small shipments of live cattle from Canada have entered the country. Shipments of live cattle and fresh beef from Canada to the United States were materially increased during 1927. Indications point to an increase in the importations of feeder cattle from Mexico in the near future.

From the present outlook abroad, conditions do not warrant an expansion of the cattle industry beyond which the supplies would be forced to seek an outlet abroad. While indications point to some curtailment of supplies in certain other countries, it is entirely probable that the world outside of the United States will be in a position to replace these. Furthermore, world prices at present (September, 1928) have not shown as great a tendency to rise as have those in the United States.

With the improvement in cattle prices and the relatively low production of 1927, it seems highly probable that the industry is now at the low point of the present production cycle in the United States. Prevailing conditions are similar to those in 1913. These cycles in the past have extended over a period of fourteen to sixteen years. The previous low point in numbers of cattle in the United States was in 1912.

The high and low points in numbers of cattle in California have not corresponded with those in the United States. The low point in numbers in California occurred in 1926, or two years earlier than in the country as a whole, the previous low point having been in 1914.

From now on it is expected that the trend of production in both the state and nation will be gradually upward for several years to come. The small numbers of cattle in the country coupled with the relatively high prices which have prevailed for several months past are expected to provide a strong incentive for cattlemen to re-stock farms and ranges and to increase their herds. However, the expansion of the beef cattle population during the next two or three years may be slow, because stock cattle are high in price and many of the ranges which have been cleared of cattle have been largely occupied by sheep. Cattlemen should attempt to avoid the vicious production cycles which have occurred in the past and they should proceed to increase herds conservatively. While from the long-time viewpoint the cattle situation appears favorable, the California cattlemen, on account of the seasonal demand, should make such increases as can be marketed when the demand is relatively great, as during the late fall and winter months.

The population of the nation and state is increasing. At the present time the nation is practically self-sufficient in its beef supply and there is not room for as proportionately great expansion in the industry as there has been at times in the past. History indicates that as countries grow older and the urban population increases, the per-capita consumption of meat decreases. The established cattleman in California with suitable production facilities ought to be in an especially favorable position to increase his production slightly. It is not sound for novices to enter the business at the high prices now prevailing. During periods of remunerative prices there is always the tempetation to overstock. On account of the serious depression through which the industry has passed since the War the cattlemen should be urged to put their businesses on a sound financial footing. It is highly probable that cattle prices will remain on fairly high levels until 1930 or 1931, and if history repeats itself, prices will then go lower.

DEVELOPMENT OF THE BEEF CATTLE INDUSTRY

United States.—Cattle were first brought to the new world by the Spanish in the sixteenth century and by the settlers on the eastern shores of the present United States in the seventeenth. The movement of cattle from the more thickly settled to the sparsely inhabited sections of the country began in early colonial days. Stock raising in every one of the colonies was primarily a frontier activity, and in colonial times this frontier had moved from the coast, until in the middle of the seventeenth century it was at the head of river navigation, or the "fall" line.[3] This frontier at the time of the Revolution included the back country of New England, the Mohawk Valley in New York, the Monongahela Valley of Pennsylvania, the Shenandoah Valley and the Piedmont region of Virginia and the Carolinas.

After the Revolution, migration of cattle to the Ohio Valley took place on a large scale with a resulting shift in the center of beef production. With the building of canals and railroads cattle moved westward until in 1840 the center of the cattle population was about fifty miles north of Charleston, West Virginia.

In the period before the Civil War, cattle began to move in large numbers into Texas and the states west of the Mississippi (table 1, p. 8), including California, although large numbers were already in the latter state before the American occupation in 1848. By 1860 the center of beef production had moved to a point in western Kentucky.

The development of the range cattle industry on the Great Plains from 1870–1885 forms an important epoch in the cattle history of the nation (table 2, p. 8). By 1880 the Dakotas and the mountain and intermountain states were but sparsely stocked with cattle, but by 1894 nearly all of the western territory was occupied and stocked close to its capacity. In 1900 the center of beef production had moved westward to a point in eastern Kansas.

Since 1900 the mountain and Pacific states have tended to increase the relative number of all cattle within their borders, while the other sections of the country have either kept the same relative positions or have experienced relative declines. This is more noticeable when an attempt is made to differentiate between dairy cattle and all other cattle. By 1920 the center of beef production had shifted to a point in western Kansas.

[3] Clemen, R. A. The American livestock and meat industry. 872 p., 36 fig. The Ronald Press Co., New York, 1923.

TABLE 1

CATTLE ON FARMS—NUMBER OF ALL CATTLE, UNITED STATES, 1850–1925

(Thousands, i.e., 000 omitted.)

Division and state	1850	1860	1870	1880	1890	1900	1910	1920	1925
United States	17,779	25,620	23,821	39,676	57,649	67,719	61,804	66,653	60,760
Geographic divisions:									
North Atlantic states	4,712	5,204	4,946	5,797	5,462	6,340	5,569	5,190	4,428
North central states	4,373	7,249	8,355	15,834	24,601	30,621	27,467	31,071	28,861
South Atlantic states	4,180	3,951	2,939	3,952	3,890	4,432	4,839	4,703	4,135
South central states	4,163	7,724	6,520	9,716	14,500	17,871	14,664	14,658	12,646
Western states	350	1,491	1,061	4,377	9,195	8,456	9,265	11,031	10,690
Montana			37	428	1,443	968	943	1,269	1,322
Idaho			10	191	219	364	454	715	606
Wyoming			11	521	934	687	767	875	783
Colorado			71	791	1,167	1,433	1,128	1,757	1,436
New Mexico	33	89	58	348	1,632	992	1,082	1,300	1,267
Arizona			5	136	928	743	825	822	1,069
Utah	13	34	39	133	278	344	412	506	504
Nevada		5	32	217	211	385	450	356	419
Washington		28	47	198	255	395	402	573	582
Oregon	42	154	120	598	521	700	725	851	784
California	263	1,180	631	815	1,608	1,445	2,077	2,008	1,918

NOTE.—Data for 1925 and 1920 relate to January 1; for 1910, to April 15; and for earlier years, to June 1. Figures for censuses prior to 1900 were nominally exclusive of calves.

Sources of data: 1850–1920. Dept. Commerce, Bur. Census. Cattle on farms—number of all cattle. Fourteenth Census. U. S. **5**: 572. 1922. 1925—Dept. Commerce Bur. Census, Livestock on farms, Dept. Commerce, Bur. Census. United States Census of Agriculture: Summary Statistics by States, **1925**: 28-37. 1927.

TABLE 2

PERCENTAGE DISTRIBUTION OF ALL CATTLE ON FARMS, UNITED STATES, 1850–1925

Division and state	1850	1860	1870	1880	1890	1900	1910	1920	1925
North Atlantic states	26.50	20.31	20.76	14.61	9.47	9.36	9.01	7.79	7.29
North central states	24.60	28.29	35.07	39.91	42.67	45.22	44.44	46.61	47.50
South Atlantic states	23.51	15.42	12.34	9.96	6.75	6.54	7.83	7.06	6.81
South central states	23.42	30.15	27.37	24.49	25.15	26.39	23.73	21.99	20.81
Western states	1.97	5.82	4.45	11.03	15.95	12.49	14.99	16.55	17.59
Montana			0.16	1.08	2.50	1.28	1.53	1.90	2.18
Idaho			0.04	0.48	0.38	0.54	0.73	1.07	1.00
Wyoming			0.05	1.31	1.62	1.01	1.24	1.31	1.29
Colorado			0.30	1.99	2.02	2.12	1.83	2.64	2.36
New Mexico	0.19	0.35	0.24	0.88	2.83	1.46	1.75	1.95	2.09
Arizona			0.02	0.34	1.61	1.10	1.33	1.23	1.76
Utah	0.07	0.13	0.16	0.34	0.48	0.51	0.67	0.76	0.83
Nevada		0.02	0.13	0.55	0.37	0.57	0.73	0.53	0.69
Washington		0.11	0.20	0.50	0.44	0.58	0.65	0.86	0.96
Oregon	0.24	0.60	0.50	1.51	0.90	1.03	1.17	1.28	1.29
California	1.48	4.61	2.65	2.05	2.79	2.13	3.36	3.01	3.16

Source of data: Computations by authors based upon table 1.

During the past eight years, 1920–1928, all cattle and calves have decreased. This decrease has been general over the entire nation (table 5, p. 17).

From the very beginning of the cattle industry there has been a tendency for it to push westward. Within the past few years this has been the result of a lesser number of beef cattle in the east rather than of an actual increase in the west. With the settlement of the west and the industrial development of the Pacific section of the country it is doubtful whether this western movement can continue.

California.—Cattle ranching, the first industry in California, was founded by the Franciscan padres, who brought approximately 200 cattle into the state in 1769 when the mission at San Diego was founded. Cattle raising was fostered at all of the missions and the animals ran unmolested except for the round-ups. The sun-dried hides furnished the leather for clothing and harness, sewing, rope-making and shoes, while the fat went into the making of soap or candles. Meat was a commodity of little or no exchange value outside of the immediate needs of each community. The government and private individuals owned some cattle, but so few as not greatly to affect the aggregate. In 1778 the mission books show that there were 500 cattle in California, while in 1800 there were 74,000. In 1834, the number of cattle under mission control reached 423,000.[4] This number was perhaps less than that for the previous decade. Between 1820 and 1830 certain authors[5] state that the number of mature cattle possessed by the missions was well above one million. With the secularization of the missions a general slaughter of the cattle for hides took place. The census of 1850 showed returns for slightly over 250,000 cattle. By far the larger number (approximately 80 per cent) of these were reported from the coast counties of Los Angeles, Santa Barbara, and Monterey. From an examination of the incomplete records available it is evident that the period 1850–1860 was one of phenomenal growth in the cattle industry of California, the greater part of which seems to have occurred during the five years 1855–1860. Cattle began to enter southern California from Texas during the former year.

In 1860, the census showed cattle to be fairly well distributed over the state (tables 10 and 11, p. 22), the south coast and the Sacramento

[4] Dept. of the Interior. Report on the productions of agriculture. Report on cattle, sheep and swine supplementary to enumeration of livestock on farms in 1880. pp. 74–76. 1883.

[5] Soule, Frank, and John H. Gibon. The annals of San Francisco. 824 p. D. Appleton and Co., New York. 1855.

Valley areas each containing approximately 25 per cent of all the cattle in the state. Southern California, the San Joaquin Valley, and the north coast section followed, each with about 15 per cent of all cattle reported. The mountain section reported only 3 per cent of the cattle in 1860.

Estimates point to 1862 as being one of the peak years in the cattle population of California, with 3,000,000 head ranging in the state.

In 1864, a severe drought reduced or destroyed great numbers of cattle. The permanent settlement of the state gave prominence to farming, and the pastoral life, which occupied large tracts for cattle and sheep, with a sparsely settled country and comparatively limited production, began to pass away. The census returns for 1870 gave evidence of a great decrease in the total number of cattle, although both the San Joaquin Valley and mountain counties became relatively far more important (table 10, p. 22).

Attention should be directed toward errors in using mere numbers of animals in making comparisons (see p. 24). This is perhaps more clearly brought out by comparisons of grass-fed cattle in 1855 and 1880 on California pastures made by the late Henry Miller of the firm of Miller and Lux.[6] Changes have been made in both the method and time of taking the census, which also accounts for a considerable percentage of errors.

During the past fifty years there has been no definite or pronounced shifting of cattle within the state. Generally speaking, the north and south coast sections and the Sacramento Valley have decreased in relative importance while the San Joaquin Valley and southern California have gained (table 11, p. 22). A considerable part of the increase in the two latter areas has come about through

[6] Estimated weight of grass-fed cattle in 1855 and in 1880 on California pastures:

Age	Net weight 1855 pounds	Net weight 1880 pounds
Yearlings	250–400	400–500
Two-year olds	350–400	550–600
Three-year olds	400–450	600–650
Beeves	450–500	750–800

From Dept. of the Interior Report on cattle, sheep and swine supplementary to enumeration of livestock on farms in 1880. U. S. Dept. Interior, Report on the productions of agriculture, pp. 74–76. Government Printing Office, Washington, D. C. 1883.

the large accessions made to the dairy-cow population in both of these areas. A very large factor in the reduced numbers of cattle in the north coast section of the state, is that sheep have replaced cattle. Many of the north coast ranges are far better adapted to sheep production than to cattle production. Originally this was a sheep territory, but the coyotes drove the sheepmen out. More recently the Biological Survey has cleaned up the coyotes and the swing is back to sheep. The relative fluctuations in the mountain counties have been larger than in other sections, but there has not been a pronounced tendency for either an increase or a decrease in relative importance.

All Cattle and Calves, Including Milk Cows and Heifers, United States, January 1, 1928

Fig. 1.—In considering the beef supply of the United States, the entire cattle population should be taken into account. The Mississippi Valley states, together with the North Atlantic and New England states, contain a dense cattle population. When compared with figure 2 it will be seen that the cattle population of the northeastern section of the nation is primarily used for milk production. 1 dot = 20,000 cattle.

(Data from table 1, p. 8.)

GEOGRAPHIC DISTRIBUTION OF THE CATTLE POPULATION

United States.—On January 1, 1928, the north central states claimed over 46 per cent of the total number of cattle in the United States (fig. 1). While differentiation between cattle used for milk

purposes and beef is especially difficult to make in this area, estimates indicate that this same area contained over 52 per cent of the milk cows of the country. On the addition of the north Atlantic states to this area the percentage of total cattle is raised to over 54 and that of milk cows to nearly 65. Population exerts an influence on this distribution, on account of the economic advantages of producing market milk in proximity to centers of human population (figs. 1 and 2).

All Cattle and Calves, not Including Milk Cows and Heifers, United States, January 1, 1928

Fig. 2.—The states west of the Mississippi River contain the larger number of cattle other than milk cows. Compare with figure 1. The states east of the Mississippi contain relatively few cattle used primarily for beef purposes, when compared with the western area. Points on the broken line have the same freight rates for cattle to the San Francisco and Los Angeles markets, on one hand, and to the Kansas City and Omaha markets on the other. 1 dot = 20,000 cattle.

(Data calculated by authors from U. S. Dept. Agr. Crops and Markets 5(2): 39–40. 1928. The number of milk cows and heifers in each state was subtracted from the total number of cattle.)

Numerically the south central states are second in importance in the cattle population (fig. 3). In this area by far the greater number of cattle is found in the two states of Texas and Oklahoma.

Scattered over the eleven western states is approximately one-sixth of the cattle population of the country. The number of milk cows in this section is increasing rapidly, and on January 1, 1928 it contained approximately 9 per cent of the total milk cows in the nation.

NUMBER OF CATTLE IN THE UNITED STATES BY GEOGRAPHIC DIVISIONS

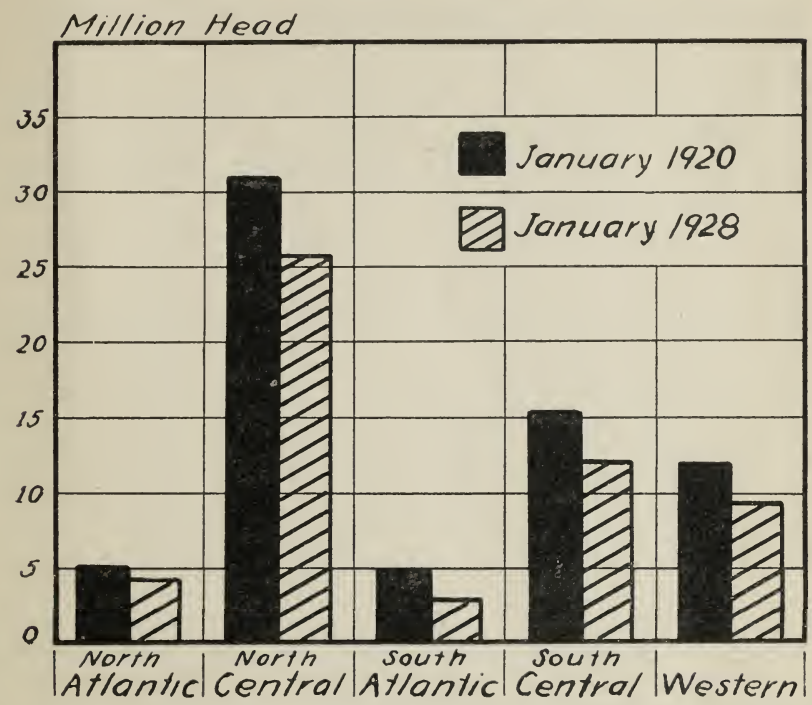

Fig. 3.—The cattle population decreased in every section of the United States between 1920 and 1928. The western group of states contained 16.9 per cent of all the cattle in the United States. California is included in the western states and contains about 21 per cent of the cattle in this group. Of the cows used for milk purposes, California has approximately 30 per cent of the total number in this group. (Data from table 5.)

TABLE 3

PERCENTAGE OF TOTAL FARMS IN CERTAIN SUBDIVISIONS OF THE UNITED STATES REPORTING BEEF CATTLE AND COWS MILKED, 1925

Subdivision	Per cent of farms reporting beef cattle	Per cent of farms reporting cows milked
New England states	6.2	77.4
Middle Atlantic states	10.0	81.2
East north central states	22.8	88.8
West north central states	58.0	89.3
South Atlantic states	28.0	66.0
East south central states	31.2	76.5
West south central states	35.4	71.9
Western states	46.2	72.7
Pacific states	12.8	61.7
California	10.8	48.1

Source of data: Calculations by authors based upon returns of 1925 Farm Census.

ALL CATTLE AND CALVES, INCLUDING MILK COWS AND HEIFERS, CALIFORNIA, JANUARY 1, 1928

Fig. 4.—The largest numbers of all cattle are found in the San Joaquin Valley. This area also contains the largest number of dairy cattle. Cattle within the state destined for the main markets of San Francisco and Los Angeles must come from considerable distances. Dairy cattle have been taking the place of the strictly beef animals in the vicinity of the larger cities, and this movement will probably continue. 1 dot = 5,000 cattle.

(Data from E. E. Kaufman, Agricultural Statistician, U. S. Dept. Agr., Bur. Agr. Econ., cooperating with California State Dept. Agr., Sacramento, Calif.)

California.—The San Joaquin Valley contains approximately one-third of the cattle of the state (fig. 4). While cattle production is of first importance in the northern and eastern mountain counties they contain only about 10 per cent of the total number of cattle in the state. On account of the movement of cattle during the year the cattle population of these counties necessarily varies. Almost equal numbers are found in the southern part of California, south coast counties, Sacramento Valley, and north coast counties.

TABLE 4

PERCENTAGE OF FARMS IN CALIFORNIA REPORTING BEEF CATTLE AND COWS MILKED, 1925

Subdivision	Per cent of farms reporting beef cattle	Per cent of farms reporting cows milked
California	10.8	48.1
North coast counties	14.0	63.5
South coast counties	11.2	43.2
Sacramento Valley counties	18.4	53.0
San Joaquin Valley counties	8.1	55.9
Southern California counties	5.2	31.9
Mountain counties	49.4	72.7

Source of data: Computations by authors on basis of 1925 Farm Census.

TREND IN CATTLE RAISING

Numbers of Cattle in the United States.—Until comparatively recent times cattle of the beef and dairy breeds were not clearly differentiated, and thousands of the former are still used as milk cows. Furthermore, census data in the past have distinguished between "dairy cattle" or "milk cows" and "other cattle." Just how much dependence can be placed on "other cattle" as a measure of beef cattle is not known.[7] "Other cattle" includes that portion of the dairy population not actually producing milk at the time the census figures were collected. Hence dairy bulls, dry cows, young heifers, and steers, of dairy blood would be included in the list of "other cattle," while under the term "milk cows" were included many cows of beef breeding. Further complications arise from the fact that the dates of the census enumeration are not the same for each census year. In addition, the beef animal of today is far more highly developed

[7] Wentworth, Edward W. The changes in the center of beef production. Armour and Co's Monthly Letter to Animal Husbandmen. 2 pp. Nov. 1, 1921.

than formerly (p. 24). It is, therefore, not strictly accurate to make comparisons of numbers of "other cattle" over a period of years as has often been done.

Even though the basic figures of cattle population were dependable in themselves, they are inadequate for the purpose of determining the trend of production. They are only annual inventory figures, and these without any allowances for changes in turnover when there has been a great change are very apt to lead to erroneous conclusions.

TOTAL NUMBER OF CATTLE, 1900–1928, AND NUMBER OF CATTLE OTHER THAN MILK COWS, 1920–1928, UNITED STATES

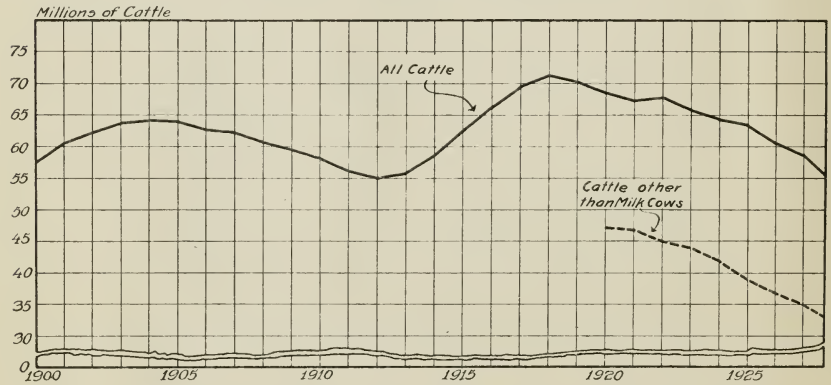

Fig. 5.—The statement is commonly made that the production cycle of cattle in the United States is from 14 to 16 years in length. From revised cattle-populations statistics it will be noted in the above figure that there is only one production cycle. The period between the peak years, 1904–1918, is 14 years. Undoubtedly 1928 will be found to be a low point, and if this is the case the period between the low points 1912–1928 is 16 years. From 1928 onward for a few years probabilities are that the cattle population will increase. Compare with cycles of value (fig. 20, p. 68). It should be noted that the number of cattle other than milk cows has decreased more rapidly since 1920 than the total number of cattle. Revised data have been furnished to the authors by the U. S. Dept. Agr. They are believed to be substantially accurate, but publication is not yet authorized.

(Data from table 5 and from calculations made by authors.)

While the census data are valuable in showing changes of a most general nature, it is difficult if not impossible to obtain from them information relative to trends and cycles of the cattle population. Estimates of the year to year changes based upon census data have been made by the United States Department of Agriculture[8] (table 5).

[8] Roberts, John. Food animals and meat consumption in the United States. U. S. Dept. Agr. Cir. 241: 1–22. 1926. Later revision of data sent to author from John Roberts, Oct. 14, 1927.

TABLE 5

ESTIMATED NUMBER OF ALL CATTLE AND CALVES ON FARMS AND RANGES, UNITED STATES, JANUARY 1, 1920–1928

(Thousands, i.e., 000 omitted.)

Division and state	1920	1921	1922	1923	1924	1925	1926	1927	1928
United States	68,871	67,184	67,264	66,156	64,507	61,996	59,122	56,872	55,696
North Atlantic	5,190	5,079	5,054	4,923	4,709	4,475	4,396	4,369	4,471
North central	31,111	29,976	29,836	29,991	30,128	29,207	28,260	26,490	25,738
South Atlantic	4,978	4,907	4,744	4,615	4,432	4,217	3,895	3,746	3,801
South central	15,426	15,419	15,546	14,938	13,820	13,266	12,368	12,432	12,275
Western	12,166	11,803	12,084	11,689	11,418	10,831	10,203	9,835	9,411
Montana	1,370	1,269	1,380	1,360	1,360	1,340	1,280	1,152	1,117
Idaho	715	675	685	685	705	650	624	605	588
Wyoming	950	859	898	881	825	795	787	771	764
Colorado	1,757	1,683	1,680	1,614	1,540	1,465	1,377	1,418	1,317
New Mexico	1,700	1,800	1,900	1,500	1,350	1,290	1,213	1,189	1,070
Arizona	1,150	1,135	1,090	1,138	1,116	1,069	863	705	546
Utah	556	535	525	550	540	507	482	472	472
Nevada	456	436	445	460	440	419	385	350	343
Washington	613	583	587	587	586	582	558	530	519
Oregon	891	828	846	834	814	796	716	687	680
California	2,008	2,000	2,048	2,080	2,142	1,918	1,918	1,956	1,995

Sources of data: 1920–1924, U. S. Dept. Agr. All cattle and calves, U. S. Dept. Agr. Crops and Markets **3**: 38. 1926. 1925–1927, U. S. Dept. Agr. All cattle and calves. U. S. Dept. Agr. Crops and Markets **4**: 42. 1927. 1928, *ibid* **5**: 39. 1928.

TABLE 6

PERCENTAGE DISTRIBUTION OF ALL CATTLE AND CALVES ON FARMS AND RANGES, UNITED STATES, 1920–1928

Division and state	1920	1921	1922	1923	1924	1925	1926	1927	1928
North Atlantic states	7.54	7.56	7.51	7.44	7.30	7.22	7.44	7.68	8.04
North central states	45.17	44.62	44.36	45.33	46.71	47.11	47.79	46.57	46.20
South Atlantic states	7.23	7.30	7.05	6.98	6.87	6.80	6.60	6.59	6.83
South central states	22.40	22.95	23.11	22.58	21.42	21.40	20.92	21.86	22.03
Western states	17.66	17.57	17.97	17.67	17.70	17.47	17.25	17.30	16.90
Montana	1.99	1.89	2.05	2.06	2.11	2.16	2.16	2.03	2.01
Idaho	1.04	1.00	1.02	1.04	1.09	1.05	1.06	1.06	1.06
Wyoming	1.38	1.28	1.34	1.33	1.28	1.28	1.33	1.36	1.37
Colorado	2.55	2.51	2.50	2.44	2.39	2.36	2.33	2.49	2.36
New Mexico	2.47	2.68	2.82	2.27	2.09	2.08	2.05	2.09	1.92
Arizona	1.67	1.69	1.62	1.72	1.73	1.72	1.46	1.24	0.98
Utah	0.81	0.80	0.78	0.83	0.84	0.82	0.82	0.83	0.85
Nevada	0.66	0.66	0.66	0.70	0.68	0.68	0.65	0.62	0.62
Washington	0.89	0.87	0.87	0.89	0.91	0.94	0.94	0.93	0.93
Oregon	1.29	1.23	1.26	1.26	1.26	1.28	1.21	1.21	1.22
California	2.92	2.98	3.04	3.14	3.32	3.09	3.24	3.44	3.58

Source of data: Computations by authors based upon table 5.

Recently the Bureau of Agricultural Economics has tentatively revised all previous yearly estimates. These data are plotted in figure 5. While the exact data have not yet been made public, the trend as depicted is probably more accurate than that which can be obtained from available statistics. The plotted data represent "all cattle," as difficulties are encountered in endeavoring to separate beef and dairy animals.

TABLE 7

ESTIMATED NUMBER OF CATTLE AND CALVES ON FARMS AND RANGES, MINUS THE ESTIMATED NUMBER OF COWS AND HEIFERS OVER ONE YEAR KEPT FOR MILK PURPOSES, UNITED STATES, 1920–1928

(Thousands, i.e., 000 omitted.)

Division and state	1920	1921	1922	1923	1924	1925	1926	1927	1928
United States	43,026	41,621	41,453	39,946	38,115	35,320	33,011	31,006	29,573
North Atlantic states	1,203	1,188	1,222	1,059	958	810	833	868	910
North central states	18,185	17,072	16,697	16,629	16,555	15,226	14,430	12,933	12,182
South Atlantic states	2,880	2,820	2,656	2,516	2,347	2,180	1,933	1,801	1,790
South central states	10,612	10,765	10,884	10,247	9,142	8,621	7,968	7,943	7,669
Western states	10,146	9,776	9,994	9,495	9,113	8,483	7,847	7,461	7,022
Montana	1,192	1,088	1,195	1,168	1,151	1,117	1,053	936	908
Idaho	569	526	526	520	525	452	423	397	375
Wyoming	885	791	828	806	748	715	703	687	677
Colorado	1,511	1,443	1,430	1,364	1,281	1,193	1,106	1,130	1,025
New Mexico	1,630	1,724	1,819	1,422	1,277	1,215	1,136	1,111	991
Arizona	1,106	1,099	1,048	1,093	1,069	1,022	823	660	502
Utah	469	449	434	454	437	399	373	362	357
Nevada	439	418	425	439	417	394	359	324	317
Washington	315	280	281	266	261	242	228	202	194
Oregon	651	590	610	586	551	527	458	429	420
California	1,379	1,368	1,398	1,377	1,396	1,207	1,185	1,223	1,256

Sources of data: Computations by authors based upon the following: 1920–1924, U. S. Dept. Agr. All cattle and calves, U. S. Dept. Agr. Crops and Markets **3**: 38. 1926. 1925–1927, U. S. Dept. Agr. All cattle and calves, U. S. Dept. Agr. Crops and Markets **4**: 42. 1927, 1928, ibid. **5**: 39–40. 1928.

From the evidence presented, the actual numbers of all cattle on hand increased at a rapid and regular rate from the close of the Civil War until 1894. The rate of growth was apparently equal to that of the human population. Since the latter date the human population has grown far more rapidly than that of cattle (fig. 7). That these data are clearly not an index of output can be seen with reference to the increased productivity of American cattle herds (p. 24). In considering output attention should also be given to exports (p. 106).

Although a strict differentiation into beef and dairy cattle is impossible, such estimates as have been made point to the greater relative and actual increase of cattle kept for dairy purposes as compared with those set apart for beef. While it is probable that for a few years during the war the latter exceeded the former, the reverse

situation has been in effect during the past five years. There can be but little doubt that since 1920 the number of strictly beef animals has declined while those kept for dairy purposes have increased slightly.

TABLE 8

Percentage of the Estimated Number of Cattle and Calves on Farms and Ranges Minus the Estimated Number of Cows and Heifers Over One Year Kept for Milk Purposes, United States, 1920–1928

Division and state	1920	1921	1922	1923	1924	1925	1926	1927	1928
North Atlantic states	2.80	2.85	2.95	2.65	2.51	2.29	2.52	2.80	3.08
North central states	42.27	41.02	40.28	41.63	43.43	43.11	43.71	41.71	41.19
South Atlantic states	6.69	6.78	6.41	6.30	6.16	6.17	5.86	5.81	6.05
South central states	24.66	25.86	26.26	25.65	23.99	24.41	24.14	25.62	25.93
Western states	23.58	23.49	24.11	23.77	23.91	24.02	23.77	24.06	23.75
Montana	2.77	2.61	2.88	2.92	3.02	3.16	3.19	3.02	3.07
Idaho	1.32	1.26	1.27	1.30	1.38	1.28	1.28	1.28	1.27
Wyoming	2.06	1.90	2.00	2.02	1.96	2.02	2.13	2.22	2.29
Colorado	3.51	3.47	3.45	3.41	3.36	3.38	3.35	3.64	3.47
New Mexico	3.79	4.14	4.39	3.56	3.35	3.44	3.44	3.58	3.35
Arizona	2.57	2.64	2.53	2.74	2.80	2.89	2.49	2.13	1.70
Utah	1.09	1.08	1.05	1.14	1.15	1.13	1.13	1.17	1.21
Nevada	1.02	1.00	1.03	1.10	1.09	1.12	1.09	1.05	1.07
Washington	0.73	0.67	0.68	0.67	0.68	0.69	0.69	0.65	0.66
Oregon	1.51	1.42	1.47	1.47	1.45	1.49	1.39	1.38	1.42
California	3.21	3.29	3.37	3.45	3.66	3.42	3.59	3.94	4.24

Source of data: Computations by authors based upon table 7.

Total Number of Cattle, 1910–1928, and Number of Cattle Other Than Milk Cows. 1920–1928, California

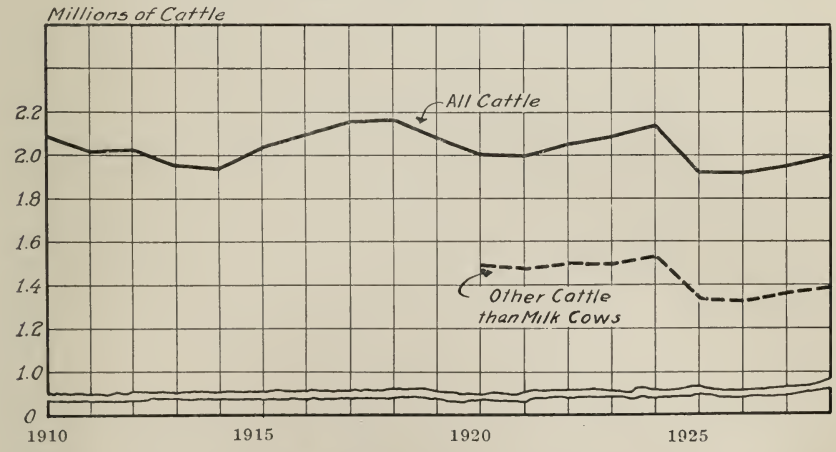

Fig. 6.—From the present evidence the movements in the cattle population of California do not correspond with those in the United States. The cattle population in California has shown less tendency to decrease than that in the nation. During 1926 and 1927 an actual increase is recorded. Since 1920, the cattle other than milk cows have decreased more rapidly than all cattle. (Data from table 9.)

Cattle Population of California.—Comparable data for the number of cattle in California previous to 1910 are not available. Census data would indicate that the cattle industry of the state has more than held its relative place in the industry of the country as a whole during the past seventy-five years. Since 1910 the number of all cattle in the state has been remarkably stationary with the exception of the three years 1917, 1918, and 1924 (fig. 6). A considerable drop occurred during the latter year, owing no doubt to the prevalence of the foot and mouth disease.

With the increase in the number of milk cows in the state there has unquestionably been a reduction in the number of animals kept for strictly beef purposes. Since 1920 estimates of milk cows have been made. The number of cattle other than milk cows shows a distinct decline since the latter date (tables 7 and 8). While data over such brief periods of time do not take account of cyclical movements, nevertheless they give an opportunity to stockmen and others to observe current changes.

Data on the consumption of beef (p. 63) and dairy products[9] would partially confirm the belief that cattle of the dairy breeds have been becoming proportionately more numerous than those of the beef breeds. The question relative to the quality of beef produced is naturally raised in connection with this movement (see p. 45). Data are available giving evidence of the poor quality of beef from dairy cattle as compared with that from animals of the beef breeds.

Cycles in Cattle Production.—Conclusions relative to the trend of the cattle population are drawn erroneously at times, owing to the failure to take into account cyclical movements, which we know have been fairly definite in the past. Revised data on the cattle population since 1900 (fig. 5) show only one well-defined cycle, although from a study of the cycles in purchasing power of cattle (fig. 20) and from a study of cattle receipts on the Chicago market, cycles in numbers of animals have existed for a long period of time. From all of the available evidence the cattle cycle seems to cover a period of from 14 to 16 years. With improved methods of management and feeding and the consequent placing of cattle on the market at an earlier age, this period may in the future be shortened.

From 1900 to 1904, there was a distinct upward movement in cattle population. This latter date agrees closely with that for the low point in values. From 1904 to 1912 a downward movement in

[9] Voorhies, Edwin C. Economic aspects of the dairy industry. California Agr. Exp. Sta. Bul. 437: 64–72. 1927.

numbers is perceptible, which was followed by a rise reaching a high point in 1918. Since the latter date there has been a distinct downward trend. If it were possible to eliminate all but strictly beef animals these movements would be even more pronounced. The high point in values did not occur until 1915 (fig. 20). Comparatively high inventories of cattle for five years, 1918–1922, forced values to low points, the low point apparently having been reached on January 1, 1925. Since the latter date valuations have been going up while numbers have been moving in the opposite direction. At present the trend in cattle numbers has started to rise, and if history repeats itself this upward trend should continue for a few years. (Compare with data relative to cycles in the purchasing power of beef cattle, p. 67, and fig. 20, p. 68).

TABLE 9

Number of all Cattle in California, January 1, 1910–1928; Milk Cows and Other Cattle, January 1, 1920–1928

(Thousands, i.e., 000 omitted.)

Year	All cattle	Year	All cattle	Dairy cattle	Other cattle
1910	2,077	1920	2,008	515	1,493
1911	2,025	1921	2,000	530	1,470
1912	2,030	1922	2,048	550	1,498
1913	1,965	1923	2,080	580	1,500
1914	1,940	1924	2,142	595	1,547
1915	2,037	1925	1,918	579	1,339
1916	2,098	1926	1,918	596	1,322
1917	2,156	1927	1,956	596	1,360
1918	2,171	1928	1,995	602	1,393
1919	2,083				

Source of data: 1910–1927 given to authors by E. E. Kaufman, State Statistician, State Dept. of Agriculture, Sacramento, Calif., Oct. 11, 1927. 1928, U. S. Dept. of Agr. Crops and Markets 5: 39–40. 1928.

Information for California is not available on numbers of cattle for a sufficiently long period of time to draw conclusions with reference to cycles in cattle population in the state. The number of cattle in the state is small compared with the total in the nation and indications are that during the past few years it has not followed the number in the nation very closely.

Prevention of Cyclical Movements.—Efforts to avoid the vicious influences of cycles in economic life have long occupied the attention of economists, statesmen, and others. In many of the agricultural industries control over production is difficult to accomplish on account of the large number of individual producers and on account of the dependence of agricultural production on the forces of nature. Some

of the extreme movements in the cattle industry in the past might have been averted if producers had been informed of conditions in the industry and if they had acted accordingly. High prices tend to bring on increases in herds while low prices act in the opposite direction. If by the use of widespread and accurate statistical information, cattlemen could learn to exercise the utmost caution in either increasing or decreasing herds, favorable results would accrue. *At the present time with favorable prices comes the danger of over-enthusiasm for increases in herds.* The line of growth of the dairy cow population of the country is indicative of the manner in which the cattle population might increase or decrease without bringing on extremes in production. It is true that high labor requirements have had a share in keeping dairy cattle numbers in line with the human population. Furthermore, many milk cows may be used for either beef or milk.

TABLE 10

PERCENTAGE DISTRIBUTION OF ALL CATTLE IN CALIFORNIA, 1860–1925

Section	1860	1870	1880	1890	1900	1910	1920	1925
North coast	13.27	16.30	18.92	15.75	14.88	10.30	11.19	12.17
South coast	25.57	19.98	20.65	23.61	16.07	17.91	16.19	14.55
Sacramento Valley	26.79	20.86	16.18	14.84	13.68	13.22	15.17	14.44
San Joaquin Valley	15.15	24.35	23.20	22.92	28.66	35.65	34.03	32.68
Southern California	15.93	9.05	7.03	11.69	12.68	14.09	14.05	15.99
Mountain	3.29	9.45	14.03	11.18	13.90	8.83	9.38	10.17

Source of data: Computations by authors based upon census returns.

TABLE 11

PERCENTAGE DISTRIBUTION OF "OTHER CATTLE"* IN CALIFORNIA, 1860–1925

Section	1860	1870	1880	1890	1900	1910	1920	1925
North coast	11.71	11.97	13.13	13.18	11.33	8.26	8.81	10.17
South coast	26.13	18.22	18.09	22.51	14.85	17.71	16.27	14.32
Sacramento Valley	25.96	19.63	15.51	14.41	13.49	13.02	16.11	15.93
San Joaquin Valley	14.75	29.04	29.30	25.64	32.15	37.28	33.88	32.22
Southern California	18.30	10.73	6.75	11.71	12.05	13.91	13.62	14.29
Mountain	3.15	10.43	17.22	12.55	15.96	9.82	11.31	13.07

* Other cattle=total cattle minus dairy cows.

Source of data: Computations by authors based upon census returns.

Those contemplating the building of a cattle enterprise and those already in the business should realize that if the same cyclical movements continue in the future as have existed in the past it will be absolutely necessary for cattlemen during the favorable price years to accumulate a sufficient surplus to carry over the lean years which

will perhaps come. This fact should be impressed on the consumer, who is oftentimes led to believe that the producer of livestock is piling up great wealth when wholesale prices take a perceptible advance. At this time every effort should be utilized to place the cattle business on a sound basis. During favorable years the cattleman should see to it that his fences are put in good repair, his corrals and chutes are properly constructed and in good repair, his water adequately developed, and generally speaking, all of his equipment requiring cash outlay is in A1 condition.

Changes in the Proportion of Beef and Dairy Stock.—Accompanying the decrease in all cattle and calves over the past eight years has been an actual increase in the numbers of milk cows and of heifers being retained for milk cows. On January 1, 1920, the ratio of the combined number of milk cows and heifers to the total cattle in the country was 37.6 per cent and seven years later it was 45.0 per cent. In the eleven western states corresponding data were 16.6 per cent and 23.9 per cent, and for California they were 31.3 per cent and 37.5 per cent.

The data in tables 5 and 7 bring out the contrasting trends in beef production and in dairy production in the United States, the western states, and in California. While it is not possible to make a definite segregation between the numbers of beef and dairy types of cattle, the steady increase in milk stock as against the decreases in total cattle and calves indicate that stock used exclusively for beef purposes has decreased in the eleven western states in the past eight years (table 7).

In addition to milk cows and dairy heifers over one year old, there are a large number of dairy heifer and bull calves kept on farms. Thus the total number of animals being kept incident to milk production exceeds the number represented by cows and heifers over one year old. More than one-third of the cattle and calves slaughtered in the western states originate on dairy farms and from milk stock on general farms, but a large number of these are slaughtered on farms and locally.[10] While it is true that many of these animals are of beef and not dairy stock, the dairy improvement campaign conducted by the Agricultural Extension Divisions in the eleven western states has undoubtedly served in making for a larger percentage of dairy blood in the animals being utilized for milk production.[11]

[10] Scott, G. A. Cattle in the seventeen western range states. U. S. Dept. Agr. Bur. Agr. Econ. mimeographed report issued from Salt Lake City Office, May 24, 1927.

[11] Voorhies, Edwin C. Economic aspects of the dairy industry. California Agr. Exp. Sta. Bul. 437: 1–192. 1927.

The diminishing supplies of strictly beef-type animals against the increasing supplies of slaughter stock from dairy herds, would seem to suggest that beef-cattle producers should be given an opportunity of disposing of well-finished beef at a higher premium over common beef than formerly. The situation raises problems in connection with the retailing of meat which are being partially solved (p. 45).

PER-CAPITA CATTLE POPULATION (INCLUDING CALVES), AND PER-CAPITA SLAUGHTER OF CATTLE AND OF CALVES, UNITED STATES, 1900–1927

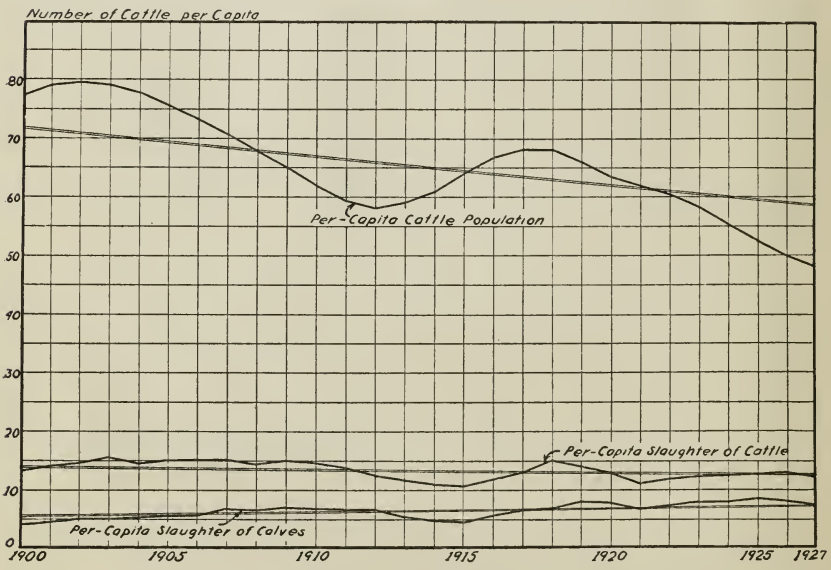

Fig. 7.—During the period 1900–1927, the number of cattle (including calves) per capita in the United States decreased approximately 18 per cent, while the per-capita slaughter of cattle decreased 10 per cent and the number of calves slaughtered per capita increased by almost 30 per cent. Compare with the per-capita consumption of beef and veal (fig. 19). (Data calculated by authors.)

Increasing Productivity of Cattle.—Comparisons between numbers of livestock are not always reliable indices for comparisons of product output. Such comparisons leave out of account the efficiency of the animals concerned. Improved methods of breeding and livestock management have unquestionably had a share in increasing the productivity of the beef herds of this country. The discrepancy between increases in numbers and actual production has been pointed out in a recent study of the dairy industry.[12] Although many factors

[12] Voorhies, Edwin C. Economic aspects of the dairy industry. California Agr. Exp. Sta. Bul. 437: 1–192. figs. 1–44. 1927.

complicate the local situation in California, indications point to an increased output per animal in this state.

The number of cattle per capita in the United States dropped from 0.718 head in 1900 to 0.589 head in 1927, a decrease of 0.129 head per capita, or 18.06 per cent (fig. 7). These values are calculated from the trend[13] of the per-capita cattle population. Comparisons between actual data for the two years in question show a decrease of over 37 per cent. The strictly beef cattle population has decreased rather rapidly, although the number of cows used for milk purposes has actually increased during this period.[14] The per-capita cattle slaughter has during the same period dropped from 0.142 to 0.127 head[15] per person, or 10.5 per cent, while calf slaughter has actually increased from 0.057 to 0.074 head per capita,[16] or 30.1 per cent.

This again indicates a decrease in the per-capita consumption of beef, which in 1900 was 67.8 pounds, while in 1927 it was 58.0 pounds. This decrease, 11.7 per cent (trend values), which is less than the reduction in total cattle slaughter, can be accounted for in part by the increased efficiency of the animals.

Lighter Weights.—Since 1893, at Chicago, there has been a distinct trend toward lighter weights for cattle. This movement has been relatively greater than in the case of any other class of livestock, being reflected in the weight of cattle slaughtered on the Pacific Coast, as will be seen from table 13.

Calf Crop.—Wentworth and Clemen[17] state there has been a decided improvement in the number of births per thousand cattle in the United States since 1907 (table 12). The question of the number of births per thousand cattle is important in many sections of California and little information is available on this point in this state.[18]

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[13] Equation of the line of trend of the per-capita beef cattle population in the United States 1900–1927 is $y = 0.6534 - 0.0046x$, origin July 1, 1914.

[14] Voorhies, Edwin C. Economic aspects of the dairy industry. California Agr. Exp. Sta. Bul. 437: 14–15. 1927.

[15] Equation of the line of trend of the per-capita slaughter of cattle in the United States, 1900–1927, is

$$y = 0.1341 - 0.0005x, \text{ origin July 1, 1914.}$$

[16] Equation of the line of trend of the per-capita slaughter of calves in the United States, 1900–1927, is

$$y = 0.06548 + 0.0006x, \text{ origin July 1, 1914.}$$

[17] Wentworth, Edward N., and Rudolf A. Clemen. Increasing productivity of American livestock herds. Armour's Livestock Bureau. Monthly Letter to Animal Husbandman 8(2): 1–4. 1927.

[18] Hart, G. H., and H. R. Guilbert. Factors influencing percentage calf crop in range herds. California Agr. Exp. Sta. Bul. 458:1–42. figs. 1–3. 1928.

In studies conducted by governmental and state agencies wide variations in the cost of producing beef have been traced to a number of factors, the most important of which has been the per cent of calf crop.[19] The claim has been made by those familiar with the economic phases of beef cattle management that the percentage calf crop should reach 80. In the studies made thus far indications are that the average calf crop in the western states studied runs below 70 per cent.

TABLE 12

Estimated Number of Births per Thousand Cattle, United States, 1907–1926

Year	Number	Year	Number	Year	Number	Year	Number
1907	253	1912	273	1917	364	1922	287
1908	268	1913	295	1918	361	1923	328
1909	267	1914	307	1919	334	1924	350
1910	303	1915	325	1920	304	1925	324
1911	275	1916	329	1921	302	1926	374

Source of data: Wentworth, Edward N., and Rudolf A. Clemen. Increasing productivity of American livestock herds. Armour's Livestock Bureau. Monthly Letter to Animal Husbandmen **8** (2): 1–4. 1927.

Some few returns on the percentage calf crop indicate that wide variations exist here as elsewhere. While certain factors of management such as an insufficient number of bulls, cows in poor conditions, etc., have an important influence on the calf crop, there appear to be other equally important factors which have not been studied thoroughly. It has been found[20] that certain large areas in Nevada report larger calf crops than other parts of the state. Investigations[21] made in

[19] Brennen, C. A., and Grant H. Smith, Jr. Preliminary report on a study of cattle production costs in Nevada. Nevada Agr. Exp. Sta. Bul. **111**: 1–14. 1928.

[20] Hilts, Walter H. A study of the 1924 calf crop in Nevada. Nevada Agr. Exp. Sta. Cir. **57**: 1–10. 1925.

[21] Klemmedson, G. S. An economic study of the costs and methods of range cattle production on forty-one ranches in Colorado in 1922. U. S. Dept. Agr. Bud. Agr. Econ., U. S. Dept. Agr. Bur. AnimalIndustry, and Colorado Agr. Exp. Sta. cooperating. Preliminary mimeographed report. Washington, D. C. April 1, 1924.

Parr, V. V., and G. S. Klemmedson. An economic study of the costs and methods of range-cattle production in the northeastern range area of Texas, 1920, 1921, 1922. U. S. Dept. Agr. Bur. Agr. Econ. and U. S. Dept. Agr. Bur. Animal Industry. Preliminary mimeographed report. Washington, D. C. April 1, 1924.

Parr, V. V., and G. S. Klemmedson. An economic study of the costs and methods of range cattle production in north central Texas. U. S. Dept. Agr. Bur. Agr. Econ. and U. S. Dept. Agr. Bur. Animal Industry. Preliminary mimeographed report, Washington, D. C. May 1, 1925.

other parts of the west have also pointed to considerable variation within the area studied. The type of forage and to an appreciable extent the degree of over-grazing as well as other managerial activites are chiefly responsible for the regional variation in calf production.

The percentage calf crop is so vital to the economic success or failure of the beef industry in this state that it should be studied carefully, although such work would have to be pursued over a long period of time to be of value. California cattlemen would benefit from whatever cooperation they might choose to give the College of Agriculture of the University of California in carrying on such investigations.

TABLE 13

Average Weight of all Cattle Slaughtered on the Pacific Coast (Calves Excluded)

Year	Weight in pounds	Year	Weight in pounds
1	2	3	4
1899	1,054	1920	1,003
1904	1,037	1921	1,057
1909	1,043	1922	986
1914	1,024	1923	996
1919	979	1924	957
1921	1,013	1925	976
1923	1,024	1926	985

Sources of data: The data for 1899, 1904, 1909, 1914, 1919, 1921, 1923 (columns 1 and 2) are from the census bureau, while the remaining data (columns 3 and 4) are from: Bur. Agr. Econ. Review of livestock market for week ending Dec. 31, 1926 (mimeographed). Bur. Agr. Econ., San Francisco office.

Seasonal Variation in Birth Rate, United States.—Cattle births are apparently more uniform throughout the year than either those of sheep or swine. Roberts[22] in a recent study of the seasonal distribution of cattle births reports that over 70 per cent of the calves are born during the first six months of the year, April claiming the largest number. An above-normal number of calves are born in March, April and May; September and October also are above normal although to a lesser degree. On many ranches the importance of procuring animals of uniform age and quality should be stressed. Often there is a wide variation in the age of calves on a single ranch.

[22] Roberts, John. Food animals and meat consumption. U. S. Dept. Agr. Cir. 241: 7. 1924.

LOCATION OF PUREBRED BEEF CATTLE BREEDERS, CALIFORNIA, 1927

Fig. 8.—The larger number of breeders of purebred beef cattle are located in the northern third of the state. While there are a considerable number in other sections, the feeding rather than the breeding of cattle becomes more important in moving southward.

(Data secured from Division of Animal Husbandry, University Farm, Davis, Calif.)

PUREBRED BEEF CATTLE

Number of Purebreds.—An enumeration of purebred cattle in 1920 indicated that approximately 3 per cent of all the beef cattle were purebred, almost the same proportion as for dairy cattle. In numbers, Shorthorns and Herefords were the leading beef breeds, representing more than four-fifths of all the pure-bred beef cattle reported—Shorthorns, 45.0 per cent; Herefords 38.1 per cent; Aberdeen Angus 10.2 per cent.

TABLE 14

Registrations of Purebred Hereford, Aberdeen Angus, and Shorthorn Cattle in California

Year	Hereford	Aberdeen Angus	Shorthorn
1911	478	17	.....
1912	493	.....	.....
1913	531	18	.....
1914	755	7	.....
1915	911	17	.....
1916	1,186	37	.....
1917	1,405	37	.....
1918	1,850	39	.....
1919	1,937	3	.....
1920	2,050	73	.....
1921	2,000	54	.....
1922	2,168	50	1,129
1923	2,080	65	895
1924	1,792	.....	841
1925	1,588	116	917
1926	1,777	.....	937

Source of data: Hereford, R. J. Kinzer, Secretary, American Hereford Cattle Breeders Association. Aberdeen Angus, W. H. Tomhave, Secretary, American Aberdeen Angus Breeders Association. Shorthorn, P. K. Groves, Secretary, American Shorthorn Breeders Association.

California contained approximately 1.24 per cent of the purebred beef animals in the country—1.28 per cent of the Shorthorns, 1.29 per cent of the Herefords, and 1.09 per cent of Aberdeen Angus cattle. A relatively larger number of both Shorthorns and Herefords in proportion to the total purebreds were enumerated in California than in the nation.

Accurate data on purebred animals recorded from California over a long period of years are not available. Data from both the American Aberdeen Angus Association and the American Hereford Cattle Breeders Association give evidence of a greatly increased number of registrations during the post-war period. It is of interest to note that

registrations of Herefords continued to increase even after the depression had set in. Shorthorn data are available since 1922 only. In the United States the trend in the registration of purebreds was downward from 1913 to 1926 (inclusive).

Location of Purebred Breeders in California.—The Animal Husbandry Division of the University of California has compiled a list of the breeders of purebred beef animals. The largest number is found in the northern third of the state, with a considerable concentration in Sacramento, Yolo, and Solano counties, the University Farm at Davis being the hub (fig. 8). The coast counties north of Mendocino and Lake counties, the Sacramento Valley north of Glenn and Butte, and the Sierra section north of El Dorado County, are relatively most important for breeding. Few feeders are shipped into this section, the number increasing toward the south (see p. 37).

Breeders of purebred Shorthorns are most numerous, followed by those of Herefords and Aberdeen Angus. This grouping corresponds to the numbers of purebred animals recorded by the 1920 census in both the United States and California.

TABLE 15

NUMBER OF BREEDERS OF PUREBRED BEEF CATTLE IN CALIFORNIA, BY SECTIONS, 1927

Section	Aberdeen Angus	Hereford	Red Polled	Shorthorn
North coast	1	5	1	23
South coast	2	21	0	20
Sacramento Valley	3	15	7	59
San Joaquin Valley	2	13	1	21
Southern California	3	6	2	20
Mountain	1	7	1	31
Total for state	12	67	12	174

Source of data: Division of Animal Husbandry, College of Agriculture, University of California.

THE IMPORTANCE OF THE BEEF INDUSTRY

United States.—According to the agricultural census of 1925 beef cattle were reported on approximately one-third (32.36 per cent) of the farms of the United States. It would be more accurate to give the data for farms with cattle but such information is not available. In 1924 cows were milked on 78.3 per cent of the farms. Cattle raising thus occupies an important place in the agriculture of this country.

In the middle western and mountain states, the number of cattle is high in comparison with the human population. On the basis of "other cattle" figures are high compared with population in Iowa, North Dakota, South Dakota, Nebraska, Kansas, Texas, and the mountain states. California has a comparatively small number of either "total cattle" or "other cattle" per human inhabitant.

TABLE 16

Estimated Gross Value of Farm Products, United States, 1919–1926
(Millions of dollars, i.e., 000,000 omitted.)

Year	Crops		Animal products	Total crops not fed and animal products	Cattle raised	Per cent cattle raised is	
	Gross	Not fed to live-stock				Of total animal products	Of total products
1	2	3	4	5	6	7	8
1919	16,561	9,402	8,275	17,677	1,578	19.07	8.93
1920	11,578	7,102	7,709	14,811	1,194	15.49	8.06
1921	7,759	4,679	5,589	10,268	786	14.06	7.65
1922	9,430	5,560	5,651	11,211	975	17.25	8.70
1923	10,401	6,111	6,271	12,382	924	14.73	7.46
1924	10,770	6,317	5,902	12,219	892	15.11	7.30
1925	10,170	6,387	6,647	13,034	919	13.83	7.05
1926	9,266	5,685	7,300	12,985	1,081	14.81	8.32
1927							

Sources of data:

Cols. 2, 3, 4, 5, U. S. Dept. Agr., Estimated gross value of farm production. U. S. Dept. Agr., Crops and Markets **4**: 251, 1927. Col. 6, U. S. Dept. Agr. Farm production, U. S. Dept. Agr. Yearbook, **1923**: 1143–1144. 1924. U. S. Dept. Agr. Estimated gross value of farm production. U. S. Dept. Agr. Crops and Markets, **1**: 84. 1924; ibid, **3**: 226, 1926; ibid, **4**: 251, 1927.

Cols. 7 and 8, computations by authors; col. 7=col. 6 divided by col. 4; col. 8=col. 6 divided by col. 5.

Beef cattle are kept on a larger percentage of farms in the west north central and mountain states than in any of the other sections of the country, while the number of farms in the three Pacific Coast states reporting beef cattle is relatively small. In both the mountain and Pacific Coast states the number of beef cows and steers per farm is large compared with the other sections of the country. Whether there has been a definite tendency toward larger or smaller units in the beef industry cannot be stated accurately. A tendency toward larger units in the dairy industry in California has recently been noted.[23]

On the basis of aggregate value, "cattle raised" ranked eighth among farm products of the United States in 1926, being exceeded by the value of dairy products, corn, cotton, swine raised, hay and

[23] Voorhies, Edwin C. Economic aspects of the dairy industry. California Agr. Exp. Sta. Bul. 437: 1–192. 1927.

forage, vegetables (including potatoes), and poultry products. The crops not fed to livestock had an estimated farm value of $5,685,000,000 while animal products aggregated $7,300,000,000 (table 16). Three major divisions comprised the animal-products group: (1) dairy products, accounting for 40.3 per cent of the animal products' total; (2) animals raised, 42.0 per cent; (3) poultry products, 16.2 per cent. Wool, together with minor products, made up the remaining 1.5 per cent. Of the animals raised ($2,672,000,000) swine made up 53.8 per cent of the total, cattle 34.4, sheep 6.6, horses and mules 5.0, and miscellaneous 0.2 per cent. It should be noted that under "cattle raised" would be included those produced for dairy purposes, a large number of which ultimately reach the block.

There has not been a definite trend in the place which cattle raising has occupied in the agriculture of the United States or in its position among the animal products. However, it would appear from table 16 that the depression in 1920 and 1921 was felt more severely in cattle raising than in agriculture in general or in the other animal industries. If in the data in table 16 dairy cattle could be separated from beef cattle, the latter would occupy a place of lesser importance.

California.—Annual estimates of the value of production of cattle, hogs, and sheep are now being made by the Division of Crope and Livestock Estimates. These estimates[24] for California, representing the gross farm value of livestock sold off farms and ranges during 1927, are as follows:

Cattle and calves	$26,419,000
Sheep, lambs, and wool	$21,395,000
Hogs	$15,264,000

The value of cattle and calves produced was exceeded by the value of butterfat produced and by the value of poultry products. Compared with specific crops produced, the former value was exceeded only by hay, grapes, and oranges.

The 1925 agricultural census reports beef cattle on 10.84 per cent of the farms of the state and cows milked on 48.11 per cent. While cattle raising is of direct importance to perhaps a smaller percentage of farmers in California than in most other sections, farming is more highly specialized in this state. In the number of "beef cattle per farm keeping beef cows" in 1925, California ranked fourth among the states, while in the number of "steers per farm keeping beef cows" third place was taken.

[24] California Cooperative Crop Reporting Service. Estimated value of the production of California livestock—1927. California Crop Report 1927: 55. 1928.

In comparison with other types of agriculture, beef raising is more important in the mountain group of counties than in any other location. In the percentage of farms keeping beef cattle this section was followed in order of importance by the Sacramento Valley, north coast, south coast, San Joaquin, and southern California sections (table 4, p. 15). It would appear that beef raising is more important in those sections of the state possessing a relatively sparse human population. This is not the case with the dairy-cattle population, which occupies an important place in intensively cultivated sections of the state possessing a relatively large human population.

FEEDING CONDITIONS IN CALIFORNIA[25]

The Range Types of California.—The cattle ranges of California are widely diversified with respect to types of forage and grazing capacity, and in their use as breeding grounds and finishing areas, on account of differences in elevation, climate, and soil. Broadly considered, the range types occur in horizontal life zones or belts of vegetation. One or two of these zones are chiefly suitable for foraging in winter; others can best be used only for a few weeks in the summer; and a small part of the lower zones can be used throughout the year if necessary.

Four life zones are recognized, namely, Lower Sonoran, Upper Sonoran, Transition, and Boreal. The Lower Sonoran, or least elevated life zone, is the largest in extent, comprising about 36.5 per cent of the area of the state, and is characterized by such limited annual rainfall as to be classed as desert or semi-desert. In contrast, the highest, or Boreal Zone, comprises the smallest acreage, or about 4.5 per cent of the total area. It receives a large amount of rainfall, but because of low temperature and short growing season the plants have somewhat the appearance of desert vegetation. The Upper Sonoran Zone includes approximately 33.0 per cent of the land area, and the Transition Zone about 26.0 per cent (fig. 9).

The *Lower Sonoran Zone* is composed of two somewhat distinct areas, known as the Colorado and Mohave Deserts, and the Great Valley of California. This zone occurs from sea level to 5,000 feet in elevation. The Colorado and Mohave deserts are characterized by low humidity, annual rainfall not in excess of 5 inches, high summer

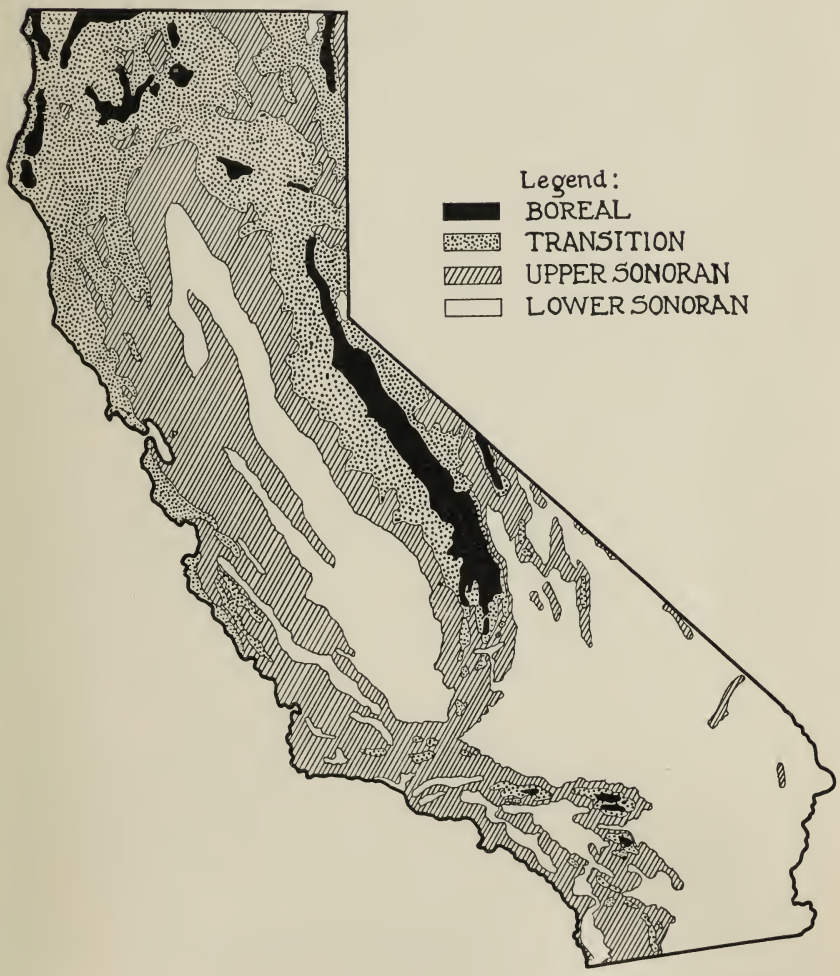
[25] At a conference of those interested in the beef industry, it was requested that a discussion of range types be included in this bulletin. In accordance with this request, Arthur W. Sampson, Associate Professor of Forestry and Plant Ecologist in the Experiment Station, University of California, has prepared the section included in pages 33 to 40.

temperature, low winter temperature, and drying winds. The vegetation is rather low of stature, widely spaced, and its forage species are succulent and highly palatable only during the short, active growing season (fig. 10). There is a goodly proportion of the green-leaved evergreens and of fleshy-stemmed plants, of practically no food value for stock. A few annual grasses and a lesser number of perennial grass species occur in somewhat protected places. Occasionally chenopods and salt bushes are found in sufficient abundance to afford valuable cattle browse feed. Arborescent species are confined to stream beds and low-lying moist areas, where they serve the all-important purpose of shelter for live-stock during inclement weather. The grazing capacity is the lowest of any zone, requiring from 60 to 100 acres or even more to support a cow for a year. There is much waste range.

The valley Sonoran, of the same range in elevation as the desert, includes most of the Great Valley of California, and is largely grassland. The rainfall is heavier than in the desert and the vegetation is more succulent and much better suited for cattle production. The tree growth is confined to moist areas and is composed chiefly of poplar and willow, the latter of which furnishes some browse feed. Large alkali flats are encountered here and there, upon which the well-known salt grass, salt bushes, and other such plants replace the grasses that do not endure salinity. Upon these areas cattle can exist and make a fair growth if fed some protein concentrate like cottonseed cake.

The *Upper Sonoran Zone* comprises the lower foothill belt of grassland and a slightly elevated chaparral belt of mixed species, between elevations of 1000 and 5000 feet. The grasses are chiefly annuals, notably wild oats, fescues, and bromes, intermixed with various highly palatable species of true clovers, alfilaria, and burr clover. Of the grasslike plants, different kinds of sedges and rushes occur in varying abundance. Among the more common brush or chaparral plants are found several species of buckbrush, manzanita, mahogany, and chamise. These often form so dense a stand as to prevent cattle from working their way into the areas to gather what little undergrowth of grasses there may be. The chaparral cover is generally regarded as the fire type for the reason that on areas frequently burned the chaparral vegetation seems to reappear indefinitely. This zone is valuable chiefly for winter and spring grazing. The grassland and open woodland areas are well suited for the grazing of cattle, whereas the browse types are utilized best by sheep and goats.

Range Types of California According to Life Zones



(After Dr. Jos. Grinnell.)

Fig. 9.—The Boreal Zone comprises about 4.5 per cent of the total area, the Transition Zone 26.0 per cent, the Upper Sonoran Zone 33.0 per cent, and the Lower Sonoran Zone about 36.5 per cent of the state.

The *Transition Zone* lies between elevations of approximately 2000 and 7000 feet and includes the forest belt of which western yellow pine, incense cedar, Douglas fir, white fir, sugar pine, and redwood are typical. This zone is of two rather distinct vegetative types—(1) the Arid Transition characterized by western yellow pine and associated species, and (2) the Humid Transition characterized by redwood. In the Arid Transition the average annual rainfall is about 30 inches. Because of the open stand of the timber, this type supports a somewhat luxuriant understory of grasses, herbs, and shrubs, of which annual and perennial fescue grasses, needle grasses, brome grasses, clovers, and other legumes are common. Of the many shrubs, huckleberry, serviceberry, mountain mahogany, deerbrush, and other buckbrushes are conspicuous. The growing season, approximately from May to November, permits grazing from late spring until the coming of the autumn rains. The Humid Transition, which comprises the coastal redwood area, has a deep, rich soil. Because of the luxuriance of the forest growth, however, this type does not support as many livestock as the more arid pine cover, except for the glades and open parks, which are of very high grazing capacity.

The transition zone as a whole contributes abundantly to the forage crop; and although the vegetation becomes somewhat dry late in the summer it remains fairly palatable and cattle hold their flesh reasonably well. For prime beef, however, the animals must be marketed before the seed crop reaches maturity. The most successful practice for beef production is to graze the forage in this zone as long as it is succulent, and then remove the animals to a more elevated zone.

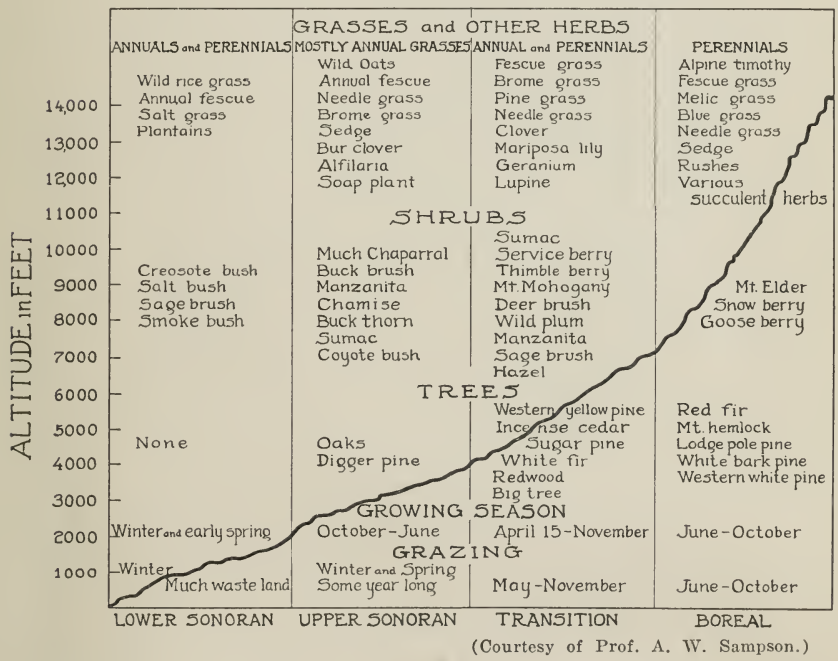
The *Boreal Zone* occurs from about 7,000 feet above sea level to the highest mountain crests. The annual rainfall is about 45 inches. The growing season and the best season for grazing is approximately from June to October. This zone may be recognized by such commercially valuable trees as red fir, western white pine, lodgepole pine, mountain hemlock, and white bark pine; by such shrubs as mountain elder, mountain mahogany, thimbleberry, wild cherry, snowberry, and mountain elder; and by forage grasses like the bromes, fescue grasses, blue grasses, pine grasses, melic grasses, and alpine timothy. Because of the heavy timber growth at intermediate elevations, the grazing capacity is variable and not especially high. The range is well watered however, so that the forage may be fully utilized.

The more elevated part of this zone comprises the cool, late summer ranges from which cattle may be marketed as beef of high quality in September and October. This area often supports many

plants poisonous to cattle, of which tall larkspur causes the heaviest losses. These losses can usually be controlled, either by grubbing out dense patches of larkspur or fencing them against the animals.

The rather limited area which lies above 10,000 feet in elevation is largely treeless—above timber line. The temperature is low and frosts may occur almost nightly during the growing period. The vegetation as a whole is of diminutive stature. Typical plants are the trisetum grasses, fescue grasses, alpine timothy, buttercup, various sedges, and dwarf shrubs. This area is of little value for livestock grazing. The period of greatest usefulness is in August.

Profile Showing the Life Zones and Characteristic Plants Found at Various Altitudes on the Range Types in California



(Courtesy of Prof. A. W. Sampson.)

Fig. 10.—This figure, together with figure 9, shows the relationship between the types of vegetation, altitude, and location of the range types in California.

Breeding and Finishing Grounds.—The difference in the conditions favoring growth tends to segregate the cattle industry into somewhat specialized fields in different localities, such as (1) merely importing, fattening, and finishing fairly mature cattle; (2) importing young cattle, growing them out, and finishing them for beef; and (3) breeding, growing, and finishing cattle and also importing many cattle from neighboring states.

SALES OF COTTONSEED MEAL, JULY 1, 1926–JUNE 30, 1927, AND LOCATION OF COTTON OIL MILLS

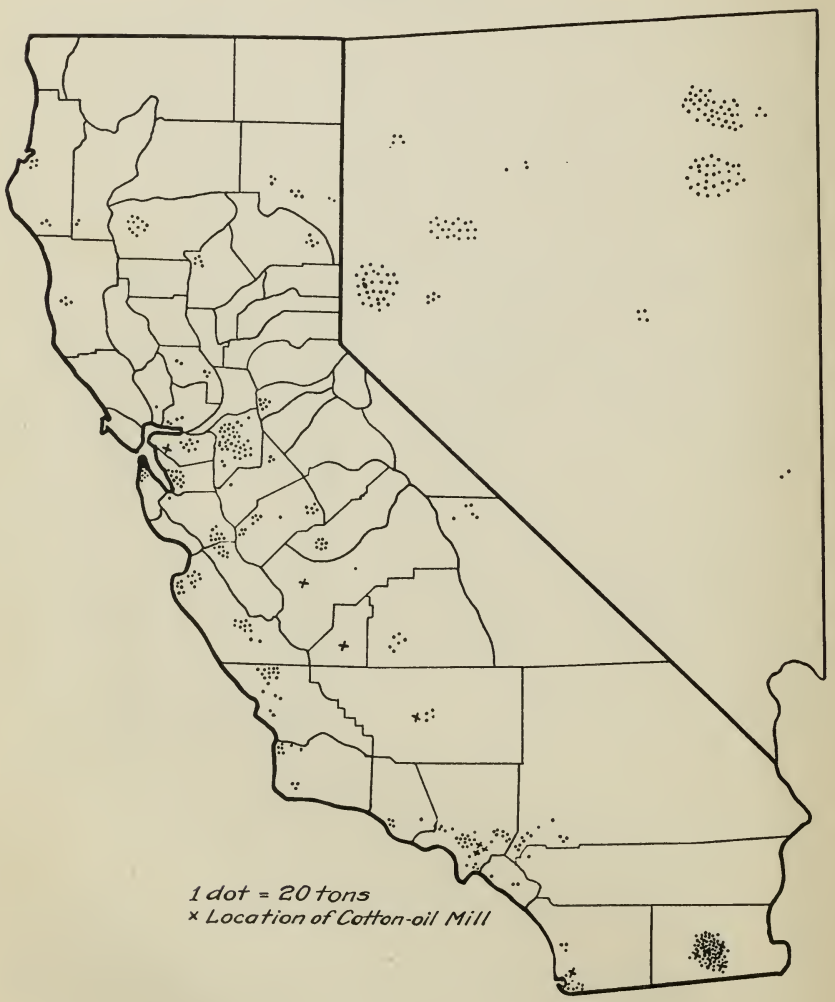


Fig. 11.—Since the advent of the cotton industry in California and Arizona, large amounts of cottonseed meal have been used for the finishing of cattle. Most of the meal is sold in the lower two-thirds of the state and in Nevada. The location of the cotton oil mills in California is shown, since a large tonnage of cake is sold locally in the vicinity of each of these mills.

(Data supplied to authors by private concerns selling approximately 75 per cent of the meal disposed of within the state.)

The whole of Imperial County and parts of Riverside and San Diego counties are highly specialized in that all of the pasture forage as well as that produced under irrigation is used for finishing the animals, practically all of which are imported from neighboring states. A new crop of animals is purchased, finished, and sold each year and the feeding is done during the more favorable winter and spring periods.

The counties on the coast from San Diego to Del Norte, east including Modoc County, and southward as far as Mono County, are used as breeding and finishing grounds with some importation of cattle, especially in years of abundant forage production. In the more northerly counties and those on the eastern border of the state, the National Forests contribute abundantly to the summer foraging requirements.

The valley counties, beginning with the narrow strip in Shasta County, southward to Kern and Tulare counties, are known as an importing, growing out, and finishing region for beef. The intensive feeding period is done in winter and spring. Not uncommonly the best beef is that which gets the use of the succulent spring forage.

Range Improvement by Reseeding.—Because of long intensive usage of the pastures many areas have been rather seriously depleted. To increase the grazing capacity and re-establish the choicest forage plants, and to maintain the productivity year after year requires definite, persistent, and rational management. Although comparatively low forage production is found in those life zones which receive limited rainfall, overgrazing and use of the forage when very young and poorly rooted are responsible for much of the low grazing capacity.

The Sonoran life zones, or foothill and valley (winter) ranges, which are well adapted for the growth of "winter annuals"—plants like alfilaria, burr clover, and wild oats, are of low productivity partly at least because of too early grazing. Generally these areas are pastured more or less heavily in the autumn shortly after growth begins, a practice unfavorable to the maintenance of a high grazing capacity if continued year after year. The plan of deferring or of discontinuing grazing sufficiently early in the spring to permit of seed development has given good promise of effective reseeding. The extent of the application of this reseeding plan is determined largely by (1) the possibilities of reserving range in the spring for the animals that are to be moved from that portion of the pasture which is in need of reseeding, or (2) where pasturage is limited, by producing supplemental roughage for the animals in order to reserve a portion of

the area for reseeding. If the area to be reserved from late spring grazing is pastured up to about March 15, there is practically no loss of forage; at the same time a fairly large seed crop of the more desirable plants is produced by June when the forage approaches maturity. The additional feed that comes from the seed produced soon increases appreciably the grazing capacity of the lands, thereby more than offsetting any disadvantage in providing the necessary spring protection. After one part of the pasture is reseeded, protection in the following spring period should be applied to another part and the grazing rotation continued indefinitely.

The deferred grazing plan applies also to the high mountain ranges; but here a portion of the summer grazing area, say one-fourth, is protected from livestock until the seed crop has ripened. After that the protected area should be grazed moderately to get the use of the forage and to trample the seed crop into the ground to insure maximum germination the following year.

In applying deferred and rotation grazing some fencing must be done to confine the animals. Not only is the cost involved usually more that offset in three or four years by more and better forage, but also the partition fences make possible segregation of the animals according to age classes and sexes, which in itself makes for bigger gains and surer profits.

Cattle-Feeding Areas.—While accurate data showing expansion in cattle-feeding areas of the state are lacking, there seems to be but little doubt that there has been a considerable increase in the feeding of concentrates during the past few years. This has been especially the case with the development of the cotton industry in the southwest, making available considerable amounts of cottonseed meal and cake. Through the courtesies tendered by one of the larger distributors of cottonseed cake in California and various cotton oil mills in the state, the authors have been able to trace the sales of cottonseed cake to cattlemen. Such sales represent over 75 per cent of the total made in the state. The main areas for such feeding are (1) San Joaquin Valley, (2) Imperial Valley, (3) areas in the San Francisco Bay and Los Angeles regions (fig. 11, p. 38). Shipments of cottonseed cake have been made on a considerable scale to points in Nevada which supply the California markets with cattle.

It is not possible to procure data relative to the amounts of alfalfa and concentrates other than cottonseed cake fed to cattle.

Cattle on Feed for Market, Western States.—The United States Department of Agriculture reports estimates of the number of cattle

on feed in various sections of the country for different times of the year. On January 1, 1928, the western states including Texas showed a decrease of 18.6 per cent in the number of cattle on feed as compared with the previous year. California cattle on feed on January 1, 1928 totaled 45,000 or a decrease of 30.7 per cent from 65,000, the number on feed on January 1, 1927. Table 17 gives the estimated numbers of cattle on feed in the western states on January 1, 1927, and 1928.

TABLE 17

Cattle on Feed for Market in the Western States, January 1, 1927 and 1928

State	January 1, 1928	January 1, 1927
Montana	38,000	43,000
Wyoming	14,000	17,000
Colorado	140,000	150,000
Utah	27,000	40,000
Nevada	20,000	28,000
Idaho	25,000	28,000
Washington	7,000	8,000
Oregon	15,000	23,000
California	45,000	65,000
Texas	50,000	50,000
Total	381,000	452,000

Source of data: U. S. Dept. Agr., Bur. Agr. Econ., Regional Livestock Office, Salt Lake City, Utah.

Feed Costs.—While the larger number of animals raised for strictly beef purposes in California are fed upon natural grasses, comparisons between the prices of feeds and beef may prove to be of interest and value to the producer. Furthermore, the purchasing power of beef in terms of feeds is of perhaps more interest than the purchasing power of beef in terms of all commodities.

Alfalfa-Beef Price Ratio.—Since 1914, there has been a wide variation in the quantity of alfalfa hay required to purchase one hundred pounds of beef. From 1914 until 1918, there was a marked increase in the value of beef cattle as compared with that of alfalfa hay. From the latter year to 1927 a definite trend in the relationship of the two commodities is not discernible.

Comparisons of Beef-Cattle and Concentrate Prices.—The relationship between beef cattle and barley prices over the past eighteen years has been irregular. No definite trend is discernible. Prices paid for cottonseed meal are not available over a sufficiently long and continuous period to give definite information on the trend of the relationship between the price of this feed and the price of beef cattle.

Grazing Fees on the National Forests.—Varying fees are charged for grazing in the national forests of the state. Table 18 contains a list of the fees charged from 1917 to 1927 and for 1931 for year-long grazing. For some years a study has been in progress which has as its ultimate aim a more equable distribution of grazing fees. The new fees will go into effect gradually, starting in 1928 and reaching full operation in 1931.[26]

TABLE 18

YEAR-LONG GRAZING FEES FOR CATTLE ON THE CALIFORNIA NATIONAL FORESTS, 1917, 1918, 1919–1927, AND MONTHLY FEES, 1931*
(Cents per animal.)

National forest	1917 yearly	1918 yearly	1919–1927 yearly	1931 monthly
Angeles	75	75	120	19
California	75	75	120	18
Cleveland	75	75	120	19
El Dorado	90	90	140	19
Inyo, Main Forest	90	90	140	18
White Mountain				17
Klamath, Eastern	70	75	100	18
Western part				15
Lassen	80	80	120	19
Modoc	75	75	120	18
Mono, Sierra	90	90	140	19
Excelsior division				17
Plumas	85	85	140	19
San Bernardino			120†	19
Santa Barbara	80	80	120	19
Sequoia, six units	90	90	140	19
High Mountain				15
Shasta	75	75	120	18
Sierra, lower slopes	90	90	140	19
Summit				15
Stanislaus	90	90	140	19
Tahoe	90	90	140	19
Trinity, main forest	70	70	100	18
New River district				15

* Prior to 1928 the monthly rate was computed by dividing the annual rate by 10 for periods of four months or longer; for shorter periods one-ninth was used. In 1931 and thereafter the method to be used is that of multiplying the monthly rate by the length of the period stock are to be grazed.

† 1926–1927.

Source of data: U. S. Dept. Agr., Forest Service, Calif. District.

SLAUGHTER OF CATTLE

Number and Trend in the United States.—The number of animals annually slaughtered under United States inspection, together with the estimated total number killed (including those on farms) is shown in table 19. The cattle and calf "curves of slaughter" (fig. 7) show

[26] Nelson, J. W. New grazing fees for California forests. Western Cattle Markets and News 1 (Special Number): 9, 29, 30. Dec. 1927.

considerable regularity. The low point in cattle marketing, 1912–1915, was coincident with an increase in the slaughter of sheep and lambs. The war conditions promoted cattle feeding for meat production and this situation was followed by a decrease at the end of the period. From 1921 to 1926 inclusive a gradual increase in the number of cattle slaughtered occurred accompanying a decrease in the

TABLE 19

Number of Animals Slaughtered Annually Under Federal Inspection and Estimated Total Number Slaughtered (Including Farm) in United States, 1907–1927

(Thousands, i.e., 000 omitted.)

Year	Cattle		Calves		Sheep and lambs		Swine	
	Inspected	Estimated total	Inspected	Estimated total	Inspected	Estimated total	Inspected	Estimated total
1907	7,633	13,287	2,024	6,211	10,252	13,360	32,885	54,709
1908	7,279	12,852	1,958	6,048	10,305	12,526	38,643	61,615
1909	7,714	13,611	2,189	6,516	11,343	14,725	31,395	53,220
1910	7,808	13,541	2,238	6,553	11,408	14,797	26,014	47,076
1911	7,619	12,958	2,184	6,265	14,020	18,057	34,133	56,646
1912	7,253	11,979	2,278	6,348	14,979	19,247	33,053	55,564
1913	6,978	11,478	1,902	5,285	14,406	18,520	34,199	57,046
1914	6,757	11,005	1,697	4,661	14,229	18,290	32,532	55,501
1915	7,153	10,822	1,819	4,640	12,212	15,756	38,381	62,017
1916	8,310	12,027	2,367	5,774	11,941	15,408	43,084	67,613
1917	10,350	13,724	3,143	7,031	9,345	12,149	33,910	56,901
1918	11,829	15,750	3,456	7,514	10,320	13,359	41,214	64,796
1919	10,091	14,838	3,969	8,445	12,691	16,317	41,812	65,190
1920	8,609	13,885	4,058	8,455	10,982	14,180	38,019	61,900
1921	7,608	12,271	3,808	7,771	13,005	16,710	38,982	62,957
1922	8,678	13,148	4,182	8,363	10,929	14,112	43,114	68,106
1923	9,163	13,883	4,500	8,824	11,529	14,862	53,334	79,843
1924	9,593	14,400	4,935	9,466	11,991	15,441	52,873	79,631
1925	9,853	14,706	5,353	10,099	12,001	15,454	43,043	68,294
1926	10,180	14,971	5,153	9,542	12,961	16,689	40,636	65,779
1927	9,520	14,000	4,876	9,030	12,883	16,589	43,633	69,250

Sources of data: 1907–1927, Roberts, John. Meat production, consumption, and foreign trade in the United States, calendar years 1907–1927. U. S. Dept. Agr. Bur. An. Ind. mimeographed circular 9 p. 1928.

number of cattle in the country. Slaughter of mature cattle is now on the decrease. During 1927 a decided decrease occurred and the first seven months of 1928 give indications of a decrease of over 10 per cent, compared with the similar period of 1927. This clearly brings out the fallacy of using the cattle population as a direct index of production. Furthermore, the composition of the cattle population (steers, cows, bulls, etc.) would have a marked influence on the actual output. Wentworth and Clemen[27] suggest that the rise in the number

[27] Wentworth, Edward N., and Rudolf A. Clemen. Livestock population and slaughter ratios. Armour's Livestock Bur. Monthly Letter to Animal Husbandmen, 7(4): 3. 1926.

of cattle slaughtered from 1921 through 1926, together with the concurrent decrease in the beef-cattle population, came about through the greater production of young cattle. Comparisons between the census data of 1920 and those of 1925 indicate that fewer animals other than breeding stock had been kept in herds despite the increased slaughter. The increase in the number of calves slaughtered has been relatively greater than that for any other class of livestock (table 19). The peak in the numbers of calves slaughtered was reached in 1925. Indications point to a decrease of about 3 per cent in 1928 compared with 1927.

Cattle are slaughtered rather uniformly throughout the year, although the high months are in the fall, October and November usually being the peak months (see p. 87, "Cold Storage Holdings of Beef"). With calves, the case is reversed, the largest slaughter occurring in April and May.

Sex Classification of Cattle Slaughtered in the United States.—Data based upon reports representing nearly 75 per cent of the total cattle slaughtered under Federal inspection show that less than 50 per cent are steers. Data are not available for a sufficiently long period to indicate whether there has been a definite trend for an increase or a decrease in the percentage. The data indicate that steers are slaughtered in relatively larger numbers during the six months, March to August, inclusive, while cows are more numerous during the remaining months of the year. A large percentage of the animals slaughtered must be of dairy origin. This may be brought out by the large percentage of cows slaughtered and by the fact that fewer cows are slaughtered when milk production is relatively high.[28]

TABLE 20

PERCENTAGE OF CATTLE SLAUGHTERED AS STEERS IN THE UNITED STATES, 1922–1928

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Avg.
1922	.....	.....	.....	.....	.....	.....	59.30	55.81	51.89	44.67	43.71	46.05	.....
1923	46.91	51.02	54.25	49.64	55.79	58.70	52.36	47.80	45.90	41.79	34.64	41.93	.....
1924	45.16	46.21	47.62	52.47	56.62	56.13	55.01	51.10	44.39	37.65	34.17	40.20	.....
1925	45.44	47.37	48.23	55.03	56.79	52.27	50.38	43.37	43.63	36.13	33.90	38.87	.....
1926	41.92	45.91	47.77	53.18	53.52	51.39	51.78	51.39	47.31	38.79	38.04	44.53	46.88
1927	45.04	49.55	50.15	50.39	57.21	51.65	52.97	50.11	49.57	36.94	35.38	39.04	47.01
1928	39.09	45.92	49.26	52.60	54.54	52.12	50.47	46.31	.....	.....	.....	.....	.....

Sources of data: Monthly reports from U. S. Dept. Agr. Crops and Markets.

[28] Voorhies, Edwin C. Economic aspects of the dairy industry. California Agr. Exp. Sta. Bul. 437: 47. 1927.

Distribution of Market Grades.—Results of an investigation carried on by the Bureau of Agricultural Economics in 1920[29] showed the estimated quantity of each grade of cattle marketed during that year to be as follows:

Cattle (Steers)	Per cent of total marketed
Choice and prime	4.5
Good	22.0
Medium	53.0
Common	17.0
Canners	3.5
	100.0

These figures would be subject to change from year to year, owing to fluctuations in market demand and conditions of production.

Grading and Stamping Beef.—The Division of Livestock, Meats and Wool of the Bureau of Agricultural Economics has been attempting to grade and stamp beef carcasses in order to supply evidence of the true grade in such manner that it will be easily distinguished by everyone, including the individual consumer.[30] The service, which has embraced prime and choice beef, consists of stamping the carcasses with a roller stamp which is run the full length so that every cut bears the evidence of official grading. The service is available at a number of points in the country. It is not universal as yet.

TABLE 21

Cattle Slaughtered in California, 1921–1927

Year	Cows	Steers	Calves	Bulls and stags	Total
1921	242,545	330,763	224,654	7,944	805,906
1922	239,409	384,786	317,564	10,001	951,760
1923	291,020	392,637	364,475	9,916	1,058,048
1924	320,909	350,528	367,477	10,504	1,049,418
1925	380,909	317,640	385,931	11,967	1,096,447
1926	383,124	369,059	437,098	12,918	1,202,199
1927	373,108	378,608	432,972	14,114	1,198,802

Sources of data: California State Dept. Agr. Slaughtering in different counties. Cattle Protection Service. Mimeographed summary reports are issued annually.

[29] Roberts, John. Food animals and meat consumption in the United States. U. S. Dept. Agr. Cir. 241: 1–23. 1926.

[30] An excellent account of this work, which was inaugurated on May 2, 1927, will be found in National Livestock and Meat Board. Grading and stamping prime and choice beef carcasses. National Livestock and Meat Board Bul. 1: 1–15. Chicago, Ill. 1927.

Number Slaughtered in California.—The total number of animals slaughtered for beef increased from 1921 through 1926 (fig. 12). During approximately the same period the total number of cattle in the state declined slightly. The demand for beef for slaughter within the state seems to have been maintained during 1927 when the second largest number of cattle (a slightly larger slaughter

TOTAL SLAUGHTER OF CATTLE (EXCLUSIVE OF CALVES) IN CALIFORNIA, 1921–1927

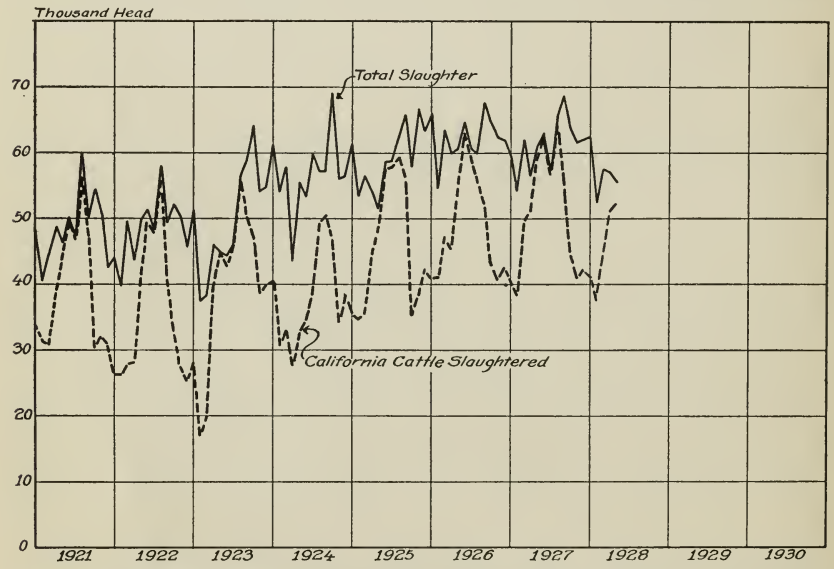


Fig. 12.—Both the total slaughter and the slaughter of cattle originating in California have increased since 1921. The total slaughter shows but little seasonal variation. California cattle give evidence of a distinct seasonal variation, since they appear on the market in the greatest numbers during the late spring and summer. (Data from table 22 and similar data not published.)

occurred during 1926) since 1921 were slaughtered at the highest prices obtained since the latter year. Slaughter of mature animals during the first six months of 1928 was 4 per cent less than that during the similar period for 1927, while calf slaughter decreased by 2 per cent during the same period.

Classification of Cattle Slaughtered in California.—During the years 1921–1926 the increase in the number of cows slaughtered was relatively greater than that for steers. More than 50 per cent of the mature cattle slaughtered during 1925 and 1926 were cows. Some of this increase undoubtedly represented reductions in beef herds. With the increasing human population and the apparent increased

consumption of dairy products it might appear that an increasingly large number of cows slaughtered would be of dairy origin. However, if improvement in the butterfat production of cows is continued, the number of cows required to supply the dairy products demanded need not be increased greatly. An increase in the butterfat production of the dairy cows of the state ought to aid the producer of beef cattle

Total Slaughter of Calves in California, 1921–1927

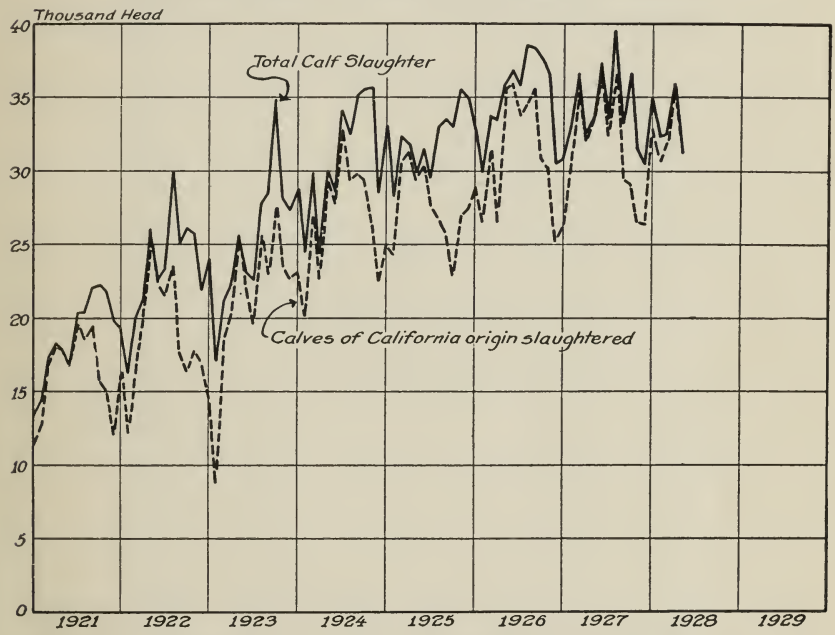


Fig. 13.—The slaughter of calves in California has increased more rapidly than the slaughter of mature cattle since 1921. There has been a tendency for a somewhat larger slaughter during the five or six months beginning in July. The larger number of calves originating in California are usually slaughtered earlier in the year, the high months being those of the late spring and summer. The slaughter of dairy calves originating in the state unquestionably has its influence.

(Data from table 23 and similar data not published.)

since fewer cows of dairy origin would be required to supply the need for dairy products. During 1927, the number of steers again exceeded the number of cows slaughtered. One contributing factor making for this change was the rise in price of beef cattle during the latter part of the year. During the first six months of 1928 the number of cows slaughtered increased by 13.1 per cent compared with the similar period for 1927, while the number of steers slaughtered decreased by 18.8 per cent.

TABLE 22

ORIGIN OF CATTLE (EXCLUSIVE OF CALVES) SLAUGHTERED IN CALIFORNIA, 1924–1927

Origin	1924	1925	1926	1927												
				Total	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Arizona	43,483	18,363	18,550	16,687	1,554	1,832	1,492	1,564	1,278	467	743	230	1,082	1,972	2,226	2,247
Colorado	9,567	7,520	1,360	2,776	851	1,017	659	26	.....	.....	.....	.....	.....	203	.....	20
Idaho	8,740	10,422	5,795	10,184	60	184	726	57	.....	.....	.....	291	2,894	2,128	2,517	1,327
Montana	8,061	3,984	5,503	3,765	818	.....	84	267	.....	.....	.....	.....	27	211	412	1,946
Nevada	53,995	54,666	61,909	50,325	8,184	7,009	6,840	2,558	441	56	134	461	3,621	5,760	8,447	6,814
New Mexico	4,221	721	119	892	276	233	.....	.....	.....	.....	.....	.....	130	29	129	95
Oregon	18,247	20,121	20,644	14,994	892	779	211	.....	.....	.....	.....	70	2,234	5,988	2,803	2,017
Texas	8,353	7,440	8,349	1,501	445	272	57	158	90	.....	.....	.....	.....	.....	.....	479
Utah	29,917	39,384	40,252	25,997	5,769	4,447	2,308	858	.....	.....	.....	23	2,213	1,962	3,516	4,901
Wyoming	684	1,466	339	2,797	.....	.....	.....	56	.....	.....	.....	20	590	528	1,457	146
Other states	26	.....	48	148*	.....	.....	.....	.....	.....	.....	.....	.....	.....	146	2	.....
Total	185,294	164,087	163,415	130,066	18,849	15,773	12,377	5,544	1,809	523	877	1,095	12,791	18,927	21,509	19,992
California	496,469	546,089	585,662	604,910	40,677	38,425	49,444	51,017	59,265	62,443	56,605	64,427	55,648	44,791	40,113	42,055
Grand total	681,763	710,174	749,077	734,976	59,526	54,198	61,821	56,561	61,074	62,966	57,482	65,522	68,439	63,718	61,622	62,047

* Includes Canada 146, Mexico 2.

Sources of data: Computations by authors based upon monthly reports (slaughter and cattle shipped into the state) issued by Cattle Protection Service, California State Dept. of Agr. There are slight differences between the above totals and those found in table 21. The totals in table 21 are perhaps more accurate. In the above, however, it was impossible to make minor corrections owing to a lack of data.

TABLE 23

ORIGIN OF CALVES SLAUGHTERED IN CALIFORNIA, 1924–1927

Origin	1924	1925	1926	1927												
				Total	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Arizona	20,946	16,323	13,223	17,775	1,200	328	84	558	95	656	752	2,135	1,747	5,076	2,787	2,357
Colorado	686	323	212	26			26									
Idaho	430	1,801	450	1,030		10	17					72	18	462	270	181
Montana	327	5	6	10											10	
Nevada	10,134	17,285	20,859	7,870	1,223	924	502	3	1	69	278	484	969	1,651	852	914
New Mexico	4,929	4,527	3,271	3,873	784	825	560						677	111	603	313
Oregon	2,462	2,019	2,302	756	19		27			152	77		250	212	16	3
Texas	5,772	12,737	2,999	1,569	1,094	40	75		24		68	135				133
Utah	1,431	2,839	2,608	1,640	169	299	103						118	233	489	229
Wyoming	32	250	3	33								21	2			10
Other states	1		10	2											2	
Total	47,150	58,109	45,943	34,584	4,489	2,426	1,394	561	120	877	1,175	2,847	3,781	7,745	5,029	4,140
California	320,376	328,177	373,779	374,353	26,323	30,522	35,121	32,050	33,541	36,278	32,428	36,609	29,509	28,939	26,526	26,507
Grand total	367,526	386,286	419,722	408,937	30,812	32,948	36,515	32,611	33,661	37,155	33,603	39,456	33,290	36,684	31,555	30,647

Source of data: Computations by authors based upon reports on slaughter in California issued by the Cattle Protection Service, Cal. State Dept. Agr. Slight discrepancies exist between the above and the totals of slaughter in table 21, because the above was computed from monthly reports, whereas the data appearing in table 21 has been taken from the yearly summaries of slaughter issued by the Cattle Protection Service.

On studying the data from California it has been noticed that the largest relative numbers of steers were slaughtered in the large urban centers of Los Angeles and San Francisco. The preponderance of cows slaughtered in the dairy sections of the state is striking.

The actual and relative increases in the number of calves slaughtered is noteworthy (fig. 13). The increase in the number of dairy cows, a trend toward younger meat animals and smaller cuts, and the relatively higher price which has prevailed for calves have been contributing factors in making for this increase. The demand for veal rather than beef is comparable to the demand for lamb rather than mutton.

Some slight confusion may exist relative to the term 'calves.' 'Calf meat' is the meat of an immature bovine animal usually between three and ten months of age at the time of slaughter. These animals generally weigh from 250 to 400 pounds and are of range birth and management. 'Veal calves' are usually not over twelve weeks of age at the time of slaughter.

Origin of Cattle Slaughtered in California.—Approximately three-quarters of the cattle (cows, steers, bulls and stags) slaughtered in California have their immediate origin within the state. No doubt, however, many of those counted as having their immediate origin within the state have come into the state as feeders. The reverse situation is also true to a limited degree. Since 1924, there has been an actual and relative decrease in the number of mature slaughter cattle originating outside of the state. Nevada, Utah, Arizona, and Oregon have sent the largest numbers of cattle into the state for immediate slaughter. The number of feeders sent into the state has shown a decided increase (p. 99). This accounts for the apparent tendency of the state to take care of its own demands for slaughter cattle.

Calves weighing from 250–400 pounds stand fairly long shipment over the railroads and appear on the San Francisco and Los Angeles markets. Out-of-state supplies have furnished from 8 to 16 per cent of the calves for slaughter in California during the seven years 1921–1927, inclusive. During this period there has not been a tendency for the proportion of receipts from out of the state to change. The largest numbers of calves shipped into California for slaughter have originated in Nevada, Arizona, Texas, and New Mexico. Rather abrupt and pronounced changes can be detected in the origin of calves slaughtered. Nevada has become increasingly important as a shipper since 1921 (except during 1927), while supplies from Texas have been proportionately less. Arizona shipments have not changed greatly.

Dairy veal calves are not usually shipped long distances, but considerable numbers are placed on the markets of the state. Large numbers of veal and calf carcasses are trucked into San Francisco from nearby sections, that is, from parts of the north coast section and interior valleys of California which are within roughly a one-hundred-mile radius. A city ordinance in Los Angeles prohibits the importation of dressed veal. All calves must come in alive and be slaughtered there, unless of course they are slaughtered under federal inspection.

Seasonal Variation of Shipments of Slaughter Cattle into California, 1921–1922
The average month = 100.

Fig. 14.—California is dependent on outside states for a considerable part of the cattle necessary to supply the demands within the state for beef. Shipments of slaughter cattle from outside the state are especially light from May until August, during which there is at times an actual surplus of cattle on the California market. During the past eight years the heaviest demand for slaughter cattle from the outside has occurred from October to March, inclusive.

(Data from table 24.)

Seasonal Variation in Slaughter, California.—No pronounced seasonal variation is evident in the slaughter of mature animals originating in California. The slaughter of animals originating outside of California shows a decided seasonal variation, the five months May to September being the low months in this connection (table 24 and fig. 14).

TABLE 24

INDICES OF SEASONAL VARIATION, CATTLE IMPORTED INTO CALIFORNIA FOR SLAUGHTER, 1921–1927

Month	Index	Month	Index
January	173.9	July	7.6
February	131.2	August	19.5
March	154.8	September	73.2
April	99.9	October	172.2
May	32.8	November	173.9
June	9.6	December	151.7

Source of data: Computations by authors based upon data as reported in the Monthly Reports of Cattle imported into California for slaughter issued by the Cal. State Dept. Agr., Cattle Protection Service. The median link relative method has been used in computing the seasonal variation. The average monthly index=100.

TABLE 25

CALF AND VEAL REQUIREMENTS OF SAN FRANCISCO, CALIFORNIA, 1922–1927

Year	Country slaughter	City slaughter	U. S. federal slaughter	Total slaughter
1922	90,112	27,208	14,721	132,041
1923	88,090	32,550	11,923	132,563
1924	69,567	41,344	14,384	125,295
1925	58,567	32,295	9,981	100,843
1926	49,883	33,075	9,730	92,688
1927	52,079	27,191	10,579	89,789

Source of data: Wm. E. Schneider, U. S. Dept. Agr. Bur. Agr. Econ., San Francisco Office.

TABLE 26

RECEIPTS OF COUNTRY DRESSED VEAL CALVES AT SAN FRANCISCO, CALIFORNIA, 1922–1927

Month	1922	1923	1924	1925	1926	1927
January	9,208	5,749	6,938	7,077	5,560	4,497
February	8,865	8,272	7,507	8,694	5,221	4,867
March	11,847	9,124	9,310	6,333	6,050	12,310
April	8,422	8,785	4,722	4,861	4,573	3,505
May	8,208	8,088	8,273	5,434	3,283	2,176
June	6,503	8,623	2,565	2,964	3,055	3,219
July	5,057	5,870	3,357	2,363	1,797	4,913
August	5,054	3,596	4,180	1,953	1,713	3,757
September	5,415	6,232	4,299	3,315	3,401	3,778
October	7,031	7,722	5,193	5,257	4,480	5,299
November	7,332	6,269	4,420	4,656	5,340	4,434
December	7,070	9,760	8,803	5,660	5,410	6,497
Total	90,112	88,090	69,567	58,567	49,883	59,252

NOTE.—Under provisions of City Board of Health all country dressed calves shipped into San Francisco must have viscera included so that adequate inspection for wholesomeness can be made.

Source of data: San Francisco City Board of Health.

From the limited data on hand, no definite seasonal movement in the slaughter of calves is evident in the state, although there is apparently a larger slaughter during the fall months of the year. The six months beginning in August show the largest slaughter of calves originating outside of the state. In general, these shipments are exceptionally light during April, May, June, and July.

An analysis of the slaughter of veal calves shows considerable variation. Data on receipts of country-dressed veal calves at San Francisco show that slaughter during the month of March is above normal (table 26), while that during the summer months is below. During the remainder of the year a pronounced tendency is not evident.

Origin of Animals Slaughtered at San Francisco and Los Angeles. —San Francisco and Los Angeles are the largest cattle markets of the state, and an analysis of the origin of the animals slaughtered in those markets together with the seasonal changes in the origin should prove to be of value. Owing to the wide areas from which California draws its supplies of cattle and the variations in climatic and feed conditions an orderly marketing of the product is highly desirable. Figures 15, 16, 17 and 18 show the origin of cattle slaughtered at San Francisco and Los Angeles during certain specific weeks of each month during 1927. The year 1927 seems to have been normal as maps of other years correspond rather closely with those for 1927. The dots represent the places of origin, while lines connect these with either Los Angeles or San Francisco, the centers of slaughter. Maps were made for each week of the year, but it is believed that those depicted in figures 15, 16, and 17 will give a comprehensive picture of the seasonal changes. Data were obtained from records of slaughter in both San Francisco and Los Angeles and these in turn were checked by the tabulations on the hide and brand inspections. During January, cattle destined for slaughter were drawn from a wide area (fig. 15). Utah, Arizona, Nevada, and Montana contributed the largest numbers. It is of interest to note that Nevada shipped almost exclusively to San Francisco. In California, shipments originated at scattering points in the Sacramento, San Joaquin, and Imperial valleys, and the northeastern mountain counties. During the next two months there was a gradual lessening of receipts from outside the state (fig. 15). San Francisco apparently received more cattle from the more northerly of the plateau states while supplies for Los Angeles were drawn more largely from Arizona, New Mexico, and California points. During April, shipments from Montana, Idaho, and Utah gradually ceased, but Los Angeles and San Francisco continued to receive supplies from Arizona and Nevada respectively. Shipments from the middle coast areas became frequent, but San Joaquin Valley points were the principal points of origin. A number of shipments were made from Sacramento Valley points (fig. 15). Throughout the year shipments originated in Imperial Valley.

Fig. 15.—Each dot represents the origin of a shipment of cattle slaughtered on either the San Francisco or the Los Angeles market, while the lines show the destination of each shipment. During the first three months of the year cattle are drawn from rather a wide area. During April the shipments begin to center within the state, few originating outside.

(Data and original maps furnished by the Western Cattle Marketing Association.)

ORIGIN OF CATTLE SLAUGHTERED ON THE LOS ANGELES AND SAN FRANCISCO MARKETS DURING CERTAIN WEEKS OF JANUARY, FEBRUARY, MARCH, AND APRIL, 1927

Fig. 16.—Except for a few shipments from Arizona, Nevada, and Texas, the state supplied its own needs for slaughter cattle during this period. Within the state the north coast section gave evidence of considerable activity during August. It should be fully realized that as climatic and feed conditions vary from year to year, shipments vary from different localities.

(Data and original maps furnished by the Western Cattle Marketing Association.)

Origin of Cattle Slaughtered on the Los Angeles and San Francisco Markets During Certain Weeks of May, June, July, and August, 1927

Fig. 17.—During the last four months of the year both markets drew heavily on cattle from Utah, Arizona, Idaho, and Nevada, and at times from Wyoming, Texas, New Mexico, and southern Oregon. Shipments from the northeastern counties of the state were frequent during this period.

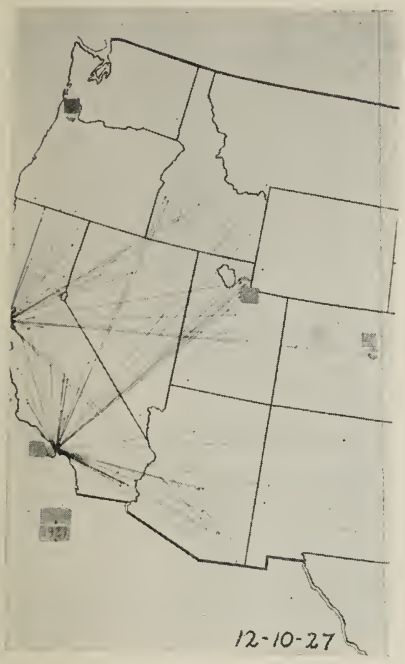
(Data and original maps furnished by the Western Cattle Marketing Association.)

ORIGIN OF CATTLE SLAUGHTERED ON THE LOS ANGELES AND SAN FRANCISCO MARKETS DURING CERTAIN WEEKS OF SEPTEMBER, OCTOBER, NOVEMBER, AND DECEMBER, 1927

Fig. 18.—Poultry is largely substituted for beef during the holiday season at both San Francisco and Los Angeles. Note that there was apparently but little slaughter during the week which ended December 31, compared with either the previous week or that which ended December 17 or December 10.

(Data and original maps furnished by the Western Cattle Marketing Association.)

ORIGIN OF CATTLE SLAUGHTERED AT SAN FRANCISCO AND LOS ANGELES DURING THE WEEKS ENDING DECEMBER 10, 17, 24, AND 31, 1927.



From May until August (fig. 16) both markets relied largely on the supplies of cattle originating within the state, with occasional shipments from Arizona. During these four months, the San Joaquin and Sacramento valleys, the middle coast section, and Imperial Valley made contributions to the supplies. The north coast section showed considerable activity during August and September.

Per-Capita Consumption of Beef and Veal, United States, 1900–1927

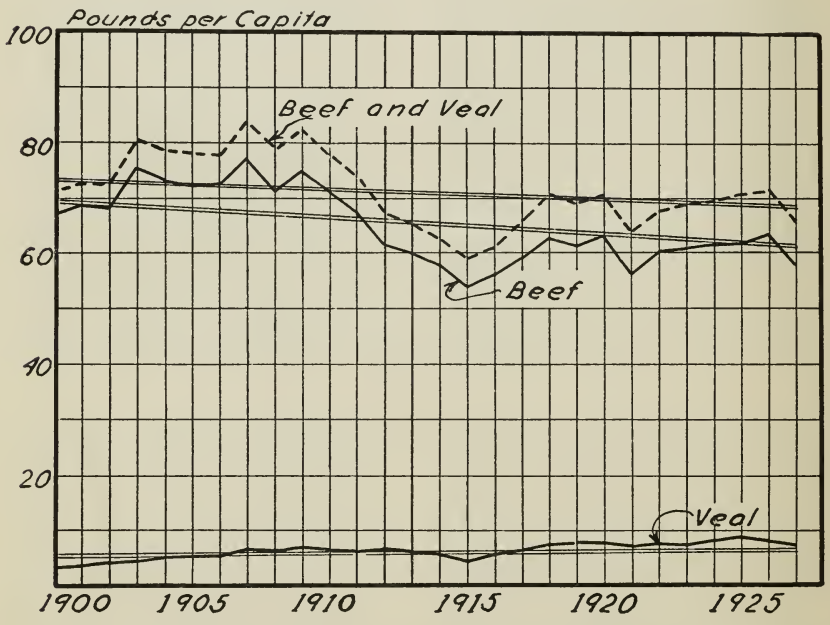


Fig. 19.—Beef has declined in per-capita consumption since 1900, while veal has increased. The percentage decline (trend values) for beef plus veal has been 8.58 per cent and for beef 11.67 per cent, while the per-capita consumption of veal has increased 36.84 per cent.

(Data from table 27.)

Toward the latter part of September supplies gradually were drawn from wider areas and during the last four months of the year Utah, Arizona, Idaho, Nevada, and at times southern Oregon, Wyoming, Texas, and New Mexico shipped supplies to the two markets studied (fig. 17). Within the state, supplies originated in widely separated areas, although it is interesting to note that the north central and northeastern counties contributed considerably to the movement.

One interesting and important phase of the results is somewhat clearly brought out by studying the maps for the weeks ending December 10, 17, 24, and 31, 1927 (fig. 18). Unofficial and rather widespread beliefs have prevailed to the effect that there is need for considerable shipments of beef at the Christmas holiday season. From a study of the figures it is evident that shipments both during the week before and after Christmas declined. (It may be that beef destined for the Christmas trade arrived during the first part of December). A check on the actual data also showed this to be true. At this season the supplies of beef required are light owing to the shipments of poultry to the large markets.

CONSUMPTION OF BEEF IN THE UNITED STATES AND FOREIGN COUNTRIES

United States.—Data on the annual consumption of meats are available since 1900 (table 27). Contrary to the popular belief, there has been but little change in the total per-capita consumption of all meats during the past twenty-seven years. Information on meat consumption for various strata of American society might show distinct trends, were the necessary data available. There has been a distinct decline in the per-capita consumption of beef since the beginning of the century, although conclusions drawn from a comparison of isolated years or even from a series of years are oftentimes erroneous unless the corresponding phase of the production cycle is considered. From 1900 to 1907 there was an upward tendency in the apparent consumption of beef, during which period the cattle cycle was in the expansion phase. This was followed by a distinct downward trend in consumption (fig. 19), which was accompanied by a downward movement in the cattle cycle. From 1915 to 1918 there was an actual increase in consumption, at which time the cattle cycle was in its expansion phase. The expansion was also reflected in the large exports. The three years 1918, 1919, and 1920 showed but little change in consumption. After a drop in 1921 the per-capita consumption began to move upward and this movement continued until 1926. Since 1922 cattle production has tended downward; the increased consumption being the result of heavy slaughter which in turn was caused by low prices. The total slaughter of cattle and salves since 1922 has exceeded the number of calves born. This heavy slaughter did not affect market supplies noticeably until the middle of 1927. The increased price during the last four months of the year tended to cause a downward

movement in consumption during 1927. Indications point to a greatly decreased per-capita consumption of beef in 1928. The authors estimate that the lowest point since 1900 will be reached. Unlike beef consumption, that of veal has been tending distinctly upward since 1900.

Since 1900, beef, mutton, and lamb have apparently been occupying places of lesser importance in the meat diet of the American people, while pork and veal have been increasing in importance. In 1927, beef and veal accounted for 46.9 per cent of the total consumption of meat, followed by pork with 49.2 and mutton and lamb with 4.0 per cent.

TABLE 27

ANNUAL PER-CAPITA CONSUMPTION OF MEAT AND LARD IN THE UNITED STATES, 1900–1927

Year	Beef	Veal	Lamb and mutton	Pork, not including lard	Total meat*	Lard	Total meats and lard
	pounds	*pounds*	*pounds*	*pounds*	*pounds*	*pounds*	*pounds*
1900	67.8	3.5	6.8	64.7	142.8	13.2	156.0
1901	69.0	3.9	6.9	63.0	142.8	12.9	155.7
1902	68.5	4.4	7.0	57.8	137.7	11.7	149.4
1903	76.0	4.7	7.2	59.3	147.2	11.8	159.0
1904	73.6	5.1	6.8	62.8	148.3	12.4	160.7
1905	73.0	5.4	6.5	58.8	143.7	10.0	153.7
1906	72.6	5.4	6.5	59.7	144.2	11.2	155.4
1907	77.5	6.7	6.4	64.4	155.1	13.5	168.6
1908	71.5	6.4	6.3	66.1	150.3	13.5	163.5
1909	75.4	6.9	6.6	60.1	149.8	11.5	161.3
1910	71.1	6.8	6.4	57.1	142.2	11.4	153.6
1911	67.7	6.4	7.8	64.5	147.1	11.3	158.4
1912	61.1	6.3	8.1	61.8	138.1	11.2	149.3
1913	60.6	5.1	7.5	63.0	136.2	11.4	147.6
1914	58.4	4.6	7.4	62.3	132.7	12.2	144.9
1915	54.5	4.3	6.3	59.5	124.8	12.9	137.7
1916	56.0	5.3	6.1	60.1	127.7	13.6	141.3
1917	59.5	6.5	4.6	49.3	120.1	11.7	131.8
1918	63.0	7.4	4.7	54.8	130.1	13.3	143.4
1919	61.6	7.7	5.8	54.8	130.0	12.3	142.3
1920	63.1	7.6	5.5	60.5	136.8	13.3	150.1
1921	56.9	7.0	5.9	63.5	133.3	11.3	144.6
1922	60.4	7.3	5.0	66.1	138.8	14.2	153.0
1923	61.3	7.7	5.2	74.7	149.0	15.3	164.3
1924	61.5	8.2	5.2	74.7	149.6	15.4	165.0
1925	62.1	8.7	5.2	67.6	143.6	13.2	156.8
1926	63.4	8.2	5.5	65.7	142.8	13.5	156.3
1927	58.0	7.4	5.4	68.5	139.3	13.8	153.1

* Includes a relatively very small quantity of goat meat which is not given separately.

Source of data: Roberts, John. Meat production, consumption, and foreign trade in the United States, calendar years 1900–1927. U. S. Dept. Agr. Bur. Animal Industry mimeographed circular. 9. p. 1928.

Regional consumption of Beef and Veal.—Estimates (table 28) indicate that the per-capita consumption of beef and veal is greater in urban than in rural areas. Rural areas, on the other hand, have a larger consumption of pork and poultry. The variation in beef and veal consumption is less in the urban areas of the country.

TABLE 28

Estimated Per-Capita Meat Consumption by Regions, 1919
(Pounds per capita.)

	Total	Beef	Veal	Mutton	Pork
URBAN					
North Atlantic	129.9	64.0	13.5	10.9	61.5
North central, east	154.0	75.6	11.6	7.3	69.3
North central, west	163.2	77.5	11.7	6.9	67.2
South Atlantic	142.4	55.1	5.7	5.4	76.3
South central	158.9	66.1	4.4	8.7	79.7
Western	166.6	76.2	16.3	13.6	11.2
Average	155.8	68.3	11.8	9.3	66.3
RURAL					
North Atlantic	150.8	47.1	10.7	7.6	85.5
North central, east	171.1	48.3	7.2	5.8	109.9
North central, west	180.7	57.4	6.3	3.8	113.1
South Atlantic	153.7	28.5	3.2	4.4	117.6
South central	158.5	28.6	1.7	6.9	121.3
Western	171.3	64.7	9.3	15.8	81.5
Average	163.2	41.6	5.4	6.5	109.7
TOTAL POPULATION					
North Atlantic	150.1	59.6	12.8	10.0	67.7
North central, east	167.3	62.7	9.5	6.6	88.5
North central, west	174.9	64.1	8.1	4.8	97.8
South Atlantic	150.9	35.2	3.8	4.7	107.1
South central	158.6	36.3	2.3	7.3	112.8
Western	169.0	70.3	12.7	14.7	71.3
Average	159.7	54.0	8.4	7.8	89.6

Source of data: U. S. Dept. Agr. Sectional meat consumption in the United States. U. S. Dept. Agr. Yearbook **1920**: 828. 1921.

The per-capita consumption of beef is larger in the western states than in any other section of the country, while it is low in the southern states (table 28). Veal consumption is subject to greater sectional variation than beef, the north Atlantic and the western states ranking high, with the southern states low. Estimates made by W. E. Schneider of the U. S. Department of Agriculture, Bureau of Agricultural Economics, confirm information with reference to the high consumption of beef and veal on the Pacific Coast (table 29).

Estimates indicate that approximately 55 per cent of the beef and veal are consumed in the states east of the Mississippi and north of the Ohio River and in the state of Maryland.[31] In these states live 52 per cent of the nation's population.

Not only do different sections vary in the amount of meat consumed but there are variations of considerably magnitude within each section.[32]

TABLE 29

Estimated Per-Capita Consumption of Meat on the Pacific Coast, 1926

Class	Pounds
Beef	72.1
Veal	8.7
Mutton and lamb	25.0
Pork	60.0
Lard	10.0
Total	175.8

Source of data: W. E. Schneider, U. S. Dept. Agr. Bur. Agr. Econ., San Francisco, Calif.

TABLE 30

Estimated Per-Capita Consumption of Beef and Veal in Certain Countries, Pre-War,* and Annual, 1921–1927
(Pounds)

Year	United States	Canada	Argentina	United Kingdom	Denmark	Belgium	France	Germany	Australia (New South Wales)	New Zealand
Pre-war	74.0	60.9	254.9	61.3	44.5	41.6	49.2	40.6	152.3	
1921	63.9	71.0	195.0	57.2	.....	33.8	46.4	30.7	94.0	
1922	67.7	72.9	293.3	62.9	57.7	41.8	47.4	31.9	112.6	
1923	69.1	70.6	320.8	63.8	.....	46.6	47.0	23.7	123.0	147.1**
1924	69.7	70.2	300.7	63.4	.....	49.9	49.3	34.3	126.1	
1925	70.8	70.2	264.7	66.2	.....	45.2	49.7	39.1	125.3	
1926	71.6	70.1	245.7	65.5	.....	45.2	48.9	39.7	.....	
1927	65.4	68.8	260.7	64.0	.....	.....	45.9	40.2	.....	.....

* Average for five years 1909–1913 wherever available.

** Average for ten-year period ending with 1926.

Source of data: U. S. Dept. Agr., Bur. Agr. Econ. Estimated per-capita consumption of beef, mutton and pork in specified countries. Foreign Crops and Markets **17** (6): 218–220. 1928.

[31] McFall, Robert James. The world's meat. 624 p., 35 diag. D. Appleton and Co., New York, 1925.

[32] Gardner, Kelsey B., and Lawrence A. Adams. Consumer habits and preferences in the purchase and consumption of meat. U. S. Dept. Agr. Dept. Bul. **1443**: 1–64. 1926.

The distribution of beef consumption as calculated by the United States Department of Agriculture is in general confirmed by data used by the United States Department of Labor in calculating the cost of living in different sections.[33]

Consumption in Other Countries.—Contrary to the generally prevalent opinion, beef and veal per-capita consumption gradually increased in several of the more important beef-consuming countries from 1921 to 1926, with the exception of France, in which it appears to have decreased slightly in 1926. Data on consumption in Great Britain and Canada indicate that in both countries the per-capita consumption is higher than during the pre-war years. The Bureau of Agricultural Economics of the United States Department of Agriculture reports that there has been an increase in beef and pork per-capita consumption in most countries during the past few years at the expense of mutton and lamb. The per-capita consumption of beef and veal is greater in Argentina, Australia, New Zealand, and the United States than in other countries. It is to be noted that with the possible exception of the latter all are surplus cattle areas and comparatively young countries.

PRICES AND PURCHASING POWER OF BEEF CATTLE

Annual Inventory Values of the United States Department of Agriculture.—Since 1867 yearly estimates on the valuation of livestock have been made on January first by the United States Department of Agriculture. While studies with reference to the trends and cycles in cattle values should be helpful to the cattleman in preparing for future operations, such statistical information as may be obtained does not enable one to see the future in an absolute manner. The data relative to cycles of cattle values simply indicate what has happened in the past. In these inventory studies January first values have been expressed in terms of purchasing power (table 31).

Warren and Pearson[34] show that the peaks in the January first valuations (expressed in purchasing power) of cattle other than dairy cows in the United States have occurred in 1885, 1899, and 1915, while the low points have been 1891, 1906, and 1925. These data have been checked by the authors (table 31). The cycles of purchasing power have been fairly regular, the peaks being fourteen to sixteen years apart. The variation in the length of time between the low points

[34] Warren, G. F., and F. A. Pearson. Purchasing power of beef cattle, 1880–1927. New York State College Agr., Farm Economics 2(44): 659. 1927.

and high points has been from six to ten years. These high points have not been maintained for long periods of time (fig. 20). The cycle is not mere magic, the explanation lying partially in the fact that good profits often result in over-production, while low prices result in under-production. At the present time appearances point to an upward trend in the cycle.

PURCHASING POWER OF CATTLE OTHER THAN MILK COWS, UNITED STATES AND CALIFORNIA, JANUARY 1, 1869–1928

(Purchasing power is measured in terms of the average purchasing power of the dollar in 1910–1914.)

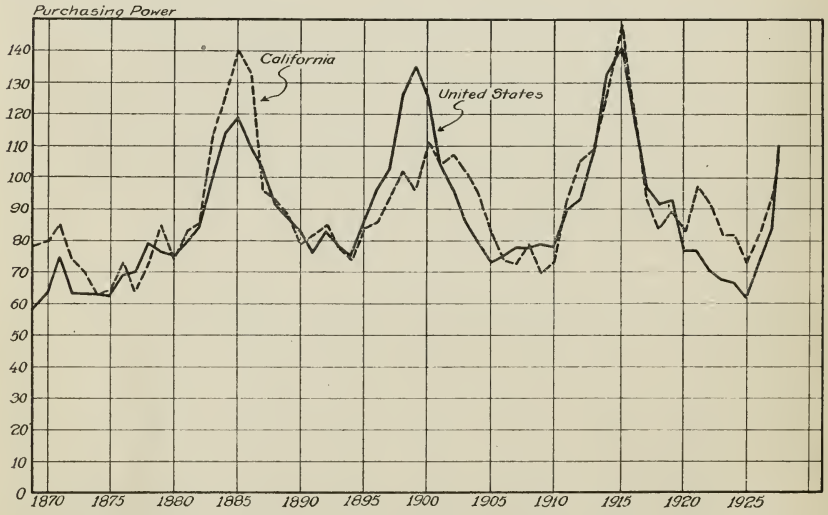


Fig. 20.—The purchasing power of cattle other than milk cows on January 1 of each year in the United States and in California shows a rather definite cyclical movement. While the peaks and depressions of the cycles for the nation and state do not absolutely correspond, there is a high degree of correlation between the two. The cycles are characterized by a rather short period of high values and a comparatively long period of low values. On January 1, 1928, inventory values were on the rise. If the future can be interpreted from the past, values should be comparatively high for the next two or three years. On account of improvements in cattle breeding, feeding, and management, it is somewhat dangerous to make definite predictions. In the past, high inventory values have been reached in the United States in 1884, 1899, and 1915. Low values are somewhat more obscure but have occurred in 1891, 1905, and 1925.

(Data from table 31)

[33] U. S. Dept. Labor. Retail prices, 1890–1925. U. S. Dept. Labor, Bur. Labor Statis., Bul. 418: 4. 1926.

TABLE 31

ACTUAL AND RELATIVE VALUES, AND RELATIVE PURCHASING POWER OF CATTLE OTHER THAN DAIRY CATTLE, UNITED STATES AND CALIFORNIA, JANUARY 1, 1867–1928

Year	All-commodity index Jan. of year in col. 1	United States			California		
		Actual value (Dollars per head)	Relative value	Relative Purchasing power	Actual value (Dollars per head)	Relative value	Relative Purchasing power
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
1867	151	15.79	66.74	44.2			
1868	141	15.06	63.65	45.1			
1869	135	18.73	79.16	58.6	27.86	105.13	77.9
1870	125	18.67	78.91	63.1	26.22	98.94	79.2
1871	119	20.78	87.83	73.8	26.92	101.58	85.4
1872	122	18.12	76.58	62.8	23.80	89.81	73.6
1873	121	18.06	76.33	63.1	22.71	85.70	70.8
1874	117	17.55	74.18	63.4	19.52	73.66	63.0
1875	112	16.91	71.47	63.8	18.92	71.40	63.8
1876	104	17.00	71.85	69.1	20.08	75.77	72.9
1877	97	15.99	67.58	69.7	16.52	62.34	64.3
1878	89	16.72	70.67	79.4	17.23	65.02	73.1
1879	85	15.38	65.00	76.5	18.91	71.36	84.0
1880	94	16.57	70.03	74.5	18.47	69.70	74.1
1881	93	17.33	73.25	78.8	20.35	76.79	82.6
1882	95	18.89	79.84	84.0	21.77	80.26	84.5
1883	93	21.81	92.18	99.1	27.48	103.70	111.5
1884	87	23.52	99.41	114.3	29.15	110.00	126.4
1885	82	23.25	98.27	119.8	30.38	114.64	139.8
1886	81	21.17	89.48	110.5	28.66	108.15	133.5
1887	81	19.79	83.64	103.3	20.64	77.89	96.2
1888	83	17.79	75.19	90.6	20.50	77.36	93.2
1889	83	17.05	72.06	86.8	19.37	73.09	88.1
1890	80	15.63	66.06	82.6	16.80	63.40	79.1
1891	82	14.76	62.38	76.1	17.73	66.91	81.6
1892	77	15.16	64.07	83.2	17.39	65.62	85.2
1893	83	15.24	64.41	77.6	17.12	64.60	77.8
1894	83	14.66	61.96	74.7	16.17	61.02	73.5
1895	69	14.06	59.43	86.1	15.28	57.66	83.6
1896	70	15.86	67.03	95.8	15.82	59.70	85.3
1897	68	16.65	70.37	103.5	16.93	63.89	94 0
1898	70	20.92	88.42	126.3	18.91	71.36	101.9
1899	71	22.79	96.32	135.7	18.01	67.96	95.7
1900	83	24.73	104.52	125.9	24 57	92.72	111.7
1901	81	19.93	84.23	104.0	22.25	83.96	103.7
1902	83	18.76	79.29	95.5	23.48	88.60	106.7
1903	91	18.45	77.98	85.7	24 51	92.49	101.6
1904	87	16.32	68.98	79.3	21.98	82.94	95.3
1905	88	15.15	64.03	72.8	19.29	72.79	82.7
1906	89	15.85	66.99	75.3	17.52	66.11	74.3
1907	93	17.10	72.27	77.7	18.00	67.92	73.0
1908	91	16.89	71.39	78.5	19.00	71.70	78.8
1909	94	17.49	73.92	78.6	17.50	66.04	70.3
1910	104	19.07	80.60	77.5	20.10	75.85	72.9
1911	96	20.54	86.81	90.4	23.50	88.68	92 4
1912	96	21.20	89.60	93.3	26.70	100.75	104.9
1913	102	26.36	114.41	112.2	29.20	110.19	108.0
1914	100	31.13	131.57	131.6	33.00	124.53	124.5
1915	100	33.38	141.08	141.1	39.30	148.30	148.3
1916	115	33.53	141.72	123.2	36.30	136.98	119.1

TABLE 31—(*Continued*)

Year	All-commodity index Jan. of year in col. 1	United States			California		
		Actual value (Dollars per head)	Relative value	Relative Purchasing power	Actual value (Dollars per head)	Relative value	Relative Purchasing power
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
1917	156	35.88	151.65	97.2	38.30	144.53	92.6
1918	188	40.88	172.78	91.9	42.10	158.87	84.5
1919	202	44.22	186.90	92.5	48.20	181.89	90.0
1920	237	43.21	182.63	77.1	51.90	195.85	82.6
1921	173	31.36	132.54	76.6	44.50	167.92	97.1
1922	141	23.80	100.59	71.3	34.30	129.43	91.8
1923	159	25.67	108.50	68.2	34.40	129.81	81.6
1924	154	24.44	103.30	67.1	33.35	125.85	81.7
1925	163	23.94	101.18	62.1	30.55	115.28	70.7
1926	159	27.43	115.93	72.9	35.16	132.68	83.4
1927	150	29.87	126.25	84.2	37.00	139.62	93.1
1928	149	38.95	164.62	110.5	42.08	158.79	106.6

Sources of data:

Col. 2. Bureau of Labor Statistics, All-Commodity Index for January of each year. Base 1910–1914 =100.

Col. 3, 1867–1923, U. S. Dept. Agr. Cattle: farm price per head. U. S. Dept. Agr. Yearbook **1922**: 820. 1923. 1924–25, Kaufman, E. E. California crop report 1926. California State Dept. Agr., Spec. Pub. **74**: 45. 1927. 1926–28, Kaufman, E. E. Summary of California annual livestock report—1928. U. S. Dept. Agr. and California State Dept. Agr. mimeographed report issued Feb. 3, 1928.

Col. 4. Relatives of data in col. 3. 1910–1914=$23.66=100.

Col. 5. Col. 4 divided by Col. 2.

Col. 6. 1869–1925. U. S. Dept. Agr. Bur. Agr. Econ. Prices of farm products received by producers 4; Mountain and Pacific states. U. S. Dept. Agr. Statistical Bul. **17**: 149. 1927. 1926–1928, Kaufman, E. E. Summary of California annual livestock report—1928. U. S. Dept. Agr. and California State Dept. Agr. mimeographed report issued Feb. 3, 1928.

Col. 7. Relatives of data in Col. 6. 1910–1914=$26.50=100.

Col. 8. Col. 7 divided by Col. 2.

While it is true that the cycles in beef-cattle valuations have been fairly regular, improved methods and more widespread knowledge of actual conditions may logically shorten the periods which have been prevalent in the past.

Data for California valuations check those for the United States closely. High points in the value of cattle other than dairy cattle were reached in 1885, 1900, and 1916, while low points were found in 1877, 1894, 1909, and 1925. The slight differences between the data for the nation and the state occur mainly in connection with the low points. It should be noted that the troughs are comparatively broad, the selection of a specific year being more a matter of personal opinion than exact scientific measurement. If history is repeated the trend may be upward for the next three or four years. This means that if the general price level falls beef cattle will fall less rapidly in price or the price may even rise, and if the general price level rises beef cattle prices will probably rise more rapidly.

Farm Prices and Purchasing Power of Beef Cattle, United States and California, 1910–1927

(Purchasing power is measured in terms of the average purchasing power of the dollar in 1910–1914.)

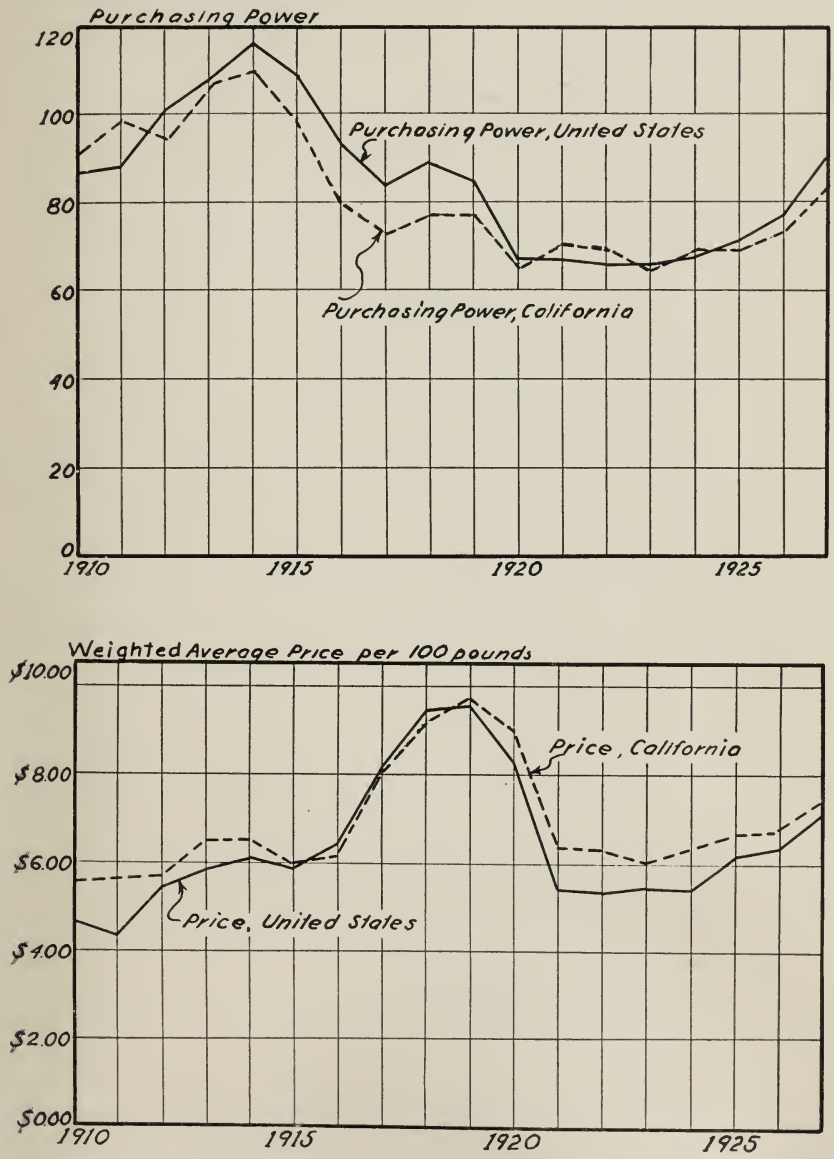


Fig. 21.—High prices do not necessarily mean high purchasing power. During the period 1915–1919, prices were rising and purchasing power was actually falling. Since 1923 both prices and purchasing power have been rising. In all probability purchasing power for the next two or three years will be comparatively high.

(Data from table 34.)

The prevention of cycles in the cattle industry has been a subject of interest among cattlemen. The authors believe that if cattlemen would realize that one of the important factors is the contraction and expansion of herds they might partially prevent these periods of depression and prosperity. According to the data available the cycles are particularly severe in the cattle industry. In comparing cattle-value cycles with those of other classes of livestock, it will be found that the longer it takes to change the number of animals, the more violently prices swing out of adjustment. While it is improbable that minor fluctuations can be removed, the major swings, with more accurate data available in the future, may be smoothed somewhat.

TABLE 32

Estimated Price Received by Producers for Beef Cattle in the United States, 1910–1928

(Per 100 pounds live weight.)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Weighted average*
1910	4.54	4.54	4.87	5.31	5.23	5.04	4.84	4.64	4.65	4.64	4.48	4.45	4.76
1911	4.58	4.57	4.66	4.67	4.59	4.43	4.28	4.39	4.43	4.32	4.36	4.37	4.46
1912	4.46	4.61	4.75	5.15	5.36	5.23	5.44	5.38	5.35	5.36	7.05	6.89	5.49
1913	5.40	5.55	5.88	6.08	6.01	6.02	5.98	5.91	5.92	6.05	5.99	5.96	5.91
1914	6.04	6.16	6.28	6.29	6.33	6.32	6.38	6.47	6.38	6.23	6.02	6.01	6.24
1915	5.99	5.93	5.92	5.96	6.13	6.20	6.07	6.18	6.06	6.04	5.85	5.75	6.01
1916	5.85	5.99	6.37	6.66	6.73	6.91	6.78	6.51	6.55	6.37	6.44	6.56	6.48
1917	6.85	7.36	7.91	8.57	8.70	8.65	8.30	8.17	8.40	8.35	8.21	8.24	8.17
1918	8.33	8.55	8.85	9.73	10.38	10.40	10.07	9.71	9.63	9.33	9.14	9.28	9.47
1919	9.65	10.02	10.34	10.81	10.84	10.20	9.96	9.82	9.02	8.65	8.65	8.63	9.63
1920	8.99	8.98	9.08	9.20	8.97	9.32	8.93	8.56	8.29	7.77	7.15	6.36	8.39
1921	6.32	6.02	6.36	6.08	5.98	5.65	5.40	5.39	4.98	4.81	4.69	4.62	5.45
1922	4.75	5.07	5.46	5.53	5.70	5.84	5.76	5.51	5.44	5.48	5.29	5.28	5.43
1923	5.51	5.55	5.62	5.78	5.77	5.82	5.72	5.60	5.70	5.48	5.23	5.26	5.57
1924	5.38	5.47	5.63	5.82	5.94	5.79	5.65	5.67	5.53	5.52	5.43	5.35	5.59
1925	5.63	5.69	6.18	6.55	6.48	6.46	6.55	6.58	6.27	6.29	6.14	6.18	6.26
1926	6.31	6.42	6.65	6.66	6.57	6.56	6.46	6.29	6.48	6.43	6.32	6.42	6.45
1927	6.45	6.60	6.82	7.13	7.17	7.08	7.13	7.21	7.42	7.55	8.00	8.32	7.29
1928	8.48	8.72	8.81	8.92	9.09	9.10	9.19	9.51	9.96	9.63	.....	.....	.....

* Weighted average computed by authors with following weights—Jan. 8, Feb. 6, Mar. 7, Apr. 7, May 8, June 8, July 8, Aug. 9, Sept. 10, Oct. 10, Nov. 11, Dec. 8.

Sources of data: 1910–1926. U. S. Dept. Agr. Cattle, Beef: estimated price per 100 pounds, U. S. Dept. Agr. Yearbook: **1926**: 1046. 1927. 1927–1928. Monthly issues U. S. Dept. Agr. Crops and Markets.

Farm Prices of Beef Cattle in the United States and California. —The value per head of beef cattle varies with condition, quality, age, size, and weight, and is consequently highly variable even in a single state.[35] The price would apply in some localities to well-

[35] Sarle, Charles F. Reliability and adequacy of farm price data. U. S. Dept. Agr. Dept. Bul. 1480: 1–65. 1927.

finished cattle, while in some dairy regions the cattle sold for beef are mostly worn-out dairy cattle. The data in table 34 and figure 21 should be used only in a general way as they are perhaps only a rough approximation of the actual situation. Generally speaking, prices have been at higher levels in California than in the nation. Since the low point during the winter of 1921–1922 prices in both the nation and state have tended upward.

TABLE 33

Estimated Price Received by Producers for Beef Cattle in California, 1910–1928

(Per 100 pounds live weight.)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Weighted average*
1910	5.30	5.30	5.80	5.70	5.20	6.00	6.00	5.00	6.00	6.00	5.00	6.00	5.63
1911	6.20	5.80	5.90	6.10	6.50	5.40	5.20	4.90	6.50	5.20	5.20	5.20	5.65
1912	5.20	5.40	6.00	6.40	5.70	5.50	5.50	5.90	5.50	5.60	5.70	6.30	5.72
1913	6.30	6.50	6.70	6.50	6.60	6.60	6.30	6.70	6.40	6.50	6.80	6.50	6.53
1914	6.70	6.90	6.80	6.80	6.60	6.60	6.50	6.40	6.60	6.50	6.40	6.60	6.60
1915	6.40	6.40	6.30	6.40	6.00	6.00	6.10	6.10	5.90	5.80	5.90	6.00	6.09
1916	6.00	6.10	6.30	6.80	6.40	6.40	6.40	6.20	6.10	6.00	6.10	6.70	6.23
1917	7.20	7.50	8.10	8.50	8.40	7.90	8.30	7.70	8.30	8.00	8.20	7.90	8.02
1918	8.30	8.80	9.30	9.80	10.10	9.50	9.40	9.20	9.00	9.10	9.10	9.50	9.29
1919	10.00	10.90	10.90	10.80	11.05	9.70	9.70	9.30	9.00	9.00	8.90	9.40	9.85
1920	10.10	10.70	10.45	10.20	9.90	8.70	8.80	8.80	8.30	8.30	8.30	8.30	9.16
1921	8.30	8.10	7.50	7.20	6.70	6.50	6.00	5.90	5.50	5.50	5.50	5.50	6.43
1922	5.80	6.20	6.70	6.90	7.00	6.50	6.20	6.20	6.20	6.20	6.30	6.40	6.39
1923	7.10	6.60	6.40	6.30	6.10	6.00	5.70	6.00	5.90	6.10	6.10	6.10	6.16
9124	6.60	7.00	7.50	7.10	6.90	6.50	6.20	6.00	6.00	5.90	5.80	6.40	6.46
1925	6.30	6.80	6.70	7.20	7.10	7.50	6.90	6.50	6.70	6.50	6.60	6.80	6.82
1926	7.40	7.30	7.30	7.30	7.20	6.50	6.50	6.60	6.70	6.90	6.70	7.00	6.91
1927	7.20	7.50	7.40	7.50	7.30	7.20	6.90	7.30	7.30	7.70	7.60	8.70	7.53
1928	9.80	9.50	9.80	9.50	9.20	9.10	9.00	9.30	10.30	10.20	.....	.....	.....

* Weighted average computed by authors with the following weights—Jan. 7, Feb. 6, Mar. 7, Apr. 8, May 9, June 10, July 11, Aug. 10, Sept. 9, Oct. 8, Nov. 7, Dec. 8.

Sources of data: 1910–1925, U. S. Dept. Agr. Bur. Agr. Econ. Prices of farm products received by producers; 4, Mountain and Pacific states. U. S. Dept. Agr. Stat. Bul. 17: 144. 1927. 1926–1928, U. S. Dept. Agr., Crops and Markets.

It is extremely difficult to gauge accurately the purchasing power of beef cattle in terms of all commodities. The base period (1910–1914) which is used in the rough approximation made in this publication was a period of rising prices for beef cattle in both the state and nation, but this was not the case with all commodities. Furthermore, the prices received during the base period 1910–1914 were high in California compared with those of the nation, which makes the present purchasing power appear low for this state. With this and other inaccuracies in mind, a comparison has been made between beef

prices and those for commodities in general. Although general wholesale prices rose rapidly during the war period, beginning in 1916 beef prices began to lag. This was especially noticeable in California where the general level of beef prices was relatively low.

TABLE 34

Relative Prices (Received by Producers) and Relative Purchasing Power of Beef Cattle, United States and California, 1910–1928

Year	All-commodity index	United States		California	
		Relative price	Relative purchasing power	Relative price	Relative purchasing power
1	*2*	*3*	*4*	*5*	*6*
1910	102.7	88.6	86.3	93.4	91.0
1911	94.7	83.1	87.8	93.8	99.0
1912	100.9	102.2	101.3	94.9	94.1
1913	101.8	110.1	108.2	108.4	106.5
1914	99.9	116.2	116.3	109.5	109.6
1915	102.6	111.9	109.1	101.1	98.5
1916	129.0	120.7	93.6	103.4	80.1
1917	180.3	152.1	84.4	133.1	73.8
1918	197.7	176.4	89.2	154.2	78.0
1919	210.1	179.3	85.3	163.5	77.8
1920	230.2	156.2	67.9	152.0	66.0
1921	149.6	101.5	67.8	106.7	71.3
1922	151.5	101.1	66.7	106.0	70.0
1923	156.5	103.7	66.3	102.2	65.3
1924	152.4	104.1	68.3	107.2	70.3
1925	162.0	116.6	72.0	113.2	69.9
1926	154.0	120.1	78.0	114.7	74.5
1927	149.0	135.8	91.1	125.0	83.9
1928—January	149.0	157.9	106.0	162.6	109.1
February	149.0	162.3	108.9	157.7	105.8
March	149.0	164.0	110.1	162.6	109.1
April	151.0	166.0	109.9	157.7	104.4
May	153.0	169.2	110.6	152.7	99.8
June	151.0	169.4	112.2	151.0	100.0
July	152.0	171.1	122.6	149.4	98.3
August	153.0	177.0	115.7	154.3	100.8
September	155.0	185.4	119.6	170.9	110.3

Sources of data:

Col. 2, Bur. Labor Statistics, All-commodity index, 1910–14=100.
Col. 3, table 32, 1910–14=100.
Col. 4, col. 3 divided by col. 2.
Col. 5, table 33. 1910–14=100.
Col. 6, col. 5 divided by col. 2.

Since the depression year of 1920 there has been a fairly close general agreement between the purchasing power of beef cattle in the United States and in this state. Compared with prices of commodities in general there has been a decided improvement in beef-cattle prices, especially during the latter part of 1927. The

purchasing power during 1927, however, did not give an indication of being high. Compared with commodities in general it would appear that the price was roughly normal during the latter part of the year. The first ten months of 1928 give indications that the purchasing power for the year will be over 100 per cent. With the comparatively lean years which the industry has experienced since 1920, many stockmen have undoubtedly pruned expenses severely. Prices appear to them to have been high in 1927, and herein lies a danger that cattlemen may increase their herds too rapidly. While indications point to a comparatively favorable situation during the next few years, cattlemen have it within their power to prolong the situation provided new additions to herds are made slowly.

A study of the average wholesale prices received for beef cattle at Chicago since 1910 evidences the same general trend as farm prices. Until 1917 the agreement between the two series of general farm prices in the United States and Chicago prices was striking. Since the latter date the farm series has been relatively lower although during the past two years there has been a tendency for a closer agreement. Throughout this discussion unit prices are used. These together with purchasing power do not give a true picture of the industry, because volume of production is left out of account.

Owing to the wide range of prices for the lower grades, an average means little or nothing. It is of interest to note that a series of data showing the average prices of cutters and canners on the Chicago market since 1910 indicates that the prices for this type of stuff have been relatively lower since 1918 than for any of the higher grades of animals.

Quotations of the Bureau of Agricultural Economics.—The Bureau of Agricultural Economics of the United States Department of Agriculture publishes daily quotations on the various grades of livestock and upon the weights within these grades. A range of price is quoted, and in calculations in this bulletin the arithmetic mean of the high and low quotations of the range is used unless a notation is made to the contrary. This type of work is open to the criticism that the cattle within the grade may change in quality from day to day, from month to month, and from season to season. Since there is difficulty in quoting upon a uniform product, calculations should be viewed as a general approximation of what really happens. Several grades are quoted on each of the larger markets.[36] On the Pacific Coast the quotations for the higher grades and larger steers are usually lacking.

[36] Gibbons, C. E. Market classes and grades of livestock. U. S. Dept. Agr. Bul. 1360: 1–47. 1926.

WHOLESALE QUOTATIONS OF "MEDIUM STEERS, 1100 POUNDS DOWN," AT CHICAGO, LOS ANGELES, AND SAN FRANCISCO, 1922–1928

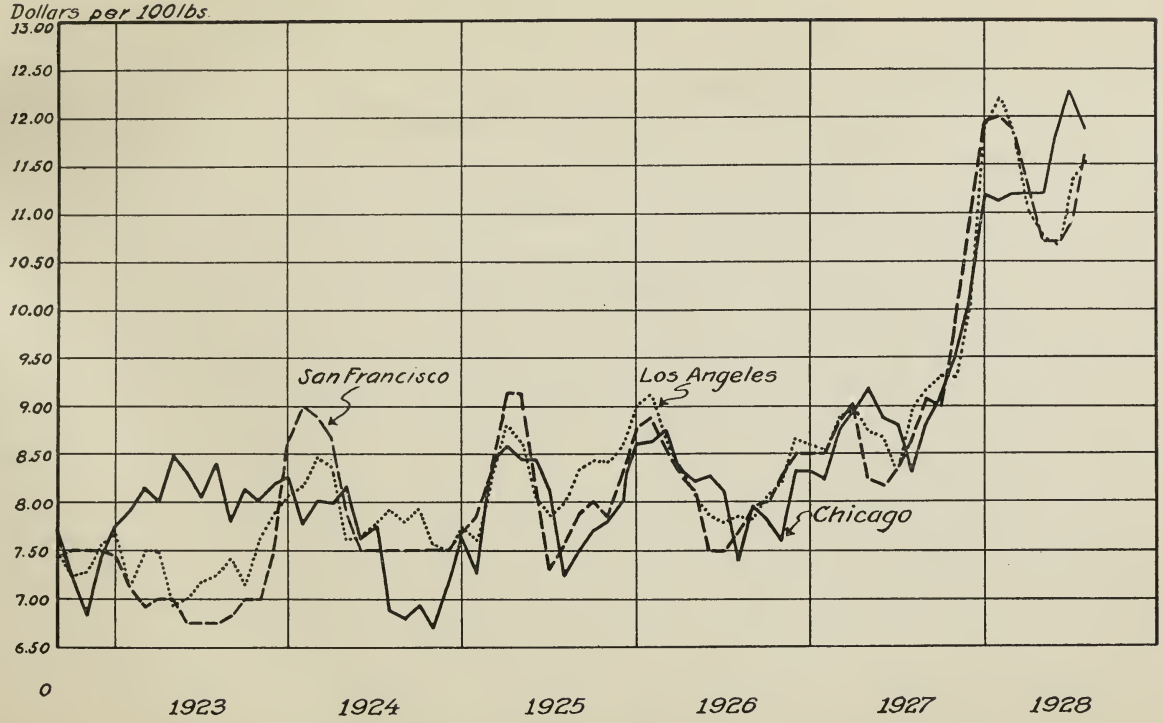


Fig. 22.—An exact comparison between wholesale quotations in Chicago on one hand and San Francisco and Los Angeles on the other is extremely difficult to make on account of the variation within the grade of the animals upon which quotations are made. In the above diagram the high of the range at San Francisco and Los Angeles and the low of the range at Chicago are used. During the past two years there apparently has been a closer correlation between prices in the Middle West and California.

(Data complied by authors from the daily market reports of the Bur. Agr. Econ.)

Since the latter part of 1922 the quotation on "medium steers 1100 pounds down" has been most consistently published, although slight changes in this classification have been made. San Francisco and Los Angeles prices have steadily increased since 1922, the most pronounced improvement coming about in 1927 (fig. 22).

Comparisons between prices on the San Francisco and the Los Angeles markets with those on the Chicago market are difficult to make. It is probable that the Chicago price is for a higher grade of animal. The spread between the high and low price at Chicago is such that it is doubtful whether the mean of these extremes can be used in any other way than to indicate very general trends. There is a greater correlation between the "low" of the Chicago quotation and the "high" of the San Francisco and Los Angeles than between the average price quotations in the two localities (fig. 22).

Cattle and the dressed products as well are bought at Chicago and other large midwestern and eastern markets more nearly on the basis of grade than is the case on the Pacific Coast, particularly until very recently. The Bureau of Agricultural Economics through Mr. C. V. Whalin, its representative, states, "There are two important factors that operate to cause a relatively narrow spread between the low and high ends of the price quotations on medium grade steers on Pacific Coast markets as compared with Chicago. These are (1) a much wider spread in the market value of beef by grade and by class in eastern territory than on the Pacific Coast—a spread that is logically reflected by hoof prices, and (2) a greater disposition on the part of the trade in the midwest and east to buy cattle more nearly on the judged merit of individual lots than is the case in the far west. In other words, there is less tendency to regard a steer as a steer, a cow as a cow, either on foot or in the carcass, at the more eastern market centers than in western areas."[37]

This fine distinction between values within grades plus varying preferences for one weight selection over another accounts for price spreads of as much as $3.00 or more per hundredweight between the minimum and maximum quotations on a given grade of beef steers on the Chicago market.

Comparison of Beef and Veal Prices.—Since 1920, the margin between prices for veal and beef have generally been far greater than before the war (fig. 23). The tendency for this margin to widen has played a part in the increasing number of calves which have been

[37] Letter from C. V. Whalin, in charge, Marketing Livestock, Meats, and Wool Division of the U. S. Dept. Agr. Bur. Agr. Econ., to Edwin C. Voorhies, January 26, 1928.

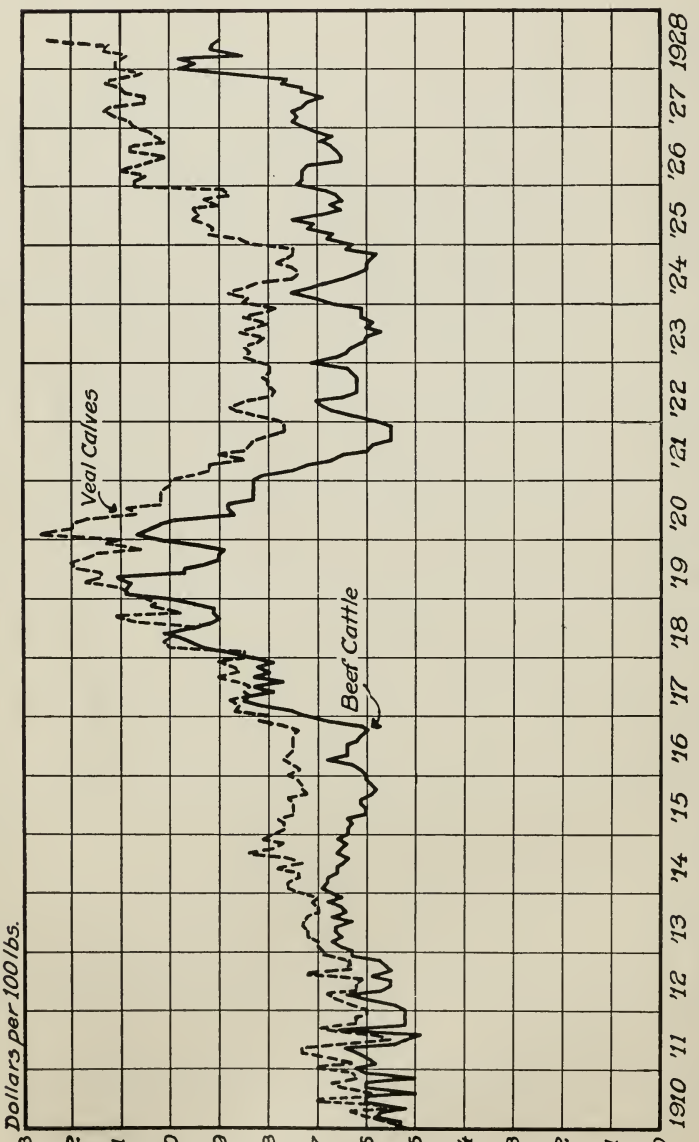


Fig. 23.—The spread between prices paid for beef cattle and veal calves has been greater since, than before and during the War. The veal-calf supply is proportionately large in California on account of the large number of dairy cattle in this state.

(Data from table 33 and from: Voorhies, E. C. Economic aspects of the dairy industry. California Agr. Exp. Sta. Bul. **437**: 113. 1927. Current data from U. S. Dept. Agr. Crops and Markets.)

marketed. Prices for veal calves in California have consistently shown a higher purchasing power than those for beef animals since 1919. There is no foundation for believing that the veal price will continue to draw away from the beef price. With an increase in dairying it is highly probable that there will be an increase in the number of veal calves marketed.

Seasonal Variation in Prices of "Beef Steers, 1100 Pounds Down, Medium Grade, at Chicago," San Francisco, and Los Angeles, 1922–1927

Average month = 100.

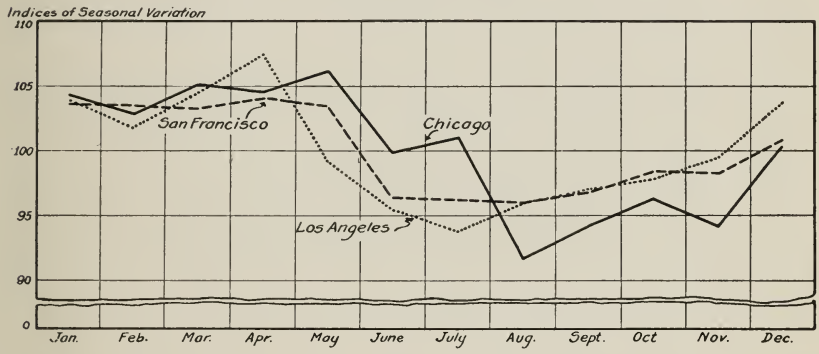


Fig. 24.—The data used are the low of the range of quotations. A high degree of correlation exists between the seasonal variation at San Francisco and Los Angeles. From this chart indications are that quotations at Chicago for medium steers are relatively higher from May to June, at which time there is often a small surplus on the California market. The period of time on which the data are based is far too short for the formulation of definite conclusions.

(Data from table 37.)

Seasonal Variation in Beef Cattle Prices.—Variations in quotation grades and the lack of a comparable series of prices over a sufficiently long period of time make it extremely difficult to analyze the seasonal variations in the wholesale prices of beef animals. The average (arithmetic mean) of the quotations for "medium steers 1100 pounds down," has been used for San Francisco and Los Angeles in table 37. Slight changes have been made in the classification by grade, but the data in tables 35 and 36 are such that they cover the same general classification throughout. While these data are available since 1922, quotations at times have not represented the range of quality within the class itself. This is particularly true during the summer season, at which time there are perhaps relatively more poor animals on the San Francisco and Los Angeles markets than at other times during the year.

TABLE 35

AVERAGE MONTHLY PRICES OF MEDIUM AND COMMON GRADE STEERS AT SAN FRANCISCO, 1922–1928

(Dollars per hundred pounds live weight.)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Medium												
1922	.....	.....	.....	.....	.....	.....	.....	.....	7.19	7.25	7.25	7.25
1923	7.20	6.88	6.69	6.75	6.75	6.50	6.50	6.50	6.50	6.75	6.75	7.18
1924	7.97	8.13	8.08	7.97	7.41	7.00	7.00	7.00	7.00	7.00	7.00	7.00
1925	7.19	7.38	7.74	8.63	8.64	8.08	7.14	7.04	7.38	7.50	7.41	7.61
1926	8.13	8.44	8.30	7.97	7.81	7.43	7.25	7.45	7.60	7.63	7.78	8.00
1927	8.00	8.00	8.28	8.50	8.00	7.84	7.97	8.10	8.59	8.63	9.21	9.97
1928	10.95	11.00	10.94	10.37	9.96	9.95	10.17	10.81	11.24	11.12	.....	.....
Common												
1922	.....	.....	.....	.....	.....	.....	.....	.....	6.35	6.38	6.38	6.34
1923	6.40	6.18	6.00	5.60	5.50	5.50	5.50	5.50	5.50	5.50	5.69	5.75
1924	6.22	6.13	6.13	6.13	6.00	6.00	5.75	5.75	5.75	5.75	5.50	5.55
1925	5.94	6.13	6.49	7.22	7.33	7.13	6.31	6.02	6.19	6.25	6.25	6.25
1926	6.50	6.75	6.75	6.56	6.50	6.33	6.25	6.35	6.50	6.63	6.65	6.75
1927	6.75	6.75	6.91	7.13	7.00	6.75	6.75	6.83	7.44	7.68	7.94	7.75
1928	8.55	9.00	9.00	8.77	8.58	8.58	8.79	9.31	9.74	9.69	.....	.....

NOTE.—Quotations are arithmetic averages of the Monday quotations published during each month. Quotations—Sept. 1922–Oct. 1923 on "Medium and Common Beef Steers;" Nov. 1923–June 1927 on "Medium and Common Beef Steers, 1,100 pounds down;" July 1927 on "Medium and Common Beef Steers, 800 pounds up."

Source of data: U. S. Dept. Agr. Bur. Agr. Econ. Daily livestock market summary. Mimeographed daily report, published by the San Francisco Office, Bur. Agr. Econ.

TABLE 36

AVERAGE MONTHLY PRICES OF MEDIUM AND COMMON GRADE STEERS AT LOS ANGELES, 1922–1928

(Dollars per hundred pounds live weight.)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Medium												
1922	.....	.....	.....	.....	.....	.....	.....	.....	7.25	7.25	7.28	7.22
1923	7.16	6.69	7.07	7.28	6.70	6.73	6.82	6.88	7.07	6.83	7.26	7.53
1924	7.66	7.71	7.94	7.88	7.09	6.92	7.11	6.85	7.31	7.43	7.10	6.98
1925	6.13	7.01	7.71	8.30	7.94	7.56	7.28	7.38	7.74	7.82	7.89	8.13
1926	8.60	8.63	8.15	7.95	7.60	7.39	7.31	7.43	7.39	7.63	7.73	8.17
1927	8.14	8.06	8.31	8.23	8.23	8.11	7.89	8.51	8.68	8.86	9.28	10.06
1928	11.25	11.58	11.25	10.51	10.27	10.25	10.78	11.46	11.68	11.65	.....	.....
Common												
1922	.....	.....	.....	.....	.....	.....	.....	.....	6.38	6.38	6.35	5.35
1923	5.95	5.69	5.94	6.25	5.86	5.97	6.07	6.13	6.22	6.00	6.19	6.13
1924	6.33	6.47	6.60	6.69	5.83	5.70	5.38	5.41	5.46	5.58	5.32	5.25
1925	5.47	5.33	6.00	6.66	6.25	6.01	5.53	5.50	6.04	5.75	5.85	6.25
1926	7.04	7.07	6.61	6.50	6.22	6.02	5.97	6.13	6.08	6.29	6.33	6.66
1927	6.69	6.53	6.84	7.15	6.98	6.84	6.75	7.44	7.45	7.61	7.90	8.62
1928	9.95	9.73	9.41	8.75	8.67	8.78	9.15	9.76	9.89	9.81	.....	.....

NOTE.—Quotations are arithmetic averages of the Monday quotations published during each month. Quotations—Sept. 1922–Oct. 1923 on "Medium and Common Beef Steers;" Nov. 1923–June 1927 on "Medium and Common Beef Steers, 1,100 pounds down;" July 1927 on "Medium and Common Beef Steers, 800 pounds up."

Source of data: U. S. Dept. Agr. Bur. Agr. Econ. Daily livestock market summary. Mimeographed daily report, published by the Los Angeles Office, Bur. Agr. Econ.

While the seasonal variation is calculated on the basis of five years only, the data for the two cities check fairly closely and a comparison with the actual prices indicates that the indices of seasonal variation as calculated are approximately correct. The five months beginning in December have been above normal at both cities. In San Francisco, May also shows an above-normal index. June, July, and August show lower indices than other months of the year. This sag is caused in part by differences in the quality of cattle. This situation is an illustration of the difficulties involved in analyzing changes in the prices of products not highly uniform in character.

A study of the prices of "medium-grade steers 1100 pounds down" at Chicago does not reveal a well-defined seasonal variation. A close examination of the data reveals the fact that the range between the high and low of the Chicago quotations for mediums is such that the arithmetic mean can hardly be termed an average price. In order that data for the Pacific Coast and Chicago may be made more nearly comparable, seasonal variation for San Francisco, Los Angeles, and Chicago have been calculated on the basis of the low of the quotation range for "medium steers 1100 pounds down" (cols. 3, 5, and 6, table 37).

TABLE 37

INDICES OF SEASONAL VARIATION IN PRICES OF MEDIUM AND COMMON GRADE STEERS AT SAN FRANCISCO, LOS ANGELES, AND CHICAGO, 1922–1927

Month	Medium grade					Common grade		
	San Francisco		Los Angeles		Chicago	San Francisco	Los Angeles	Chicago
	Average quotations	Low of quotations	Average quotations	Low of quotations	Low of quotations			
1	2	3	4	5	6	7	8	9
January	101.6	103.6	101.9	103.9	104.3	103.3	101.7	99.1
February	103.6	103.5	102.0	101.8	102.7	103.1	99.1	99.4
March	103.0	103.3	104.9	104.5	105.1	103.0	103.3	106.4
April	103.4	104.1	103.8	107.3	104.5	102.2	107.8	109.5
May	101.3	102.2	99.0	99.1	106.1	100.8	101.0	112.2
June	96.3	96.4	96.3	95.4	99.9	98.1	98.5	107.5
July	96.3	96.3	95.0	93.8	101.0	96.7	97.1	102.0
August	96.3	96.1	96.1	96.0	91.6	96.6	97.8	94.1
September	98.3	96.9	99.4	97.0	94.1	98.7	98.6	92.3
October	99.1	98.5	99.2	97.8	96.3	99.0	98.4	92.7
November	99.1	93.3	99.8	99.5	94.2	98.9	98.9	89.4
December	101.7	100.8	102.6	103.7	100.3	99.6	97.8	95.4

Cols. 2, 4, 7, 8, and 9, based upon average of high and low quotations for medium steers. Cols. 3, 5, 6 based upon low of quotations for medium steers.

Sources of data: Computations by authors based upon daily quotations published in the U. S. Dept. Agr. Daily Livestock Market Summary. Bur. Agr. Econ. offices at San Francisco, Los Angeles, and Chicago.

The median link relative method has been used in computing the seasonal variation. The average monthly index=100.

The data for San Francisco and Los Angeles check rather closely with the indices calculated on the average quotation (cols. 2 and 4, table 37). Table 37 shows rather clearly that the break at Chicago in the medium grade has come later than on the Los Angeles and San Francisco markets. With the limited data on hand it would appear that steers of this type destined for eastern markets would fare better in price if shipped before the fall months. Data are so limited that a hard and fast rule should not be drawn.

TABLE 38

RELATIVE PRICES AND PURCHASING POWER OF BEEF CATTLE AT CHICAGO, 1910–1927

Year	Native beef steers, all weights		Beef steers, 1200-1500 pounds		Canners and cutters		Stockers and feeders		Fat cows and heifers	
	Relative price	Relative Purchasing power	Relative price	Relative Purchasing power	Relative price	Relative Purchasing power	Relative price	Relative Purchasing power	Relative price	Relative Purchasing power
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	10	11
1910	89.8	87.4	90.6	88.2	85.2	83.0	81.7	79.6	85.7	83.4
1911	84.5	89.2	84.9	89.7	78.3	82.7	80.0	84.5	81.0	85.5
1912	102.4	101.5	106.5	105.6	93.4	92.6	96.0	95.1	97.8	96.9
1913	109.0	107.1	105.8	103.9	116.8	114.7	118.7	116.6	113.6	111.6
1914	114.3	114.4	112.2	112.3	126.4	126.5	123.7	123.8	122.0	122.1
1915	111.0	108.2	110.9	108.1	116.8	113.8	.....	.....	113.6	110.7
1916	125.5	97.3	125.5	97.3	131.9	102.2	121.2	94.0	125.7	97.4
1917	153.2	85.0	159.1	88.2	171.7	95.2	141.4	78.4	153.6	85.2
1918	193.5	97.9	196.4	99.3	199.2	100.8	172.6	87.3	176.9	89.5
1919	204.8	97.5	205.3	97.7	177.2	84.3	182.7	87.0	186.2	88.6
1920	175.7	76.3	181.9	79.1	138.7	60.3	150.7	65.5	159.2	69.2
1921	108.3	72.4	106.5	71.2	79.7	53.3	108.6	72.6	100.6	67.2
1922	118.9	78.5	120.4	79.5	86.5	57.1	112.0	73.9	106.1	70.0
1923	126.2	80.6	126.1	80.6	85.2	54.4	110.3	70.5	110.8	70.8
1924	126.8	83.2	123.6	81.1	82.4	54.1	106.9	70.1	106.1	69.6
1925	139.4	87.1	138.2	86.4	92.0	57.5	114.5	71.6	117.3	73.3
1926	128.1	83.2	123.6	80.3	115.4	74.9	124.6	80.9	125.7	81.6
1927	154.6	103.8	160.3	107.6	138.7	93.1	146.3	98.2	147.1	98.7

Source of data: Actual prices upon which relatives in cols. 2, 4, 6, and 8 are calculated are from Chicago Daily Drovers Journal. The yearly prices are not weighted. Drovers Journal Yearbook of Figures **1927**: 1-109. 1928. Base 1910–1914=100. Cols. 3, 5, 7, 9, 11—relatives in cols. 2, 4, 6, 8, and 10 divided by all-commodity index. Base 1910–1914=100.

Studies made by Hopkins[38] on the seasonal variation in the prices of 1200 to 1500 pound steers revealed a low point in general in February followed by rapidly rising prices until August and September, after which a downward movement sets in until February. The movement is explained by the number and the quality of the cattle marketed. According to the same author, prices of feeder cattle reach

[38] Hopkins, John A., Jr. An economic study of the cattle feeding enterprise in Iowa. Iowa Agr. Exp. Sta. Bul. 242: 1–46. 1927.

a low point in the late fall and winter months at Chicago, which is explained by the heavy runs of range cattle during this season and the low prices prevailing in the whole cattle market. The seasonal high point in feeder prices is usually reached in May on the Chicago market. This variation is confirmed by studies made by the authors in the seasonal variation of the prices of common steers at Chicago since 1922.

Wholesale Prices at Chicago.—On account of the availability of long series of data on wholesale prices of livestock at Chicago (table 38) it has been possible to make general comparisons between grades of cattle appearing on that market. These prices do not represent prices paid to producers; it is highly probable that the latter would not be so favorable as these wholesale prices. Evidence on this point can be obtained from table 34 (p. 74). The New York State College of Agriculture[39] has pointed out that the spread between the retail price and the farm price has increased greatly since the pre-war period 1910–1914, which would indicate a somewhat higher relative wholesale price when compared with the relative farm price. Table 38 shows distinctly that there has been an increasing spread between the wholesale prices of the better and poorer grades of cattle at Chicago. For example, the purchasing power of canners and cutters during 1927 was 93.1, while that of beef steers weighing between 1200 and 1500 pounds was 107.6. The retail prices of the choicer cuts are reflected in the wholesale prices of the better grades of cattle (tables 38 and 42).

Prices of Purebreds.—The United States Department of Agriculture has endeavored to obtain from a large and representative number of breeders sale prices (both at auction and private treaty) of purebred beef animals in the United States. Reports on the sales of 2,914 Aberdeen Angus, 17,935 Hereford, 495 Red Polled and 9,126 Shorthorn cattle in 1927 gave results as shown in table 39. In general, prices for beef cattle were materially higher in 1927 than in the three preceding years, but not so high as they were in 1923. The 1927 report showed that 60 per cent of the purebred beef cattle sales in 1927 were made in the north central states, 21 per cent in the southern state, 16 per cent in the mountain and Pacific states and 3 per cent in the north Atlantic states.

Prices of purebred Shorthorn cattle sold at public auction in the United States have been tabulated by J. H. Knox of the Illinois

[39] Warren, G. F., and F. A. Pearson. Cost of distributing food. New York State Col. Agr. Farm Economics 2(50): 830–836. 1928.

Agricultural Experiment Station.[40] An analysis of these prices gives indications that they lag from 1 to 2 years after the price of the common farm cattle. The lag in the prices of purebred Shorthorn bulls seems to be even greater. This condition is caused by the fact that prices of purebred beef animals are the results of the demand for beef steers. Hence prices for purebreds generally rise and fall later than those for steers. From this study it would appear that changes in the prices of purebred Shorthorns are more violent than the price changes of common beef cattle. The prices of purebreds are bid proportionately higher than the price of common beef cattle when the latter is rising as farmers are encouraged to improve their herds. Conversely, the drop in prices during periods of overproduction will be greater as the farmer demand will then cease.

TABLE 39

Comparative Percentages of Sales of the Combined Purebred Beef-Cattle Breeds, United States, 1923–1927, by Price Ranges

Year	Below $50	$50-$250	$250 and above
1923	16.4	77.9	5.7
1924	21.7	76.2	2.1
1925	25.2	73.1	1.7
1926	11.9	86.6	1.5
1927	6.6	89.5	3.9

Source of data: U. S. Dept. Agr. Prices of purebred cattle, hogs, and sheep. U. S. Dept. Agr. Crops and Markets 4: 140–141. 1927; 1927 data from U. S. Dept. Agr. Prices of purebred beef cattle, mimeographed report, April 4, 1928.

MEAT PRICES

It has been pointed out that beef cattle prices until the latter part of 1927 have been relatively low since 1915 if prices are referred to a 1910–1915 base and compared with the prices of all commodities. It will be of interest to analyze wholesale and retail meat prices in order to see if the relatively low prices for live animals have been reflected in relatively low wholesale and retain meat prices. Since data are available for other classes of meat than beef, comparisons may shed some light on the demand for various meats.

[40] Ulrey, O. Prices of pure-bred Shorthorn cattle and common beef cattle. New York Agr. Exp. Sta. Farm Economics 2(43): 651–654. 1927.

TABLE 40

AVERAGE AND RELATIVE WHOLESALE PRICES OF CERTAIN MEATS AT NEW YORK AND CHICAGO, 1910–1928

(Prices are in dollars per pound; relative price 1913 = 100.)

Year	Carcass, good native steers, Chicago		Native sides, New York		Hams, smoked, Chicago		Lamb, dressed, Chicago		Mutton, dressed, New York		Pork loins, Chicago		Veal: fresh		
													Good to prime, New York	Good, Chicago	
	Price	Rel. price	Price	Rel. price	Price	Rel. price	Price	Rel. price	Price	Rel. price	Price	Rel. price	Price	Price	Rel. price
1910	0.115	89.1	0.103	82.0	0.164	98.9	.....	.....	0.101	98.0	.....	.....	.....	.....	.....
1911	0.112	86.6	0.098	78.4	0.140	84.1	.....	.....	0.075	73.4	.....	.....	.....	.....	.....
1912	0.133	102.6	0.121	96.9	0.143	86.0	.....	.....	0.084	81.9	.....	.....	.....	.....	.....
1913	0.130	100.0	0.125	100.0	0.166	100.0	0.149	100.0	0.103	100.0	0.149	100.0	0.181	.....	100.0
1914	0.136	105.3	0.135	107.5	0.167	100.5	0.152	101.9	0.101	98.5	0.154	101.9	0.185	.....	102.2
1915	0.129	99.5	0.126	100.2	0.153	92.1	0.164	110.0	0.107	104.7	0.143	110.0	0.182	.....	100.8
1916	0.138	106.7	0.134	106.9	0.185	111.3	0.183	123.0	0.125	122.0	0.162	123.0	0.190	.....	105.3
1917	0.167	129.1	0.164	131.0	0.252	151.6	0.240	161.2	0.166	162.3	0.244	161.2	0.226	.....	125.1
1918	0.221	170.9	0.209	166.5	0.318	191.5	0.270	181.8	0.198	193.4	0.295	181.8	0.274	.....	151.4
1919	0.233	180.2	0.215	171.6	0.343	206.6	0.277	186.3	0.167	162.7	0.315	186.3	0.302	.....	166.9
1920	0.230	177.9	0.206	164.4	0.334	201.0	0.291	195.8	0.162	158.2	0.307	195.8	0.316	.....	174.9
1921	0.163	125.6	0.148	118.5	0.268	161.1	0.205	137.7	0.104	101.2	0.225	137.7	0.301	.....	166.6
1922	0.150	115.9	0.138	110.1	0.264	159.1	0.255	171.1	0.120	116.7	0.214	171.1	0.300	0.154	165.9
1923	0.158	122.1	0.145	116.1	0.212	127.3	0.253	170.3	0.119	116.2	0.180	170.3	.....	0.165	178.0
1924	0.171	131.8	0.151	120.4	0.202	121.5	0.251	169.0	0.145	141.7	0.192	169.0	.....	0.155	166.9
1925	0.180	139.2	0.159	126.6	0.271	163.0	0.269	181.0	0.144	140.5	0.250	181.0	.....	0.164	176.5
1926	0.164	126.8	0.151	120.3	0.308	185.1	0.262	175.9	0.144	140.7	0.278	175.9	.....	0.187	201.2
1927	0.186	143.1	0.201*	141.6	0.246	148.2	0.262	175.9	0.141	136.9	0.190*	160.1	.....	0.197	212.9
1928	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Jan.	0.220	169.2	0.230	163.1	0.212	127.7	0.230	154.4	0.133	129.1	0.143	120.4	.....	0.198	213.0
Feb.	0.212	163.1	0.230	163.1	0.210	126.5	0.255	171.1	0.145	140.8	0.137	115.4	.....	0.227	244.1
Mar.	0.205	157.7	0.221	156.7	0.207	124.7	0.274	183.9	0.164	159.2	0.137	115.4	.....	0.198	213.0
Apr.	0.200	153.8	0.222	157.4	0.201	121.1	0.300	201.3	0.184	178.6	0.158	133.0	.....	0.195	210.0
May	0.201	154.6	0.229	162.4	0.206	124.1	0.310	208.1	0.167	162.1	0.172	144.8	.....	0.205	220.8
June	0.212	163.1	0.225	159.5	0.215	129.5	0.316	212.1	0.148	143.7	0.174	146.5	.....	0.216	232.8
July	0.229	176.2	0.249	176.5	0.236	142.2	0.303	203.4	0.143	138.8	0.197	165.9	.....	0.226	243.5
Aug.	0.244	187.7	0.260	184.3	0.249	150.0	0.380	255.0	0.148	143.7	0.213	179.4	.....	0.255	274.7

* Classifications changed (1) Native sides, New York to good beef, New York (2) Pork loins, Chicago to fresh pork, Chicago.

Sources of data: 1910–1926, U. S. Dept. Labor Wholesale Prices, 1890–1926. Bur. Labor Stat. Bul. **440**: 1–256. 1927. 1927–1928, Bur. Labor Stat. Wholesale prices of commodities. Monthly publications.

Wholesale Prices at Chicago and New York.—Series of data on wholesale prices of meat are available, unfortunately, for only a limited number of localities. None of the places listed are on the Pacific Coast, but over long periods of time prices for commodities, such as meat, which are produced in many sections of the country and which can be transported easily, do not move very far out of line in the different localities. Table 40 indicates clearly that carcass prices at Chicago and native side prices at New York have been relatively low—whether these are compared with the prices of general commodities or with the prices of other meats. It is unfortunate that the data in table 40 had to be compared to a 1913 base. Earlier data are not completely available. In the case of the two series above mentioned the relative prices would still be relatively low if the base 1910–1914 had been used. It is also of importance to note that from 1917 to 1927 the wholesale prices of beef were relatively lower than those for lamb, pork, and veal. Only since the latter part of 1927 have the relative prices of wholesale beef approached those of other meats.

TABLE 41

INDEX NUMBERS SHOWING TREND IN THE RETAIL COST OF FOOD IN THE UNITED STATES, 1890–1927

(Average for year 1913 = 100.)

Year	Index number	Year	Index number	Year	Index number	Year	Index number
1890	69.6	1901	71.5	1912	97.6	1923	146.2
1891	70.6	1902	75.4	1913	100.0	1924	145.9
1892	69.3	1903	75.0	1914	102.4	1925	157.4
1893	71.0	1904	76.0	1915	101.3	1926	160.6
1894	67.8	1905	76.4	1916	113.7	1927	155.4
1895	66.5	1906	78.7	1917	146.4	1928—January	155.1
1896	64.9	1907	82.0	1918	168.3	February	151.6
1897	65.4	1908	84.3	1919	185.9	March	151.4
1898	67.1	1909	88.7	1920	203.4	April	152.1
1899	67.7	1910	93.0	1921	153.3	May	153.8
1900	68.7	1911	92.0	1922	141.6	June	152.6
						July	152.8

Sources of data: 1890–1925, U. S. Dept. Labor, Retail Prices. 1890–1925, Bur. Labor Stat. Bul. **418**: 6. 1926, ibid. Bul. **445**: 6. 1927. 1927, U. S. Dept. Labor, Bur. Labor Statistics. Indexes of retail prices of food in the United States. Monthly Labor Review **27** (1): 151. 1928.

Retail Prices in the United States and California.—Compared with the relative retail prices of other meats those for the various cuts of beef have been low both (until the latter part of 1927) in the United States (table 42) and on the San Francisco (table 43) and Los

Angeles (table 44) markets. It is unfortunate that data are not available for the period before 1913, since there is no especial reason for believing that 1913 was a normal year other than the fact that it was the year before the outbreak of the European War. If any one or all of the four years 1913–1916 had been taken as a base, however, the same general conclusions might have been drawn. With the outbreak of the war and since that time retail prices of the various cuts of beef in the country have failed to reach the relative position which other classes of meat have attained. Statements are often heard that meat is high in price as compared with the pre-war period. For beef this has not been true. From 1922 until 1927 sirloin stead has kept about the same relative level as the general prices of retail foods (table 41). Available data on other cuts of meat serve to indicate that until 1927 retail prices for these cuts were relatively lower than the retail prices of other foods. The lower valued cuts of beef have been especially low in prices (see chuck roast and plate beef in table 42). With the prosperity which the nation has enjoyed during the past four years some explanation can be offered for the greater demand for the higher prices cuts of beef. Considerable improvement is to be noted in the retail prices of the beef cuts listed since 1922 (tables 42, 43, 44).

One of the important factors contributing to low beef prices has been the propaganda urging consumers to eat less meat or to make substitutions for it. Some of the statements made in this connection have been gross misrepresentations. Another very important factor has been the relatively weak demand for the low-priced cuts (table 42). The producer of beef should take cognizance of this and aim to produce as high-grade beef as possible.

COLD STORAGE OF BEEF

United States.—Compared with the total production of beef, storage holdings are small. There is a well-defined seasonal variation. Stocks usually begin to accumulate during the fall of the year when larger supplies arrive on the markets (fig. 25). The peak in holdings is generally reached about January first. From January until the late summer or early fall beef is gradually withdrawn from the coolers. It is of interest to note the large volume of beef which was stored during the latter war years together with the rapid reduction of holdings during 1920.

TABLE 42

AVERAGE AND RELATIVE RETAIL PRICES OF CERTAIN MEATS IN THE UNITED STATES, 1913–1928

(Prices are in cents per pound; relative price 1913 = 100.)

Year	Leg of lamb		Sirloin steak		Round steak		Rib roast		Chuck roast		Plate beef		Pork chops		Bacon, sliced		Ham, sliced		Hens	
	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price
1913	18.9	100.0	25.4	100.0	22.3	100.0	19.8	100.0	16.0	100.0	12.1	100.0	21.0	100.0	27.0	100.0	26.9	100.0	21.3	100.0
1914	19.5	103.2	25.9	102.0	23.6	105.8	20.4	103.0	16.7	104.4	12.6	104.1	22.0	104.6	27.5	101.8	27.3	101.7	21.8	102.2
1915	20.4	107.9	25.7	101.1	23.0	103.0	20.1	101.4	16.1	100.6	12.1	100.0	20.3	96.4	26.9	99.8	26.1	97.2	20.8	97.5
1916	22.6	119.6	27.3	107.5	24.5	109.7	21.2	107.4	17.1	106.9	12.8	106.0	22.7	108.3	28.7	106.4	29.4	109.2	23.6	110.7
1917	28.9	152.9	31.5	124.0	29.0	129.8	24.9	125.5	20.9	130.6	15.7	129.8	31.9	151.7	41.0	151.9	38.2	142.2	28.6	134.5
1918	34.9	184.7	38.9	153.4	36.9	165.5	30.7	155.1	26.6	166.3	20.6	170.2	39.0	185.7	52.9	195.9	47.9	178.1	37.7	177.0
1919	36.5	193.1	41.7	164.2	38.9	174.4	32.5	164.1	27.0	168.8	20.2	166.9	42.3	201.4	55.4	205.2	53.4	198.5	41.1	193.0
1920	39.3	207.9	43.7	172.1	39.5	177.1	33.2	167.7	26.2	163.8	18.3	151.2	42.3	201.4	52.3	193.7	55.5	206.3	44.7	209.9
1921	33.7	178.3	38.8	152.8	34.4	154.3	29.1	147.0	21.2	132.5	14.3	118.2	34.9	166.2	42.7	158.2	48.8	181.4	39.7	186.4
1922	36.6	193.7	37.4	147.2	32.3	144.8	27.6	139.4	19.7	123.1	12.8	105.8	33.0	157.1	39.8	147.4	48.8	181.4	36.0	169.0
1923	36.7	194.2	39.1	153.9	33.5	150.2	28.4	143.4	20.2	126.3	12.9	106.6	30.4	144.8	39.1	144.8	45.5	169.1	35.0	164.3
1924	37.1	196.3	39.6	155.9	33.8	151.6	28.8	145.5	20.8	130.0	13.2	109.1	30.8	146.7	37.7	139.6	45.3	168.4	35.3	165.7
1926	38.6	204.2	40.6	159.8	34.7	155.6	29.6	149.5	21.6	135.0	13.8	114.1	36.6	174.3	46.7	173.0	52.6	195.5	36.6	171.8
1926	39.0	206.3	41.3	162.6	35.6	159.6	30.3	153.0	22.5	140.6	14.6	120.7	39.5	188.1	50.3	186.3	57.4	213.4	38.8	182.2
1927	38.9	205.8	42.6	167.7	37.1	166.4	31.3	158.1	23.7	148.1	15.4	127.3	36.8	175.2	47.2	174.8	55.0	204.5	36.9	173.2
1928—January	37.4	197.0	44.4	174.8	38.6	173.1	32.7	165.2	25.4	158.8	17.2	142.1	31.3	149.0	44.6	165.2	51.7	192.2	36.8	172.8
February	37.5	198.0	44.8	176.4	38.9	174.4	33.1	167.2	25.7	160.6	17.5	144.6	29.5	140.5	43.7	161.9	51.2	190.3	37.2	174.6
March	38.2	202.0	44.9	176.8	39.1	175.3	33.1	167.2	25.8	161.3	17.7	146.3	28.6	136.2	43.0	159.3	50.5	187.7	37.2	174.6
April	39.8	210.0	45.3	178.3	39.6	177.6	33.5	169.2	26.1	163.1	17.9	147.9	31.3	149.0	42.9	158.9	50.7	188.5	37.7	177.0
May	41.5	219.6	46.1	181.5	40.4	181.2	34.1	172.2	26.6	166.3	18.2	150.4	35.4	168.6	43.1	159.6	51.2	190.3	37.7	177.0
June	42.2	223.3	47.4	186.6	41.6	186.5	34.7	175.3	27.6	172.5	18.5	152.9	34.8	165.7	43.2	160.0	51.7	192.2	37.1	174.2
July	41.1	217.5	49.7	195.7	43.9	196.9	36.0	181.8	28.9	180.6	19.1	157.9	37.3	177.6	43.9	162.6	53.4	198.5	36.7	172.3

Sources of data: 1913–1925, U. S. Dept. Labor Retail Prices, 1890–1925. Bur. Labor Stat. Bul. **416**: 38–41. 1926; 1926–1927, U. S. Dept. Labor Bur. Labor Stat. Index numbers of principal articles of food. Monthly Labor Review **27** (1): 151. 1928. 1928, U. S. Dept. Labor. Average retail prices of principal articles of food. Monthly Labor Reviews.

TABLE 43

AVERAGE AND RELATIVE PRICES OF CERTAIN MEATS IN SAN FRANCISCO, 1913–1928

(Prices are in cents per pound; relative price 1913 = 100.)

Year	Leg of lamb		Sirloin steak		Round steak		Rib roast		Chuck roast		Plate beef		Pork chops		Bacon, sliced		Ham, sliced		Hens	
	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price
1913	16.9	100	20.7	100	19.3	100	21.0	100	14.9	100	13.5	100	23.6	100	33.7	100	31.0	100	24.2	100
1914	18.3	108	20.8	100	19.9	103	21.8	104	15.5	104	14.9	110	24.8	105	34.6	103	32.8	106	24.4	101
1915	18.1	107	20.8	100	19.8	103	21.3	101	14.7	99	13.7	101	23.5	100	33.8	100	34.0	110	24.3	100
1916	19.6	116	20.5	99	19.5	101	20.7	99	14.1	95	13.2	98	23.4	99	34.8	103	34.4	111	26.3	109
1917	25.8	153	23.1	112	22.6	117	22.6	108	16.0	107	15.4	114	31.6	134	44.6	132	43.0	139	28.9	119
1918	32.7	193	30.6	148	30.1	156	28.8	137	22.3	150	20.7	153	40.5	172	57.1	169	52.1	168	42.1	174
1919	33.3	197	31.1	150	30.0	155	29.7	141	22.0	148	19.7	146	45.0	191	61.5	182	58.1	187	48.7	201
1920	35.2	208	32.6	157	30.8	160	31.1	148	21.7	146	18.4	136	45.2	192	62.2	185	59.8	193	50.4	208
1921	31.7	188	30.3	146	28.0	145	28.7	137	18.6	125	15.1	112	40.2	170	56.0	166	54.8	177	46.2	191
1922	34.8	206	30.4	147	27.4	142	28.3	135	18.3	123	14.1	104	38.4	163	53.7	159	55.4	179	40.5	167
1923	34.8	206	29.9	144	27.0	140	28.7	137	17.8	120	13.8	102	35.9	152	50.4	150	52.1	168	40.4	167
1924	35.4	210	31.0	150	28.2	146	29.6	141	18.7	126	14.7	109	36.3	154	49.8	148	52.9	171	41.0	169
1925	38.7	229	31.8	154	28.6	148	30.4	145	19.5	131	15.3	113	42.9	182	58.9	175	61.1	197	42.1	174
1926	37.8	224	32.0	155	29.4	152	29.8	142	19.0	128	15.0	111	45.0	191	63.6	189	66.4	214	44.7	185
1927	38.3	227	35.2	170	30.8	160	30.9	147	20.2	136	15.9	118	42.7	181	58.5	174	64.1	207	43.3	179
1928—January	39.9	236	37.3	180	34.4	178	33.9	161	23.7	159	19.1	141	39.3	167	56.6	168	61.1	197	43.2	179
February	39.4	233	36.9	178	35.4	183	33.7	160	23.4	157	19.1	141	36.8	156	55.5	165	60.2	194	43.0	178
March	39.5	234	37.7	182	35.6	184	34.2	163	23.7	159	18.8	139	36.0	153	54.8	163	59.8	193	53.2	179
April	40.4	239	37.7	182	35.6	184	33.9	161	23.6	158	18.6	137	36.9	156	54.8	163	58.9	190	42.4	175
May	39.9	236	37.5	181	35.1	182	33.5	160	22.5	151	17.8	132	38.5	163	54.5	162	59.7	193	42.4	175
June	39.2	232	37.1	179	34.5	179	33.1	158	21.8	146	16.9	125	39.5	167	54.6	162	60.0	194	42.0	174
July	39.0	231	37.3	180	34.7	180	33.0	157	22.4	150	17.4	129	41.6	176	54.6	162	60.7	196	41.1	170

Sources of data: 1913–1919. U. S. Dept. Labor. Retail prices in the U. S. Bur. Labor Stat. Bul. **270**: 402–405. 1921; 1920, ibid. Bul. **300**: 135, 158. 1922; 1921–1922, ibid. Bul. **315**: 142, 165. 1923; 1923, ibid. Bul. **334**: 135, 157. 1924; 1924, ibid. Bul. **396**: 160, 207. 1926; 1925–1927, ibid. Bul. **445**: 148, 149, 195. 1927. 1928, U. S. Dept. Labor Bur. Labor Stat. Average retail prices of principal articles of food. Monthly Labor Review **26** (6): 163. 1928. 1928, U. S. Dept. Labor. Average retail prices of principal articles of food. Monthly Labor Reviews.

TABLE 44

AVERAGE AND RELATIVE RETAIL PRICES OF CERTAIN MEATS IN LOS ANGELES, 1913–1928

(Prices are in cents per pound; relative price 1913 = 100.)

Year	Leg of lamb		Sirloin steak		Round steak		Rib roast		Chuck roast		Plate beef		Pork chops		Bacon, sliced		Ham, sliced		Hens	
	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price	Price	Relative price
1913	18.8	100	23.5	100	20.8	100	18.3	100	15.7	100	12.6	100	25.1	100	33.7	100	35.3	100	26.6	100
1914	19.1	102	23.4	100	21.2	102	19.8	108	16.2	103	13.2	105	26.0	104	34.1	101	35.6	101	27.1	102
1915	18.4	98	22.6	96	20.1	97	19.0	104	15.3	97	12.3	98	24.1	96	33.5	99	34.1	97	25.6	96
1916	20.8	111	23.5	100	21.0	101	20.0	109	16.0	102	12.6	100	25.1	100	34.6	103	36.0	102	26.7	100
1917	26.7	142	26.8	114	23.1	111	22.1	121	18.3	117	15.0	119	23.9	131	46.1	137	46.3	131	29.1	109
1918	32.5	173	31.8	135	29.7	143	27.7	151	23.0	147	19.0	151	42.0	167	59.9	178	56.9	161	39.2	147
1919	32.4	172	33.5	143	30.5	147	28.7	157	22.5	143	18.3	145	46.2	184	63.8	189	62.0	176	46.3	174
1920	35.5	189	36.9	157	32.4	156	30.8	168	22.4	143	17.9	142	48.9	195	62.8	186	65.8	186	49.0	184
1921	31.4	167	34.9	149	29.9	144	29.3	160	19.2	122	14.8	117	41.3	165	54.2	161	60.8	172	44.8	168
1922	32.5	173	34.2	146	28.2	136	28.3	155	17.8	113	12.8	102	38.6	154	51.5	153	61.2	173	41.3	155
1923	33.3	177	33.8	144	27.6	133	28.1	154	17.7	113	12.9	102	36.9	147	49.8	148	58.0	164	39.7	149
1924	33.8	180	35.3	150	29.1	140	28.8	157	19.5	124	13.9	110	37.8	151	47.7	142	58.4	165	40.2	151
1925	37.0	197	36.5	155	29.7	143	28.6	156	19.2	122	13.7	109	44.3	177	54.9	163	63.9	181	42.0	158
1926	36.9	196	36.6	156	30.0	144	29.4	161	19.9	127	14.3	114	45.7	182	59.3	176	69.2	196	44.4	167
1927	36.7	195	38.0	162	31.1	150	30.0	164	20.9	133	14.5	115	43.5	173	55.3	164	68.4	194	42.8	161
1928—January	37.3	198	41.3	176	34.1	164	32.5	178	24.0	153	17.2	137	39.3	157	53.3	158	66.6	189	43.8	165
February	37.4	199	41.6	177	34.2	164	32.4	177	24.4	155	17.6	140	34.0	135	50.4	150	64.2	182	43.1	162
March	37.4	199	41.1	175	34.3	165	33.0	186	24.6	157	18.0	143	34.0	135	49.1	146	63.7	180	43.4	163
April	37.9	201	40.9	174	33.7	162	32.3	177	24.1	153	16.7	132	36.6	146	47.8	142	62.4	177	43.5	163
May	37.6	200	41.5	177	33.6	162	32.6	178	23.6	150	15.9	126	40.3	161	48.1	143	63.6	180	42.3	159
June	37.6	200	41.3	176	33.7	162	32.8	179	23.2	148	16.0	127	41.3	165	49.0	145	64.7	183	42.6	160
July	37.5	199	41.9	177	34.2	164	33.4	183	23.8	152	16.8	133	46.3	184	51.5	153	69.0	195	41.1	165

Sources of data: 1913–1919. U. S. Dept. Labor. Retail prices in the U. S. Bur. Labor Stat. Bul. **270**: 228–231. 1921; 1920, ibid. Bul. **300**: 111–149. 1922; 1921–1922, ibid. Bul. **315**: 118–156. 1923; 1923, ibid. Bul. **334**: 111–149. 1924; 1924, ibid. Bul. **396**: 112–189. 1926; 1925–1927, ibid. Bul. **445**: 100, 101, 177. 1927. 1928, U. S. Dept. Labor Bur. Labor Stat. Average retail prices of principal articles of food. Monthly Labor Review **26** (6): 158. 1928. 1928, U. S. Dept. Labor Bur. Labor Stat. Average retail prices of principal articles of food. Monthly Labor Reviews.

It is apparent that the cold storage of beef has the effect of evening out supplies for consumption and in all probability has some effect on prices. The coolers begin to receive beef in the fall when prices at Chicago are relatively low and supplies large. As the prices of fresh beef approach the seasonal high beef is removed from the coolers, and supplies reach the low point about August or September first.

Stocks of Frozen Beef in Cold-Storage Warehouses and Meat-Packing Establishments, and Beef in Cure and Process of Cure, United States, 1917–1927

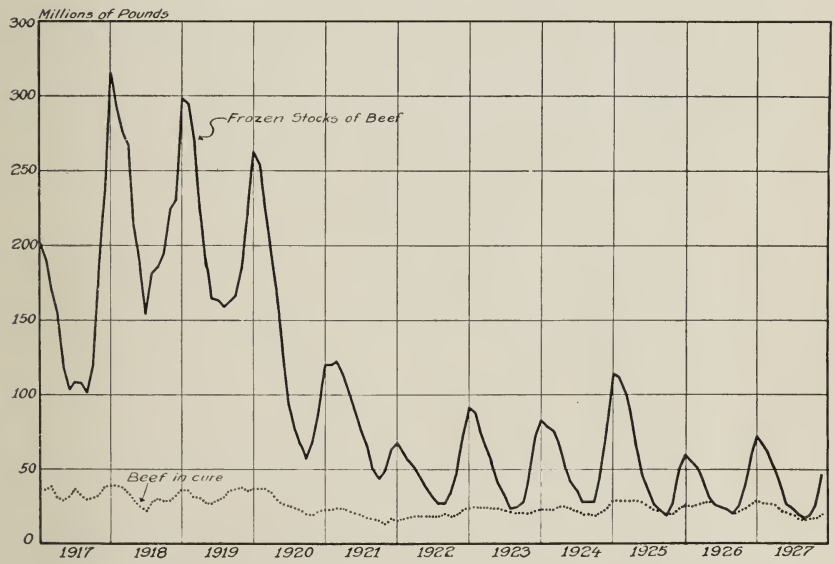


Fig. 25.—With the larger receipts coming on the market during the last three or four months of the year a surplus of beef accumulates. This is placed in storage until a peak is reached about the first of each year. Lighter supplies of cattle in the spring of the year cause beef to be removed from storage, a low point in frozen stocks being reached in late summer or early fall. The beef in cure and process of cure does not give evidence of a well-defined seasonal variation.

(Data from U. S. Dept. Agr. Beef—frozen stocks in cold storage warehouses. Yearbook of Agriculture **1926**: 1060. 1927. Current data from U. S. Dept. Agr. Crops and Markets.)

Data since 1917 for cured beef and that in the process of cure fail to show large seasonal variations (fig. 25). In general, the movement of beef in the process of cure corresponds to that of stocks in storage, although the seasonal movement is not so pronounced in the former as in the latter case.

TABLE 45

MONTHLY CATTLE AND CALF RECEIPTS AT ALL PUBLIC STOCKYARDS AND PERCENTAGE MONTHLY RECEIPTS, 1915–1928

MONTHLY RECEIPTS

(Thousands, i. e. 000 omitted)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1915	1,029	768	1,017	987	1,111	1,113	1,039	1,246	1,531	1,818	1,724	1,170	14,553
1916	1,202	1,055	1,201	1,151	1,385	1,319	1,154	1,584	1,779	2,409	1,977	1,460	17,676
1917	1,696	1,302	1,330	1,539	1,961	1,759	1,729	1,814	2,357	3,054	2,626	1,899	23,066
1918	1,727	1,498	1,713	2,046	1,863	1,815	2,128	2,024	2,826	2,865	2,648	2,142	25,295
1919	2,119	1,453	1,517	1,767	1,836	1,588	2,016	2,039	2,396	3,008	2,702	2,182	24,623
1920	1,881	1,480	1,663	1,557	1,778	1,879	1,671	1,962	2,294	2,209	2,428	1,395	22,197
1921	1,644	1,190	1,566	1,494	1,542	1,580	1,343	1,867	1,906	2,310	1,928	1,417	19,787
1922	1,628	1,417	1,622	1,470	1,878	1,759	1,709	2,149	2,397	2,936	2,427	1,825	23,217
1923	1,877	1,427	1,502	1,670	1,900	1,629	1,903	2,214	2,295	2,802	2,182	1,810	23,211
1924	1,888	1,457	1,556	1,751	1,890	1,673	1,798	1,934	2,566	2,736	2,363	2,083	23,695
1925	1,869	1,530	1,860	1,826	1,737	1,746	1,970	2,245	2,157	2,789	2,282	2,056	24,067
1926	1,840	1,551	1,811	1,711	1,894	1,871	1,820	1,997	2,397	2,674	2,460	1,846	23,872
1927	1,832	1,555	1,743	1,674	1,955	1,732	1,547	2,075	1,988	2,635	2,346	1,691	22,762
1928	1,771	1,516	1,465	1,685	1,798	1,558	1,650	1,828	.....	.....	.....	.....	.....

Percentage Monthly Receipts

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1915	7.07	5.28	6.99	6.78	7.63	7.65	7.14	8.56	10.52	12.49	11.85	8.04
1916	6.80	5.97	6.79	6.51	7.84	7.46	6.53	8.96	10.06	13.63	11.18	8.26
1917	7.35	5.64	5.77	6.67	8.50	7.63	7.50	7.86	10.22	13.24	11.38	8.23
1918	6.83	5.92	6.77	8.09	7.37	7.18	8.41	8.00	11.17	11.33	10.47	8.47
1919	8.61	5.90	6.16	7.18	7.46	6.45	8.19	8.28	9.73	12.22	10.97	8.86
1920	8.47	6.67	7.49	7.01	8.01	8.47	7.53	8.84	10.33	9.95	10.94	6.28
1921	8.31	6.01	7.91	7.55	7.79	7.99	6.79	9.44	9.63	11.67	9.74	7.16
1922	7.01	6.10	6.99	6.33	8.09	7.58	7.36	9.26	10.32	12.64	10.45	7.86
1923	8.09	6.15	6.47	7.19	8.19	7.02	8.20	9.54	9.89	12.07	9.40	7.80
1924	7.97	6.15	6.57	7.39	7.98	7.06	7.59	8.16	10.83	11.55	9.97	8.79
1925	7.77	6.36	7.73	7.59	7.22	7.25	8.19	9.33	8.96	11.59	9.48	8.54
1926	7.71	6.50	7.59	7.17	7.93	7.84	7.62	8.37	10.04	11.20	10.30	7.73
1927	8.05	6.83	7.66	7.35	8.59	7.61	6.80	9.12	8.73	11.58	10.31	7.43

Sources of data: Monthly receipts 1915–1926, U. S. Dept. Agr. Receipts of cattle and calves at public stockyards. Yearbook **1926**: 1042. 1927. 1927–1928. U. S. Dept. Agr. Crops and Markets. Percentage monthly receipts computed by authors.

MOVEMENTS OF CATTLE

Market Receipts at Public Stockyards.—Receipts at the public stockyards of the country at which records of receipts have been kept over a considerable period of years give indications of distinct seasonal movement (table 45). While such data may give some indication of total supplies, interpretations might be misleading unless considered in conjunction with stocker and feeder shipments (table 46). Generally speaking, the four months—August to November inclusive—are

the months of above-normal receipts. A large portion of these receipts are stocker and feeder cattle, as indicated by the heavy shipments during this same period. California producers will be interested in receipts during the months April to July (table 45), on account of the surplus which at times is available in this state during years of superior natural feed.

TABLE 46

Cattle and Calves: Stocker and Feeder Shipments from Public Stockyards and Percentage Monthly Shipments, United States, 1916–1928

SHIPMENTS

(Thousands, i. e., 000 omitted)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1916	221	197	250	262	289	264	171	330	464	682	461	256	3,847
1917	260	213	249	306	401	353	262	330	588	768	729	344	4,803
1918	222	214	319	385	491	393	274	418	604	704	623	366	5,013
1919	364	264	277	391	442	272	236	397	611	839	723	470	5,286
1920	349	240	241	244	323	272	218	314	488	580	553	280	4,102
1921	205	166	236	238	214	209	122	355	395	622	497	245	3,504
1922	233	243	282	235	359	259	223	469	630	864	710	357	4,864
1923	281	210	199	233	300	234	223	480	631	785	624	353	4,553
1924	243	170	174	239	275	201	169	306	580	763	549	309	3,978
1925	207	176	230	271	216	154	243	360	427	717	489	333	3,823
1926	225	177	184	202	218	169	198	252	522	694	570	301	3,712
1927	205	175	200	204	284	170	138	269	407	675	615	319	3,613
1928	233	194	173	254	236	183	196	336	.....	.....	.....	.....	.....

Percentage Monthly Shipments

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1916	5.74	5.12	6.50	6.81	7.51	6.86	4.45	8.58	12.06	17.73	11.98	6.65
1917	5.41	4.43	5.18	6.37	8.35	7.35	5.45	6.87	12.24	15.99	15.18	7.16
1918	4.43	4.27	6.36	7.68	9.79	7.84	5.47	8.34	12.05	14.04	12.43	7.30
1919	6.89	4.99	5.24	7.40	8.36	5.15	4.46	7.51	11.56	15.87	13.68	8.89
1920	8.51	5.85	5.88	5.95	7.87	6.63	5.31	7.65	11.90	14.14	13.48	6.83
1921	5.85	4.73	6.74	6.79	6.11	5.96	3.48	10.13	11.27	17.75	14.18	7.00
1922	4.79	5.00	5.80	4.83	7.38	5.32	4.58	9.64	12.95	17.76	14.60	7.34
1923	6.17	4.61	4.37	5.12	6.59	5.14	4.90	10.54	13.86	17.24	13.71	7.75
1924	6.11	4.27	4.37	6.01	6.91	5.05	4.25	7.69	14.58	19.18	13.80	7.77
1925	5.41	4.60	6.02	7.09	5.65	4.03	6.36	9.42	11.17	18.75	12.79	8.71
1926	6.06	4.77	4.96	5.44	5.87	4.55	5.33	6.79	14.06	18.70	15.36	8.11
1927	5.67	4.84	5.54	5.65	7.86	4.71	3.82	7.45	11.26	18.68	17.02	8.83

Sources of data: Shipments, 1916–1926. U. S. Dept. Agr. Stocker and feeder shipments. Yearbook 1926: 1043. 1927. Percentage monthly shipments computed by authors.

Stocker and Feeder Shipments, United States.—A considerable part of the receipts on the cattle markets of the country consist of stocker and feeder cattle which are reshipped from the market to farms and feed lots. This movement is highly seasonal, the fall months being above normal (table 46). The seasonal movement may

be of interest to the California cattleman who at times may be interested in removing the surplus from the market during the grass-cattle season. Shipments in the country at large are relatively light during the spring and summer months until August. During the latter month there is a most pronounced upward turn in the volume of offerings which reach their peak in October. There has been a gradual decrease in the number of shipments since 1922, which has been caused in general by the weak demand for cattle.

The conditions surrounding the corn crop have an important influence on the demand for feeder cattle, as the larger number are fed in the eleven corn-belt states. The United States Department of Agriculture reports at intervals of three months the number of animals on feed in this section. On January 1, 1928, the number of cattle on feed was 6 per cent below that of January 1, 1927. The April 1, 1928 estimate showed a reduction of 4 per cent as compared with the same date a year previous.

Shipments out of Counties, California.—The Cattle Protection Service of the California State Department of Agriculture reports monthly on the number of cows, steers, calves, bulls, and stags shipped out of the various counties of the state. These data should give, over a series of years, a rough approximation of the surplus produced in the various sections of the state during different months of the year. It should be borne in mind that these data in many cases include animals which are not in market condition but which nevertheless must be moved on account of feed conditions, etc. Over a long series of years this information may prove to be of considerable value in anticipating movements from the various sections of the state.

Steers form the largest class of animals shipped out of the different counties both because females are used in larger numbers for replacements and because a large percentage of cows used for beef are slaughtered in the producing sections of the state. On account of the dependence on grass, the movement is highly seasonal; during five months—May to September—approximately 60 per cent (1923—59.4 per cent; 1924—62.3 per cent; 1925—58.8 per cent; 1926—63.7 per cent; 1927—60.3 per cent) of the steers are moved out of the various counties of the state. The month of April is highly variable on account of earliness or lateness of the season. Numbers shipped out during the remaining months of the year are relatively small.

A fairly close correlation has existed between the seasonal movements of cows and those of steers out of the various counties of the state. The six months of April to September, inclusive, for the years

studied (1923–1927) show the largest numbers of cows shipped out of the counties (1923—66.1 per cent; 1924—57.9 per cent (foot-and-mouth disease); 1925—66.8 per cent; 1926—60.7 per cent; 1927—65.6 per cent). February is conspicuously low in this regard. Data are not available over a sufficiently long period of time to show any definite trend, but during the few years studied the number of cows shipped from the counties has increased more rapidly than the number of steers. This situation has resulted to some extent in the depletion of beef herds.

Large numbers of calves are slaughtered in certain of the dairy counties for shipment to the larger centers of population—consequently these would be shown under slaughter data and not under animals shipped out. On account of the large number of calves of dairy origin, the time of calving has an influence on the time of year at which calves are shipped. The larger number of cows calve in the spring of the year, as shown by the seasonal production in the state.[41] Approximately 50 per cent of the calves were sent out of the counties during March, April, May, and June (1923—49.30 per cent; 1924—50.99 per cent; 1925—48.62 per cent; 1926—56.36 per cent; 1927—42.1 per cent). From the peak month in the spring a gradual decrease takes place until the low point is reached in September. A slight increase in the shipments for October and November clearly shows the effort of fall calving. This is shown in some small degree by the seasonal production in the state.

Shipments of All Cattle into California.—Several classifications are made of cattle shipped into the state and each should be kept clearly in mind by the reader. An attempt will be made to discuss each classification separately.

Data with reference to the number of all cattle shipped into the state are available since 1922 (fig. 26). These shipments include not only cattle destined for immediate slaughter but also feeders, dairy cattle, breeding stock, etc. Regardless of this fact, all cattle coming into the state add to the potential beef supply. While a drop in the number imported occurred in 1923, data since then show an increase. This might have been expected considering the rapid growth of the human population and the stationary position held by the cattle population in California.

The seasonal movement in the shipments of cattle is most pronounced, occurring with a high degree of regularity. The peak month

[41] Voorhies, Edwin C. Economic aspects of the dairy industry. California Agr. Exp. Sta. Bul. 437: 1–192. 1927.

of the year is November, and imports then decline until July, the low month of the year. A rapid increase occurs from August to the peak month. Generally speaking, shipments are heavy during the fall and winter and light during the spring and summer.

CATTLE SHIPPED INTO CALIFORNIA, 1922–1927

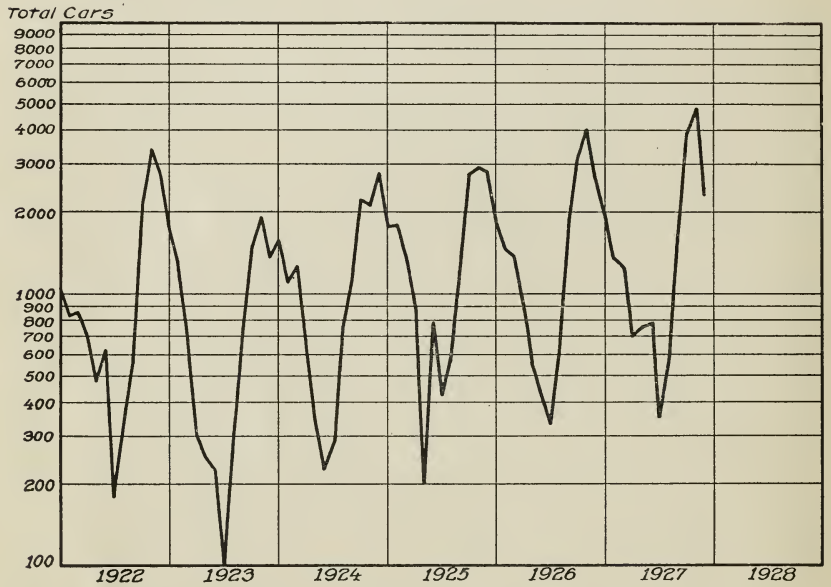


Fig. 26.—Since 1923 there has been a notable increase in the number of cattle shipped into the state. The larger number of feeder cattle shipped in has been largely responsible for this increase, and the seasonal movement of all-cattle shipments is influenced to a considerable degree by feeder shipments.

(Data from table 47.)

Origin of All Cattle Shipped into California.—During the six years 1922–1927, Arizona has been the source of the largest number of cattle shipped into the state. The following are the percentages (medians of percentages for the six-year period 1922–1927) of the importations furnished by the states in which cattle shipments destined for California originated: Arizona 31, Nevada 17, Utah 14, Idaho 8, Oregon 8, New Mexico 6, Texas 6, Colorado 3, and Wyoming 2.

Slaughter Cattle and Calves Shipped into California.—(See page 50 and figs. 12 and 13.)

TABLE 47

All Cattle Shipped into California, 1922–1927

(Cars)

State or country of origin	1922	1923	1924	1925	1926	1927											
						Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Arizona	4,527	2,966	3,532	5,316	6,619	8,810	512	311	186	319	551	500	235	311	485	1,738	2,525	1,137
Canada	.....	.....	43	.....	19	36	.....	.....	.....	.....	.....	.....	.....	.....	.....	17	19	.....
Colorado	1,029	191	527	462	266	433	88	132	80	14	17	8	10	10	45	15	3	11
Idaho	724	734	1,659	1,455	1,632	1,371	161	58	73	27	18	21	25	59	259	247	290	133
Mexico	9	23	68	23	165	238	.....	.....	47	26	38	4	.....	.....	.....	66	57	.....
Montana	275	181	652	335	580	297	61	18	6	15	.....	.....	4	.....	16	60	45	72
Nevada	1,832	2,136	2,667	3,215	3,143	3,192	310	257	290	95	31	88	22	55	460	672	584	328
New Mexico	2,101	724	739	1,140	1,008	959	141	38	31	12	42	21	7	6	11	190	460	.....
Oregon	1,170	1,357	1,305	1,314	1,427	985	71	60	26	27	23	25	16	27	91	339	168	112
Texas	1,358	875	1,013	981	1,169	641	95	39	69	84	5	9	4	47	.....	56	139	94
Utah	832	1,019	1,836	2,779	2,656	2,785	461	411	400	53	9	76	31	47	170	289	436	402
Washington	.....	27	.....	34	52	21	2	1	2	1	2	.....	2	1	4	5	1	.....
Wyoming	417	257	208	422	453	278	23	20	5	16	11	.....	.....	2	35	56	76	34
Other states	172	25	114	65	41	70	2	12	7	1	1	9	6	7	13	3	1	9
Totals	14,446	10,515	14,363	17,541	19,230	20,116	1,927	1,357	1,218	690	748	761	362	572	1,589	3,756	4,804	2,332

Source of data: U. S. Dept. Agr. Bur. Agr. Econ. Carloads of cattle shipped into California with states of origin. Mimeographed reports issued by Bur. Agr. Econ., San Francisco Office.

TABLE 48

Feeder Cattle Shipped into California, 1922–1927

(Cars)

State or country of origin	1922	1923	1924	1925	1926	1927												
						Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Arizona	3,533	3,081	1,964	4,953	5,724	8,187	452	241	131	259	504	483	208	302	445	1,665	2,443	1,054
Colorado	84	103	201	202	214	331	57	94	56	13	17	8	10	10	45	8	3	10
Idaho	502	1,160	1,322	1,106	1,423	992	159	51	46	25	18	21	25	48	152	167	197	83
Montana	156	222	340	262	376	158	31	18	3	5	.....	.....	4	.....	15	52	30	.....
Nevada	1,239	1,072	473	1,094	806	1,332	7	.....	37	.....	15	86	17	38	326	459	271	76
New Mexico	1,911	712	571	1,265	936	930	131	30	31	12	42	21	7	6	6	189	455	.....
Oregon	829	687	632	530	630	427	38	30	18	27	23	25	16	24	8	117	64	37
Texas	611	316	645	547	816	586	79	29	67	78	2	9	4	47	.....	56	139	76
Utah	228	835	690	1,371	1,126	1,824	248	247	315	21	9	76	31	46	88	216	306	221
Washington	4	28	11	40	51	21	2	1	2	1	2	.....	2	1	4	5	1	.....
Wyoming	285	304	255	377	440	174	23	20	45	14	11	.....	.....	1	13	36	22	29
Canada	15	.....	21	.....	19	31	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	19	.....
Mexico	.....	23	54	38	165	238	.....	.....	47	26	38	4	.....	.....	.....	66	57	.....
Total cars*	9,397	8,543	7,179	11,785	12,726	15,231	1,127	761	758	481	681	733	224	523	1,102	3,048	4,007	1,586
Total head	347,689	316,091	265,623	436,045	470,862	563,547	41,699	28,157	28,046	17,797	25,197	27,121	8,288	19,351	40,774	112,776	148,259	58,682

* Does not include shipments from Illinois, Iowa, Kansas, Minnesota, Missouri, Nebraska, Ohio and Oklahoma. Shipments from these states are probably mostly dairy cattle and purebreds and average less than 1 car per month per state.

Source of data: Information supplied authors by the Western Cattle Marketing Association. 1 car=37 head.

Feeder Cattle Shipped into California.—Although over 80 per cent of the cattle slaughtered in California have their immediate origin within the state, a considerable number of these have been bred outside the state, as is shown by the movements of feeder cattle into California. While the shipments of slaughter cattle have shown no definite trend, feeder-cattle shipments have tended to increase

Movement of Feeder Cattle into California, 1922–1927
1 car = 37 head.

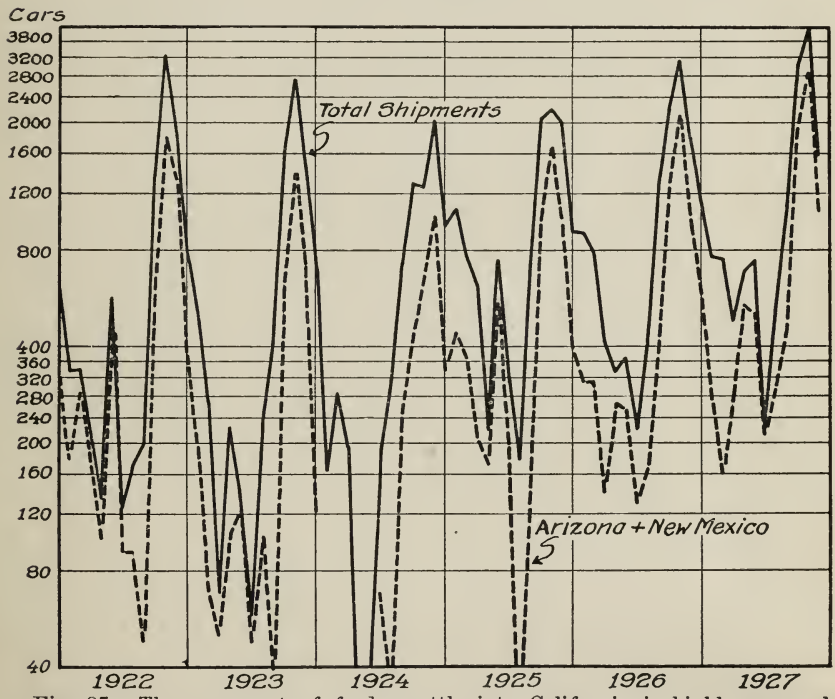


Fig. 27.—The movement of feeder cattle into California is highly seasonal, the larger shipments being made during October, November, and December. Shipments are usually light during the late spring and summer. There has been a notable increase in these shipments during the past few years. Arizona and New Mexico contributed the larger portion of these shipments.
(Data from table 48 and similar data prepared by authors.)

rapidly (fig. 27). These shipments point to an even larger dependence of California on the other western states than might at first be anticipated. Feeder-cattle shipments are highly seasonal, approximately 60 per cent entering the state during October, November, and December. The five months of April to August have been those of small shipments. Considerable variation has occurred in the receipts during the first three months of the year.

During the six years, 1922–1927, the largest number of feeders shipped into this state originated in the eleven western states and Texas with occasional shipments from the middle west, Canada, and Mexico (fig. 27). Arizona has furnished the bulk of the shipments, followed by Idaho, New Mexico, Oregon, Utah, Nevada, and Texas in the order named. These seven states have furnished approximately 90 per cent of the total shipments. Shipments from almost all of the states give evidence of considerable irregularity, brought about to a large extent by feed and climatic conditions. The increase in shipments from Mexico is of interest. With the rehabilitation of the cattle industry of the southern republic (p. 118) it seems reasonable to expect any surplus to seek an outlet in the United States.

TABLE 49

MONTHLY SHIPMENTS OF FEEDER CATTLE INTO CALIFORNIA, 1922–1927

(Carloads)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1922	703	334	341	212	134	566	126	172	200	1,367	3,375	1,867	9,397
1923	792	514	267	69	222	137	59	233	403	1,576	2,712	1,558	8,543
1924	703	165	286	194	20	34	190	312	725	1,282	1,250	2,018	7,179
1925	935	1,070	758	620	221	732	317	178	673	2,041	2,229	2,011	11,785
1926	905	895	780	414	332	369	224	406	1,268	2,244	3,142	1,788	12,727
1927	1,127	761	758	481	681	733	224	523	1,102	3,048	4,007	1,586	15,231

NOTE.—Fractions of cars prevent totals of individual months in every case from equaling total given in table 49.

Source of data: Western Cattle Marketing Association.

Cattle (Exclusive of Calves) Shipped Out of California.—While records of out-of-state shipments are available for five years only, 1923–1927, an analysis of these is of interest. During the four years 1923, 1925, 1926, and 1927, an average of 20,614 head were sent outside of the state. This movement is highly seasonal, approximately 75 per cent moving out during April, May, and June, with by far the heavier shipments occurring during the latter two months. These consist of early grass cattle which can stand long-distance shipping and are moved to the markets of Seattle, North Portland, Ogden, Denver, Salt Lake City, Omaha, Kansas City, and in a few instances to Chicago. In addition to shipments made to the above markets, stockers and feeders are sent to the other western states. Oregon, Washington, Nebraska, Missouri, Utah, and Nevada receive over 90 per cent of the cattle shipped out of the state.

The California grass cattle season of 1927 witnessed a larger movement of grass cattle to markets outside the state than has taken

place during the previous four years.[42] This can be attributed to two main reasons: (1) an active and high cattle market in the United States as compared with previous years, and (2) an exceptional grass-cattle season in California, many steers putting on 100–150 pounds more weight than in previous years owing to excellent grass conditions and plentitude of feed. California cattle growers are also selecting feeders with more caution and furnishing some supplemental feeds such as oat hay, cottonseed cake and ground barley in a limited ration, in addition to grass.

According to records of movement maintained by the Federal and State Market News Service, 1927 was the first year in the past four that any California cattle reached the Chicago market. The common practice in 1927 was to sell weighty California steers at main-line Sacramento and San Joaquin Valley points to eastern cattle buyers or speculators who shipped them generally to the Omaha livestock market. There, on account of scarcity of feeders from other states, feeder buyers made their purchases and re-shipped them to the country. After 45–90 days of further feeding in the Corn Belt they were re-graded along with cattle from other states and shipped on to the Chicago market. Records of 21 cars sold showed that these steers ranged from 1,175 to 1,500 pounds, bringing a range in price from $11.75 to $13.00 per cwt. (weighted average = $12.41).

A few tail ends sold down to $10.85. While the Federal and State Market News Service states that it is probable that some of these animals were not of California origin, it is believed that most of them were. However, local comment in California was that these weighty steers were largely Nevada, Utah, and in some instances Wyoming-bred stock which had been shipped as feeders into California during the fall of 1926 and had become mixed with the California steers.

Shipments of calves out of the state are comparatively unimportant.

Market Outlets for California Cattle.—California fat cattle are subject to a number of marketing outlets, the diversity of which depends upon the time of year, and the situation existing with regard to cattle supplies in the United States.

The two principal market outlets are San Francisco and Los Angeles but in addition to these larger centers of population, there are numerous communities in which local butchers or slaughterers

[42] The information relative to the grass-cattle movement was furnished by W. E. Schneider, Bureau of Agricultural Economics, San Francisco, Calif.

maintain establishments and conduct some form of packer business. This situation, brought about by the large area of the state and the fact that centrally located packers do not carry on so extensive refrigerator car business as in the middle west, gives to California cattle additional outlets uncommon in the more densely populated areas of the United States. The sale of slaughter cattle to "local butchers and packers" constitutes a very considerable part of the total slaughter in the state and is particularly advantageous to small producers having less than carlots of cattle read for market at one time.

It is not uncommon for California cattle to be placed in feed lots at mid-western points where they are subject to intensive feeding. This is particularly true in years when cattle supplies are limited in the corn belt and when a large corn crop is available for feeding purposes. In 1928, a strong feeder demand from the corn belt states relieved the pressure in California. The feed lots of the middle west take the California grass cattle, especially the heavier end, when favorable feeding conditions exist. Cattle considered as ready for the block in California are most in demand for this purpose and shipments eastward usually take place during the summer months.

California grass fat cattle also find a market outlet in the middle west, going to the block without further feeding. Considerable numbers are sent to Ogden and Salt Lake City just as soon as feed lot cattle are cleaned up in Utah. As a rule these cattle are disposed of by the middle of April. From this time until the middle of June the California cattle are received rather regularly. Northern shipments out of the state to Oregon and Washington for slaughter purposes are common too, during the grass cattle season.

Available markets during the period of heaviest production or turn-off (summer months) play an important part in the stability of Pacific Coast price levels. The need for additional marketing opportunities is becoming increasingly evident by reason of the fact that importations of feeder cattle are placed on grass in California each year and these are so located that the great majority become ready for market at about the same time. seasonal distribution of cattle for market is, therefore, an important problem of the California cattleman. Evidence of its recognition is seen in the cooperative marketing movement instituted in 1923 which is now an important factor in regulating and distributing seasonable supplies.

TABLE 50

CATTLE (EXCLUSIVE OF CALVES) SHIPPED OUT OF CALIFORNIA, 1923–1927

(Number of head.)

Destination	1923	1924	1925	1926	1927											
					Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Arizona	575	616	1,456	192	279	14	.....	.....	84	.....	19	.....	23	.....	.....	92	47
Missouri	1,349	.....	2,131	.....	483	.....	.....	.....	.....	97	386	.....	.....	.....	.....	.....	.....
Nebraska	1,788	.....	1,144	424	5,617	.....	.....	104	61	661	2,782	629	1,380	.....	.....	.....	.....
Nevada	4,760	7,170	4,330	2,938	1,531	54	81	133	58	223	325	281	56	168	125	27	.....
Oregon	4,423	749	4,536	4,244	10,350	.....	210	.....	1,020	6,328	1,857	935	.....	.....	.....	.....	.....
Utah	226	.....	2,413	80	1,767	.....	.....	.....	129	488	1,150	.....	.....	.....	.....	.....	.....
Washington	7,391	.....	2,980	1,925	5,367	.....	.....	.....	116	2,961	1,865	425	.....	.....	.....	.....	.....
Other states	3,685	.....	2,613	326	1,133	14	.....	.....	196	.....	59	161	575	.....	.....	128	.....
Total	24,197	8,535	21,603	10,129	26,527	82	291	237	1,664	10,758	8,443	2,431	2,034	168	125	247	47

Source of data: Computations by authors from monthly reports issued by the Cattle Protection Service, Cal. State Dept. Agr.

Freight Rates.—With the surplus cattle population and the long distances from markets in the mountain states, transportation costs are of vital importance. For a large portion of this area at the present time freight rates to the Pacific Coast are lower than those to the middle-western markets. The dividing line of equal freight rates to San Francisco and Los Angeles on one hand and to Kansas City and Omaha on the other is shown in figure 2, page 12. While the California producer has a distinct advantage in his own market, the distance to middle western markets is such that considerable expense is involved in sending any seasonal surplus to them.

FOREIGN TRADE IN BEEF AND BEEF CATTLE

The Share of the Pacific Coast in Foreign Trade.—The Pacific Coast is of little significance in the beef export trade. Puget Sound has exported a larger aggregate tonnage of beef than any of the other western ports, although movements from all of the customs districts have been erratic.

TABLE 51

EXPORTS OF BEEF FROM THE CUSTOMS DISTRICTS OF THE PACIFIC COAST, 1910–1927*

(Thousand pounds, i.e., 000 omitted.)

Fiscal years	San Francisco	Southern California**	Oregon	Washington
1910	291	3	85	588
1911	178	3	.....	273
1912	1,122	27	.....	405
1913	245	.....	.....	295
1914	98	.....	.....	102
1915	574	6	.....	101
1916	183	9	.....	186
1917	590	8	.....	1,618
1918	205	17	.....	646
Calendar years				
1918	75	13	.....	64
1919	316	39	.....	200
1920	607	123	.....	1,248
1921	265	5	.....	190
1922	157	6	.....	88
1923	170	82	.....	178
1924	148	58	.....	41
1925	261	186	.....	45
1926	148	86	.....	36
1927	113	124	.....	123

* Excluding Alaska. ** Includes San Diego and Los Angeles Districts.

Sources of data: 1910–1926, U. S. Dept. Commerce, Commerce and Navigation of the U. S. 1910–1926. 1927 information to authors from Dept. Commerce.

NOTE.—U. S. Dept. of Commerce quotes beef, fresh; veal, fresh; beef and veal, pickled and cured; and beef, canned. The above are the summations of the four classifications for each district.

Excess Imports and Exports of Cattle (Converted to Beef Equivalents), United States, 1904–1927

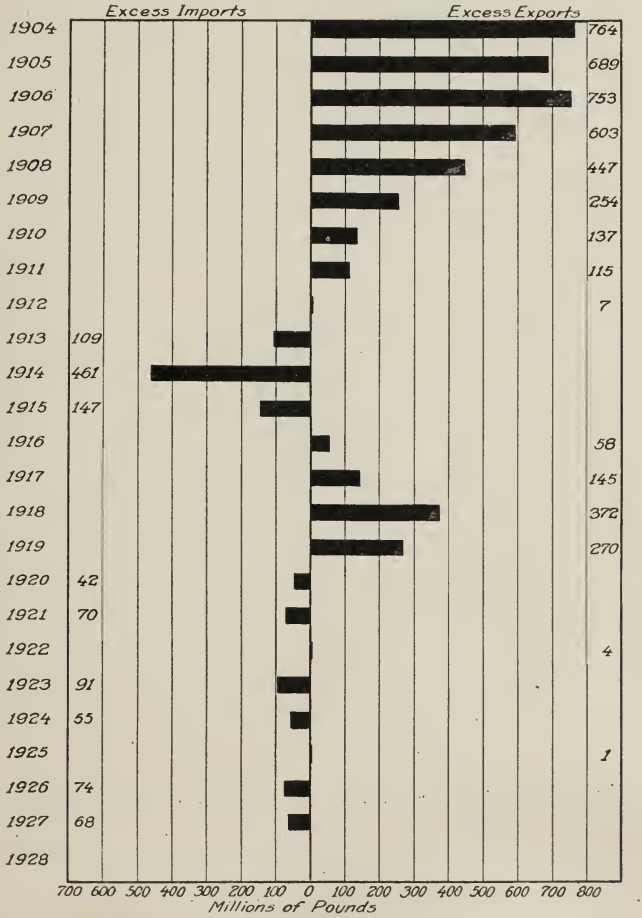


Fig. 28.—Since 1912, with the exception of 1922, the United States has imported a larger number of cattle than have been exported. Many of these animals have been feeder cattle imported from Canada and Mexico. It is likely that excess of imports will continue.

(Data from table 52.)

San Francisco has been the largest export district for California (table 52), but of late there has been some slight tendency for the southern California district to claim a larger share. The two districts show decided differences in the products shipped out, San Francisco exports being largely canned goods, while Los Angeles exports consist mainly of fresh beef. The latter exports are for the navy trade, practically none being sent to foreign markets for consumption, while the former represent eastern canned goods, since meat canning is not carried on to an appreciable extent on the Pacific Coast. The Puget Sound offerings have been largely in fresh beef.

Unfortunately, import statistics through Pacific Coast customs districts have been combined under the designation "Meats" and an analysis of these data does not give results which can be used in this publication.

Live-Cattle Exports.—Exports of live cattle from the United States have always been predominantly for slaughter. From the close of the Civil War until 1904 exports increased in volume, the peak of shipments being reached in the latter year with exports of 593,409 head (table 53). Approximately 65 per cent of these exports went to the United Kingdom. From 1906 on, there was a rapid decline, until at the beginning of the World War exports had virtually ceased. Live-animal exports were rapidly replaced by chilled and frozen beef shipped chiefly from Argentina and Australasia. Since the War there have been considerable shipments into Mexico, Cuba, and the West Indies. Exports of dairy-bred animals into Canada and purebred beef animals into South America, together with shipments into Mexico for purposes of restocking, have formed an appreciable item in the relatively small exports of recent years.

Live-Cattle Imports.—With the exception of purebred stock brought chiefly from Great Britain for breeding purposes, it has been impracticable to import live cattle except from Canada and Mexico. Until 1915 the bulk of these animals, predominantly stockers and feeders, were received from the latter country. Over 80 per cent of the imports of live cattle since the close of the World War, however, originated in Canada. (See p. 118.) With the restocking of Mexican ranches an increase in live-cattle exports from the south may be expected.

United States Balance of Trade in Cattle and Beef, 1904–1927

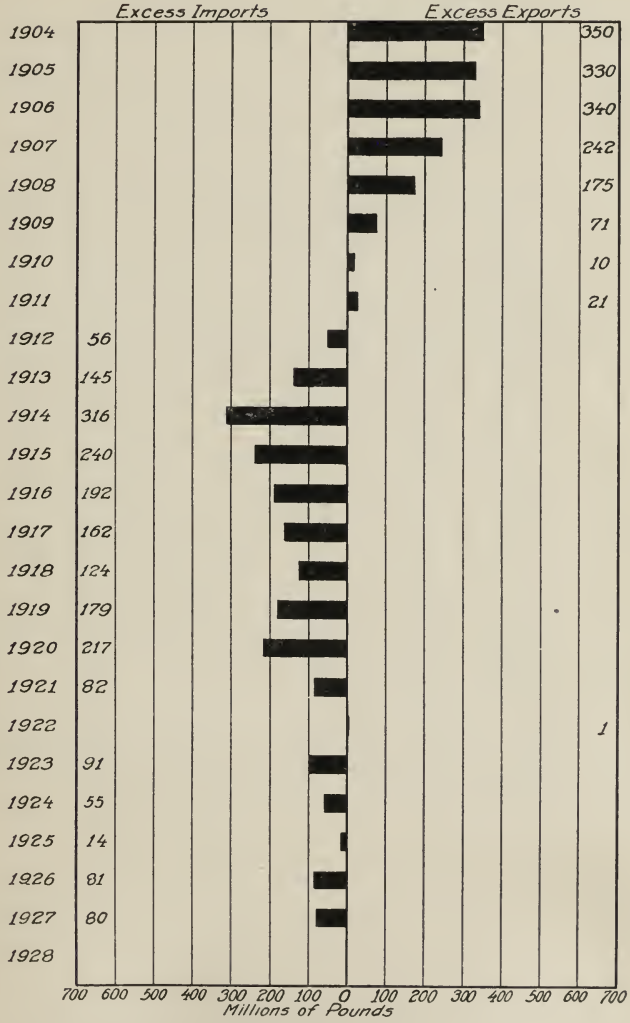


Fig. 29.—In the above figure cattle are converted to beef equivalents. From 1906 to 1912 there was a rapid decline in exports followed by a period of increasing imports. Exports exceeded imports temporarily during the World War. Since 1920 the United States has tended to import rather than export beef.

(Data from table 53.)

TABLE 52

GENERAL IMPORTS AND DOMESTIC EXPORTS OF LIVE CATTLE, UNITED STATES, 1885–1927

(Head of cattle; thousands, i.e., 000 omitted.)

Fiscal year	General imports	Domestic exports	Fiscal year	General imports	Domestic exports	Fiscal year	General imports	Domestic exports
1885	105	136	1900	181	397	1915	538	5
1886	78	119	1901	146	459	1916	439	21
1887	87	106	1902	96	393	1917	375	13
1888	64	140	1903	66	402	1918	294	18
1889	62	206	1904	16	593	1919	440	42
1890	31	395	1905	28	568	1920	575	83
1891	12	375	1906	29	584	1921	330	146
1892	2	395	1907	32	423	1922	152	155
1893	3	287	1908	92	349	1923	252	61
1894	2	359	1909	139	208	1924	155	33
1895	150	332	1910	196	139	1925	136	106
1896	218	372	1911	183	150	1926	215	36
1897	329	392	1912	318	106	1927	267	21
1898	292	439	1913	422	25			
1899	200	389	1914	868	18			

Sources of data: 1885–1925, U. S. Dept. Agr. Bur. Agr. Econ. Statistics of cattle, calves, beef, veal, hides and skins. U. S. Dept. Agr. Stat. Bul. **20**: 106, 107. 1927. 1926–1927, U. S. Dept. Commerce, Monthly Summary of Foreign Commerce of the United States, Pt. **2**: 118, 130. 1927.

TABLE 53

United States Balance of Trade in Cattle and Beef, 1900–1927

(Thousand pounds, i.e., 000 omitted.)

Year	Excess of cattle		Excess of cattle and beef	
	Imports	Exports	Imports	Exports
1900		172,657		606,579
1901		221,166		681,653
1902		197,853		615,482
1903		216,471		601,146
1904		350,010		764,714
1905		330,442		689,415
1906		339,929		753,492
1907		242,037		602,733
1908		174,936		447,039
1909		71,977		254,414
1910		10,071		136,774
1911		21,444		114,681
1912	55,978			7,380
1913	144,602		108,771	
1914	316,009		461,271	
1915	240,244		147,205	
1916	191,639			57,601
1917	162,135			145,411
1918	124,197			371,947
1919	179,170			269,891
1920	217,030		42,355	
1921	82,800		69,574	
1922		1,350		4,137
1923	91,350		91,350	
1924	55,350		55,350	
1925	14,200			909
1926	80,550		74,279	
1927	79,620		67,775	

Note.—Imports of live cattle are converted into terms of beef they represent as follows: 1900–1914, 375 pounds per head; 1915–1927, 450 pounds per head.

Exports of live cattle are converted into terms of beef they represent as follows: 1900–1914, 600 pounds per head; 1915–1927, 450 pounds per head.

Sources of data: 1900–1924, U. S. Tariff Commission. The cattle industries of the United States and Canada, 1–51. Government Printing Office, Washington, D. C., 1925. 1925–1927, computations by authors from current statistics in Department of Commerce, Monthly Reports of Foreign Commerce of the United States.

TABLE 54

Beef and Veal Imported by the United States, with Origin, 1910–1927

(Thousand pounds, i.e., 000 omitted.)

Year	From Canada		From Argentina		From Uruguay		From Australia		From New Zealand		From other countries		Total
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number
Fiscal year ending June 30													
1910													948
1911													381
1912													1,023
1913													4,229
1914	15,920	8.84	59,775	33.18	25,903	14.38	19,858	11.03	859	0.48	57,822	32.09	180,137
1915	15,305	8.30	130,680	70.83	13,802	7.48	10,482	5.68	1,602	0.87	12,620	6.84	184,491
1916	9,918	13.93	52,680	74.08	192	0.26			5	0.06	8,307	11.67	71,102
1917	9,436	62.00	2,296	15.08	87	0.58	201	1.33	13	0.09	3,184	20.92	15,217
1918	20,768	81.59	431	1.69	13	0.06	569	2.24			3,671	14.42	25,452
Calendar years													
1918	14,910	63.88	2,621	11.23	16	0.07	269	1.16			5,523	23.66	23,339
1919	31,124	80.92	261	0.68	94	0.25	1,528	3.97	†		5,455	14.18	38,462
1920	37,488	74.70	2,428	4.83	1,090	2.18	2,444	4.88	2,943	5.86	3,789	7.55	50,182
1921	26,469	81.74	1,051	3.25	456	1.41	1,193	3.69	2,969	9.16	240	0.75	32,378
1922	19,625	53.48	11,103	30.25	2,190	5.96	1,530	4.18	1,803	4.92	443	1.21	36,694
1923	13,800	71.29	1,501	7.75	131	0.68	1,394	7.21	2,500	12.91	30	0.16	19,356
1924	9,575	52.88	3,765	20.79	405	2.24	349	1.93	3,987	22.02	23	0.14	18,104
1925	11,041	69.57	322	2.03	136	0.85	2,060	12.98	2,299	14.49	12	0.08	15,870
1926	13,924	69.25	1,488	7.40	209	1.04	2,997	14.91	1,447	7.20	41	0.20	20,106
1927	37,780	88.74					2,254	5.29	738	1.73	3		42,574

† Less than 500 pounds.

Note.—Years 1910–1913, imports include "beef and veal." 1914–1927, imports include (1) fresh beef, (2) fresh veal, (3) beef and veal, pickled and cured, (4) beef, canned.

Sources of data: 1910, U. S. Dept. Commerce, Foreign Commerce and Navigation. **1910**: 1051; 1911. 1911, ibid **1911**: 991; 1912. 1912, ibid **1912**: 1060; 1913. 1913, ibid. **1913**: 810; 1914. 1914–1924, Wrenn, J. C. International trade in meats and animal fats, U. S. Dept. Commerce, Trade Promotion Series **26**: 161; 1925. 1925, U. S. Dept. Commerce. Foreign Commerce and Navigation **1925** (1): 191; 1926. 1926, ibid. **1926** (1): 186; 1927. 1927, U. S. Dept. Agr. Bur. Agr. Econ. Cattle and beef. Foreign Crops and Markets **17** (6): 225; 1928.

TABLE 55

BEEF AND VEAL EXPORTED FROM THE UNITED STATES,* WITH DESTINATION, 1910–1927

(Thousand pounds, i.e., 000 omitted.)

Year	To Canada		To Newfoundland and Labrador		To Panama		To rest of North America		To South America		To Great Britain		To other Europe		To Asia		To Oceania		To Africa		Total exports
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number
Fiscal year ending June 30																					
1910	1,677	1.32	5,203	4.09	6,166	4.80	6,184	4.85	3,448	2.71	90,542	71.06	10,765	8.44	1,015	0.80	130	0.11	2,316	1.82	127,406
1911	2,107	2.26	5,943	6.34	5,688	6.07	8,132	8.68	4,717	5.04	53,802	57.46	10,853	11.59	450	0.49	117	0.13	1,810	1.94	93,619
1912	2,461	3.83	5,325	8.27	6,729	10.45	7,823	12.15	4,015	6.24	23,355	36.27	11,594	18.00	1,454	2.26	165	0.26	1,458	2.27	64,379
1913	1,464	3.66	3,853	9.61	7,180	17.92	6,726	16.78	3,329	8.32	9,169	22.88	7,161	17.87	401	1.01	53	0.14	724	1.81	40,060
1914	1,648	4.98	4,975	15.01	6,547	19.76	6,084	18.36	3,501	10.56	5,300	16.00	4,211	12.71	141	0.43	20	0.08	698	2.11	33,125
1915	2,277	0.83	4,427	1.59	4,472	1.61	5,157	1.85	2,806	1.01	130,161	46.89	126,961	45.74	329	0.12	39	0.02	1,930	0.34	277,559
1916	8,329	2.60	5,208	1.62	2,076	0.65	5,162	1.62	2,632	0.82	167,592	52.35	117,206	36.61	438	0.14	20	0.01	11,469	3.58	320,132
1917	34,737	10.76	7,228	2.23	648	0.21	5,193	1.60	2,486	0.78	173,395	53.72	97,799	30.30	658	0.21	14	.....	611	0.19	322,767
1918	41,091	7.87	6,095	1.16	263	0.06	3,860	0.74	1,896	0.37	336,370	64.45	131,503	25.19	391	0.08	39	0.01	336	0.07	521,844
Calendar year																					
1918	13,240	1.89	5,899	0.84	416	0.06	3,532	0.51	1,592	0.23	500,347	71.47	174,462	24.92	223	0.04	14	†	280	0.04	700,005
1919	4,347	1.61	6,063	2.23	107	0.04	3,536	1.30	1,644	0.61	72,590	34.15	162,107	59.79	352	0.14	7	†	346	0.13	271,099
1920	4,705	3.38	5,799	4.17	294	0.21	7,190	5.17	2,783	2.00	11,706	8.42	104,591	75.15	1,026	0.73	22	0.01	1,070	0.76	139,186
1921	1,845	4.50	6,461	15.76	598	1.45	7,368	17.97	2,478	6.04	8,765	21.38	12,757	31.11	331	0.80	4	0.01	402	0.98	41,009
1922	1,764	5.40	7,193	22.02	423	1.29	8,916	27.29	2,931	8.97	5,379	16.47	4,847	14.83	485	1.48	9	0.03	725	2.22	32,672
1923	1,432	5.08	7,256	25.77	540	1.91	7,933	28.18	2,970	10.55	3,858	13.70	2,774	9.86	410	1.45	3	0.01	985	3.49	28,161
1924	1,002	3.84	8,011	30.76	367	1.40	7,661	29.40	2,732	10.49	2,328	8.94	2,387	9.17	189	0.72	5	0.02	1,369	5.25	26,051
1925	828	3.13	6,827	25.81	348	1.32	8,048	30.42	2,797	10.57	3,391	12.82	2,694	10.18	260	0.98	6	0.02	1,256	4.75	26,455
1926	744	3.00	7,578	30.61	248	1.00	6,983	28.21	2,187	8.83	3,429	13.85	2,513	10.13	177	0.71	13	0.05	890	3.59	24,771
1927	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19,358

* Includes beef, fresh; veal, fresh; beef and veal, pickled and cured; beef, canned. † Less than 0.005.

Sources of data: 1910–1924. Wren, J. E. International trade in meats and animal fats. U. S. Dept. Commerce. Trade Promotion Series **26**: 150–151; 1925. 1925–1926. U. S. Dept. Commerce, Statistical Abstract of the U. S. **1926**: 476; 1927.

Exports of Beef.—Owing to the numerous products of beef cattle, such as canned, cured, and fresh beef, oleo oil, oleo stock, oleomargarine, tallow, and stearin, which are often placed in various classifications, it is desirable to use comparable data for series of either imports or exports. In tables 54 and 55 beef and veal include (1) fresh beef, (2) fresh veal, (3) pickled and cured beef and veal, and (4) canned beef.

The first shipments of frozen beef sent to England did not meet with popular approval and only with the advent of refrigeration facilities on steamers did this trade begin to assume large proportions. During the last quarter of the nineteenth century the beef exports from the United States increased rapidly. A peak was reached in 1901 when the exports of beef and veal reached a total of 461,296,000 pounds. From 1901 until the outbreak of the War this trade dwindled until during the fiscal years 1913 and 1914 the average amounted to only 36,500,000 pounds. During this period the proportion of fresh beef and veal declined. Over 90 per cent of the exports went to the United Kingdom, a market which was readily supplied by the rapidly expanding surplus of South America and Australasia. During the War, American exports of fresh and prepared beef again became of importance in the European supply. A new record of 521,844,000 pounds of beef exports was set during the fiscal year ending June 30, 1918. Fresh beef again assumed a relatively more important place in exports. European demand broke abruptly in 1919 and 1920 and since 1921 exports have been small. These exports have been sent largely to Newfoundland, Labrador, and to the remainder of North America (exclusive of Canada). The smaller and somewhat specialized trade in canned, pickled, and other cured beef has been better maintained than that in fresh beef.

Imports of Beef and Veal.—On account of the comparatively limited segregation of beef imports it is impossible to accurately gauge anything but the imports of fresh beef and veal. Prior to 1912 imports into the United States were insignificant. Increased production in South America and more or less temporary shortages in the United States made for large imports during 1913, 1914, and 1915 (see table 54), Argentine, Uruguay, Australia, and Canada supplying the bulk of the imports. After the War, imports again increased, but they have not assumed large proportions. An increase of 30 per cent over the corresponding 1927 period is shown in the total imports of beef and veal into the United States for the period January-May, 1928. The heavy increase is due entirely to the result of increased imports

from New Zealand, encouraged by the unusually favorable market for beef prevailing in the United States during the past year. Since 1918 Canada has been the source of over 50 per cent of the imports. Disease conditions in some of the larger exporting countries have been such that importations from them to this country have been prohibited.

Exports and Imports of Beef Fats.—Exports of beef fats, i.e., tallow and its derivatives, oleo oil and oleo stearin, have been more important from the standpoint of both quantity and value since the war. Shipments of these products declined steadily during the period 1910–1919. During 1919, a marked increase in exports took place and since then beef fats have averaged about 135,000,000 pounds a year with a mean value of $15,000,000.

The Balance of Trade in Cattle and Beef.—In attempting to make calculations of total imports and exports (table 53) the authors have used the methods employed by the United States Tariff Commission. No account is taken in these calculations of animal fats, and in addition, the lack of segregation of certain imports, undoubtedly makes for errors. Prior to 1907 the United States practically dominated the export trade in beef and cattle (figs. 28 and 29). During the next five years these exports virtually disappeared and from 1913 to 1915 inclusive, a balance appeared in favor of imports. Under the stimulus of war-time prices and overseas demand, the production and export of beef and cattle increased sharply. With the cessation of foreign demand and a realignment of prices came an import balance in 1920 and 1921. During 1922 imports and exports were almost evenly balanced. Since 1923 there has been a slight excess of imports. With a more complete segregation of imports the import balance in table 53 would be slightly larger.

THE INTERNATIONAL TRADE IN BEEF AND BEEF PRODUCTS

The types of beef and beef products originating in different countries and the demands for them are somewhat dissimilar. Under the term beef and beef products is included, in addition to fresh, chilled, and frozen meat, such by-products as oleo oil and tallow. A segregation such as has been used in the discussion of imports and exports of the United States is difficult if not impossible to use in the discussion of the international trade.

Argentina is the dominant factor in the world trade in beef and beef products, furnishing between 50 and 65 per cent of all such

exports. Uruguay ranks next to Argentina, contributing about 10 per cent of the total exports. Australia, New Zealand, Brazil, the Netherlands, and the United States make considerable contributions to the export trade.

On the import side, the demands of Great Britain absorb over 60 per cent of the surplus of the world, while Germany and France combined take an additional 20 per cent. Outside of the countries of western Europe, Japan and Cuba are the only important importing nations. Imports into the former country have increased rapidly. In 1926 these amounted to 74,694,000 pounds against an average of 9,002,000 for the period 1911–1913. Generally speaking, the world trade in beef and its products was approximately 50 per cent larger in 1925 and 1926 than it was during the three years 1911–1913.

TABLE 56

ESTIMATED NUMBER OF CATTLE IN THE WORLD, 1909–1913 AND 1921–1925
(Thousands)

Division	Average number		Per cent increase or decrease
	1909–1913	1921–1925	
North and Central America and West Indies	76,000	86,000	+13.2
South America	80,000	102,000	+27.5
Europe	133,000	132,000	− 0.8
Africa	27,000	46,000	+70.4
Asia	210,000	245,000	+16.7
Oceania	14,000	17,000	+21.4
The World	541,000	628,000	+16.1

Source of data: U. S. Dept. Agr. Bur. Agr. Econ. The world situation in cattle and beef. Foreign Crops and Markets **15** (7): 219. 1927.

THE FOREIGN SITUATION IN CATTLE AND BEEF

Estimates made of the average number of cattle in the world during 1921–1925 total 628,000,000, an increase of 16.1 per cent over the average for the pre-war years 1909–1913. Numbers increased most rapidly in Africa (70.4 per cent increase), South America (27.5 per cent increase), and Oceania (21.4 per cent increase). Numbers in Asia kept pace with the general increase. Cattle in North America, Central America, and the West Indies increased about 13 per cent. Europe actually reported a loss, which amounted to less than 1 per cent. It is highly probable, however, that the cattle population of Europe on January 1, 1928, was equal to that recorded in the pre-

war years. Indications (table 57) point to a reduction in numbers in 1926 compared with 1924. Relatively low prices prevailed on world markets during 1926, and from the evidence on hand the world supply of beef and veal was apparently smaller in 1927 than in 1926. The direction of cattle and beef price movements in all of the world's important markets has been upward generally since the middle of 1927, with the trend particularly marked since January, 1928.

With the prohibition of imports from many of the surplus-producing countries of the world on account of the disease situation, and with the ability of this country to apparently supply its own demands, conditions abroad may at first appear to have but little influence on the cattle industry in the United States. However, the world situation does have an influence on Canada, and the stronger the European market the less likelihood there is of imports into the United States. This may be the case in the future with Mexico also. An increase or decrease in offerings from Argentina, economic conditions in Europe, etc., exert influences which are felt in some measure in this country.

Brief statements with reference to various continental areas and to the more important countries in those sections should prove to be of interest and of value to the cattlemen.

North and Central America and West Indies.—While the 1921–1925 data point to an increase of some 13 per cent in numbers of cattle over the pre-war period, 1909–1914, there has been somewhat of a decrease during the past three years. Decreases in the United States have been offset to some extent by increases in Mexico and Cuba. The Canadian cattle population has decreased less than that of the United States since 1921.

The economic status of the cattle industry in *Canada* is of primary interest to the cattlemen of the United States. Indirectly, however, conditions in the Argentine meat trade with Great Britain influence the amount of Canadian beef seeking an American market. While the Canadian cattle population is small compared with that of the United States, the northern country has a surplus of beef. There has been some decrease in the number of cattle since 1921, but this decrease has not been so great as that in the United States. On the other hand, the number of cattle in Canada during the post-war years has been approximately 50 per cent greater than in the pre-war years.

The total exports of cattle (exclusive of calves) have been slightly larger since the war than during the pre-war years. The number entering the United States dropped materially until 1925. No distinct trend is shown in the exports of calves, although an unward movement

was apparent during the four years 1922-1926. Compared with pre-war years, exports of fresh beef from Canada since the war have been large. The cattle industry received considerable stimulus during the war, and while supplies have decreased somewhat, the surplus has been far greater during the past few years than it was in the pre-war period.

TABLE 57
NUMBER OF CATTLE

Country	Number of head (in thousands)					Increase (+) or decrease (−) in 1926 compared with		
	1913	1919	1924	1926	1927	1913	1919	1924
Belgium	1,849	1,286	1,628	1,712	1,739	− 7.4	+ 33.1	+ 5.2
Czechoslovakia*†	4,596‖	4,377§		4,691		+ 2.1	+ 7.2	
Denmark	2,254‡	2,188	2,667	2,840	2,912	+ 26.0	+ 29.8	+ 6.5
Esthonia	478‖	420§	502	599	634	+ 25.3	+ 42.6	+ 19 3
Finland*	1,606‖	1,825	1,865	1,871		+ 16.5	+ 2.5	+ .3
France	15,338	12,789	13,749	14,282	14,941	− 6.3	+ 12.4	+ 3.9
Germany	18,474	16,524	17,326	17,195	17,983	− 6.9	+ 4.1	− .8
Gr. Britain and N. Ireland	7,726	8,242	7,794	8,115	8,176	+ 5.0	− 1.5	+ 4.1
Hungary	2,150¶	2,148§	1,887	1,839	1,805	− 14.5	− 14.4	− 2.5
Irish Free State	4,134	4,249	4,268	3,947		− 4.5	− 7.1	− 7.5
Latvia*	912	768§	911	916	955	+ .4	+ 19.3	+ .5
Lithuania	918	865§	1,285	1,396		+ 45.9	+ 54.8	+ 8.6
Luxemburg*†	102‖	89		101		− 1.0	+ 13.5	
Norway	1,134	1,050[1]	1,114	1,200	1,209	+ 5.8	+ 14.3	+ 7.7
Roumania*†		4,730§	5,399	4.798	4,992		+ 1.4	− 11.1
Soviet Russia† (Europe and Asia)	60,300[2]		55,900	63,000		+ 4.5		+ 12.7
Spain	2,879	3,397	3,435	3,436	3,688	+ 19.3	+ 1.1	
Yugoslavia*†		4,834[3]	3,870	3,768			− 22.1	− 2.6
Europe totals	59,852	55,751	58,431	59,348		− .8	+ 6.5	+ 1.6
Canada	6,656	10,085	9,461	8,751	9,172	+ 37.6	− 9.2	− 3.2
Costa Rica*†	333‖		426	433		+ 30.0		+ 1.6
United States	55,833	70,261	64,507	59,148	57,521	+ 3.0	− 18.1	− 7.2
Mexico*†		2,163§	2,363	5,585			+158.2	+136.4
Jamaica*	116	170	112	133		+ 14.7	− 21.8	+ 18.7
North and Central American totals	62,605	80,516	74,080	68,441		+ 9.3	− 15.0	− 7.6
Chile*†	2,084	2,163		1,918		− 8.0	− 11.0	
British Guiana*†	81	79	102	135		+ 66.7	+ 70.9	+ 32.4
South America								
Formosa	138	113	100	92		− 33.3	− 18.6	− 8.0
India:								
British Provinces*	112,000	117,559§	117,250	119,492		+ 6.7	+ 1.5	+ 1.9
Dutch East Indies:								
Java and Madura*	3,243[4]	3,016	3,253	3,493		+ 7.7	+ 15.8	+ 7.4
Other Provinces*	712[4]	780	877	850		+ 19.4	+ 9.0	− 3.1
Siam*	2,360	2,542	2,972	3,872		+ 64.1	+ 52.3	+ 30.3
Asia totals	118,453	124,010	124,452	127,769		+ 7.9	+ 3.1	+ 2.7
Algeria*	1,108	1,093	794	892	849	− 19.5	− 18.4	+ 12.3
Basutoland*	437	581[2]	603	631		+ 44.4	+ 8.6	+ 4.6
Belgian Congo*	500	500	510	480		− 4.0	− 4.0	− 5.9
Gold Coast*	50	76	84	85		+ 70.0	+ 11.8	+ 1.2
Egypt	637	505	689	722		+ 13.3	+ 43.0	+ 4.8

TABLE 57—(*Continued*)

Country	Number of head (in thousands)					Increase (+) or decrease (−) in 1926 compared with		
	1913	1919	1924	1926	1927	1913	1919	1924
Kenya*† (of natives)	.....	2,372§	3,000	3,200	.....	.....	+ 34.9	+ 6.7
(of Europeans)	.....	138	190	217	.....	.....	+ 57.2	+ 14.2
French Morocco*	675[4]	1,322	1,683	1,955	.....	+189.6	+ 47.9	+ 16.2
Nigeria*†	.....	2,394§	2,751	2,864	.....	.....	+ 19.6	+ 4.1
Uganda*	739	575	1,227	1,342	.....	+ 81.6	+133.4	+ 9.4
South West Africa Prot.*	206	450§	550	572	.....	+179.0	+ 27.1	+ 4.0
South Rhodesia*	695	1,331	1,921	2,102	2,189	+202.3	+ 57.9	+ 9.4
Tanganyika*	2,700	3,147[3]	3,800	4,472	.....	+ 65.6	+ 32.1	+ 17.7
Tunis*	217	254[1]	400	308	.....	+ 41.9	+ 21.3	− 23.0
Union of South Africa*	5,797¶	6,852[1]	9,315	9,738	.....	+ 68.0	+ 42.0	+ 4.5
Africa totals	13,761	16,626	21,576	23,299	.....	+ 69.3	+ 40.1	+ 8.0
Australia:								
New South Wales*	2,823	3,281	3,251	2,876	.....	+ 1.9	− 12.3	− 11.5
Other states and northern territory*	8,661	9,618	10,419	10,343	.....	+ 19.4	+ 7.5	− 0.7
New Zealand	2,020¶	3,035	3,563	3,452	3,242	+ 70.9	+ 13.7	− 3.1
Oceania totals	13,504	15,934	17,233	16,671	.....	+ 23.5	+ 4.6	− 3.3
General totals	268,175	292,837	295,772	295,528	.....	+ 10.2	+ .9	− 0.1

NOTES.—* For those countries marked thus 1925 and 1923 were taken instead of 1926 and 1924.

† The countries marked thus are not included in the totals—‡ 1909, § 1920, ‖ 1910, ¶ 1911, [1] 1918, [2] 1921, [3] 1916, [4] 1915.

Sources of data: International Institute of Agriculture, Number of cattle. International Review of Agriculture **1927** (3): 68. 1927. U. S. Dept. Agr. Bur. Agr. Econ. Cattle and beef. Foreign Crops and Markets **15** (7): 219–221. 1927.

TABLE 58

CATTLE IN CANADA, 1910–1927

(Thousands)

Year	Total cattle	Milk cows	Other cattle	Year	Total cattle	Milk cows	Other cattle
1910	7,115	2,854	4,261	1919	10,085	3,548	6,537
1911	6,526	2,595	3,931	1920	9,572	3,505	6,068
1912	6,432	2,604	3,827	1921	10,207	3,738	6,469
1913	6,656	2,740	3,916	1922	9,720	3,746	5,974
1914	6,037	2,673	3,364	1923	9,246	3,737	5,509
1915	6,066	2,667	3,399	1924	9,461	3,727	5,734
1916	6,594	2,833	3,761	1925	9,307	3,830	5,477
1917	7,921	3,202	4,719	1926	8,751		
1918	10,046	3,539	6,507	1927	9,172		

Sources of data: 1910–1916, Dominion Bur. of Statistics. Canada Yearbook **1918**: 41. 1919. 1917–1922, ibid. **1922-23**: 263. 1924. 1923–1925, U. S. Dept. Agr. Bur. Agr. Econ. Cattle and beef. Foreign Crops and Markets **15** (7): 222, 239. 1927. 1926–1927, U. S. Dept. Agr. Bur. Agr. Econ. Cattle and beef. Foreign Crops and Markets **17** (6): 209, 1928.

Large sections of *Mexico,* especially the interior plateaus and southern mountain valleys, possess climatic and other conditions that are favorable to the raising of livestock. The United States is the principal market for Mexican cattle, which are primarily stockers and feeders. From 1906 to 1914 there was a steady increase in the number sent to the United States, over 625,000 head being sent during the latter year. Exports to the United States fell rapidly during and after the world war period. On account of the disturbed state of the country the cattle population of Mexico was at a low point in 1920.

TABLE 59

EXPORTS OF CATTLE AND CALVES FROM CANADA, 1913–1927

Year	Cattle			Calves		
	Total	To Great Britain	To United States	Total	To Great Britain	To United States
1913	193,714	9,878	189,383	22,581	.....	22,486
1914	147,945	.....	145,722	31,974	.....	31,939
1915	193,352	1,752	179,016	55,903	.....	55,860
1916	106,278	.....	104,227	60,343	.....	60,310
1917	150,044	.....	148,077	47,123	.....	47,014
1918	203,481	.....	200,666	36,703	.....	36,594
1919	467,642	159	453,606	78,848	.....	78,703
1920	240,660	320	236,642	74,519	.....	74,428
1921	174,552	33,053	135,257	57,695	.....	57,623
1922	212,772	18,475	189,760	27,955	.....	27,720
1923	160,771	57,672	96,873	24,219	.....	24,074
1924	183,242	79,435	97,847	35,359	.....	35,178
1925	204,378	110,868	86,748	62,814	.....	62,313
1926	176,343	79,985	92,962	65,625	.....	65,313
1927	216,209	8,263	204,336	79,065	.....	78,668

Sources of data: 1913–1924, U. S. Tariff Commission. The cattle industries of the United States and Canada. Spec. Pub. *p. 14.* 1925. 1925–1926, U. S. Dept. Agr., Bur. Agr. Econ. Cattle and beef, Foreign Crops and Markets **15** (7): 235, 1927. 1927, U. S. Dept. Agr. Bur. Agr. Econ. Cattle and beef. Foreign Crops and Markets **17** (6): 226, 1928.

Considerable shipments have been made from the United States into Mexico since 1919 for the purpose of restocking Mexican ranches. In 1921, over 138,000 head were shipped. During the eight years, 1919–1927, total importations into Mexico have been far larger than exportations. If census data and estimates of the Mexican cattle population are correct, it is highly probable that restocking is about complete as compared with pre-war years. In 1926, for the first time since 1920, Mexican imports into the United States exceeded exports of this country to Mexico.

TABLE 60

EXPORTS OF FRESH BEEF FROM CANADA, 1910–1927

(Thousand pounds, i.e., 000 omitted.)

Fiscal year ended Mar. 31	Total exports	To Great Britain	To United States	To all other countries
1910	1,318	828	49	442
1911	974	482	2	490
1912	949	274	6	669
1913	1,571	783	19	769
1914	13,133	191	12,638	305
1915	18,828	1,330	17,037	461
1916	47,223	13,912	9,433	24,077
1917	45,546	15,179	10,040	20,327
1918	86,565	32,768	12,673	41,124
1919	125,803	91,645	32,966	1,192
1920	103,900	28,731	34,418	40,751
1921	51,999	8,884	35,838	7,277
Calendar years				
1922	26,340	6,232	18,584	1,525
1923	22,772	6,232	13,087	3,452
1924	23,207	6,364	9,808	7,034
1925	34,628	10,423	10,105	14,099
1926	27,234	3,517	16,242	7,475
1927	56,742	581	51,473	4,688

Sources of data: 1910–1921, U. S. Tariff Commission. The cattle industries of the United States and Canada, Spec. Pub. *p. 14*, 1925. 1922–1926, U. S. Dept. Agr. Bur. Agr. Econ. Cattle and beef. Foreign Crops and Markets **15** (7): 235, 1927. 1927, U. S. Dept. Agr. Bur. Agr. Econ. Cattle and beef. Foreign Crops and Markets **17** (6): 226, 1928.

TABLE 61

NUMBER OF CATTLE IN MEXICO

Year	Number head
1902	5,142,457
1920	2,163,000
1923	2,363,427
1924	2,187,867
1926	5,584,892

Sources of data: 1902, 1920, U. S. Tariff Commission, Cattle and beef in the United States. Tariff Information Series **30**: 54; 1922. 1923, 1924, 1926: U. S. Dept. Commerce. Mexican livestock census. Foodstuffs 'Round the World. Foreign Notes on Meats, Fats, Oils and Livestock (mimeographed). Jan. 20, 1928.

TABLE 62

TRADE IN LIVE CATTLE BETWEEN THE UNITED STATES AND MEXICO, 1910–1927

Fiscal year	General imports into the United States from Mexico	Domestic exports from the United States to Mexico	Calendar year	General imports into the United States from Mexico	Domestic exports from the United States to Mexico
1910	188,141	5,149	1919	90,541	23,923
1911	177,981	6,513	1920	58,926	27,758
1912	315,227	9,457	1921	13,874	138,239
1913	391,477	8,358	1922	30,127	71,173
1914	625,253	7,230	1923		26,525
1915	346,004	829	1924	11,367	54,785
1916	197,788	3,990	1925	24,169	73,245
1917	183,827	4,324	1926	54,079	17,458
1918	105,470	7,777	1927		

Sources of data: Imports 1910–1924 and exports 1910–1923, U. S. Tariff Commission. The cattle industries of the United States and Canada. Spec. Pub. 1625. Imports 1925–1926 and exports 1924–1926, U. S. Dept. Commerce. Commerce and Navigation of the United States **1924, 1925, 1926.**

South America.—South America has the largest cattle surplus in the world. Between 1909–1914 and 1921–1925 the cattle population increased approximately 27.5 per cent. The increases have been general over South America, especially in Argentina and Colombia.

Accurate current data on the cattle industry in *Argentina* are somewhat difficult to obtain. The present number[43] of cattle is estimated at 30,000,000. The census for December 31, 1922, gave the number as 37,065,000, an increase of almost 50 per cent over the pre-war period.

Argentina is by far the largest exporter of beef, particularly of fresh beef. This position has been reached during the last twenty-five years, partly as a result of the decreasing American beef and cattle surplus and partly because of changes in management which have greatly increased its beef surplus.

Exports of frozen and chilled beef have shown a definite and distinct trend since the beginning of the present century. While exports were stimulated during the war they did not reach a peak until 1924 and 1925. During the latter two years exports of frozen and chilled beef exceeded those of the war period by over 50 per cent. Recent information gives indications of a smaller slaughter during 1927 than in the peak years 1924 and 1925. If estimates of the cattle population made during 1927 are correct, the surplus from the Argentine should be lower. While exports do not enter the United States

[43] U. S. Dept. Agr. Bur. Agr. Econ. The world situation in cattle and beef. Foreign crops and Markets 15 (7):217. 1927.

on account of quarantine regulations, Argentine exports enter the English and continental markets, thereby having an effect on Canadian exports.

TABLE 63

Exports of Beef from Argentina, 1900–1927

(Thousand tons, i.e., 000 omitted.)

Year	Frozen and chilled			Total	Jerked	Canned
	To United Kingdom	To United States.	To other countries			
1900	27	.....	.....	27	18	2
1901	48	.....	2	49	27	1
1902	60	.....	17	77	25	2
1903	67	.....	23	90	14	4
1904	90	.....	18	108	13	3
1905	141	.....	28	168	28	3
1906	150	.....	19	170	5	1
1907	145	.....	8	152	12	2
1908	196	.....	4	199	7	2
1909	231	.....	1	232	13	7
1910	278	.....	2	280	10	13
1911	332	.....	13	345	13	17
1912	362	.....	16	378	8	20
1913	391	4	9	404	4	14
1914	340	65	2	407	3	14
1915	330	44	26	400	.....	35
1916	395	10	67	471	1	49
1917	313	2	121	435	8	111
1918	306	1	239	546	3	211
1919	323	2	117	442	9	137
1920	386	7	66	459	3	15
1921	391	1	39	430	3	18
1922	430	1	22	454	7	40
1923	503	1	82	586	5	75
1924	563	2	243	808	17	90
1925	510	.....	228	738	15	77
1926	574	1	150	725	10	.....
1927	608	2	167	777	9	.....

Sources of data: 1900–1924, Arner, G. B. L. The cattle situation in Argentina, U. S. Dept. Agr. mimeographed report, *pp. 50–52;* 1924. 1925–1927, U. S. Dept. Agr. Exports of beef from Argentina. Foreign Crops and Markets **17** (6): 237; 1928.

To a considerable degree, the extent and rapidity with which beef production may expand appears to depend primarily on the markets of western Europe. With the passing of the world depression in the cattle industry it is probable that continued expansion will occur, as no other country in the world has a comparable area so admirably adapted to the best forage crops and corn combined with a year-long grazing system.

From the standpoint of numbers of cattle, *Brazil* ranks next to Argentina. The Brazilian movement of beef did not attain importance

until the world-war period. Since the war exports of beef have been somewhat erratic, showing no pronounced trend. Live-cattle exports, on the other hand, are large, amounting in some years to over one million head. Brazil has great potential possibilities for the development of the cattle industry and will undoubtedly be a factor which must be reckoned with in the future.

Uruguay is the only other South American country that has as yet exported frozen or chilled beef in large quantities, although Brazil and Paraguay have sent out rather small amounts. While the number of cattle has apparently not increased greatly since the war,[44] the exports of beef and beef products during 1925 and 1926 were three times greater than the average of the pre-war years, 1911–1913.

Europe.—While European production of beef is greater than that of any other equal area of the world, it is the one great area of deficiency in beef and beef products. On account of the war devastations, estimated average yearly totals of cattle were almost 1 per cent lower during 1921–1925 than for the five-year period 1909–1914. While France, Germany, Belgium, and Jugoslavia showed decreases, most of the other European nations either maintained *status quo* or gained in cattle population. Every indication points to an increase in the number of cattle since the close of the war so that at present (1928) numbers are apparently on a level with the pre-war figures.

In 1927, the cattle population of *France* had almost reached the pre-war average for 1909–1913. France is consuming much more chilled and frozen beef than before the war, imports in 1927 aggregating 121,000,000 pounds compared with 5,098,000 in 1913. The 1926 figures, however, are considerably below those of 1925 or 1924. This decrease may be expected to continue with the increase in the cattle population.

Imports of fresh, chilled, and frozen beef into *Germany* during the five years 1923–1927, have been many times larger than those in 1913. The increase between 1923 and 1925 was almost 150 per cent. From 1925 to 1927 imports of beef products were almost stationary but larger numbers of live cattle entered the country. This increase in imports into Germany might have been expected owing to the depletion of the cattle population during the war. Efforts have been made to bring the livestock population back to pre-war numbers. It will be noted (able 64) that the number of cattle in 1927 was almost equal to the number in 1913, while the number of swine exceeded that of the pre-war year.

[44] Number of cattle in Uruguay, 1908, 8,193,000; 1924, 8,432,000.

With the tendency for the German livestock population to increase and with an apparently steady consumption, there does not seem to be any reason for greatly increased importations into Germany.

The trade in meat products in *Russia* has been comparatively unimportant; the large population does not permit an extensive export trade, nor under normal conditions is an import trade required to augment domestic production, since the country supplies its own requirements. Data with reference to the cattle population point to a considerable increase (approximately 30 per cent) in 1925 compared with 1909–1913.

TABLE 64

Head of Livestock in Germany, December 1, 1913, 1926, 1927

(Present boundaries; thousands, i.e., 000 omitted.)

	1913	1926	1927
Horses	3,807	3,873	3,805
Cattle	18,474	17,221	17,983
Sheep	4,988	4,080	3,813
Swine	22,533	19,424	22,880
Goats	3,164	3,484	3,218
Poultry	71,907	75,705	79,078

Sources of data: Landbrugraadet, Den tyske Kreaturtaelling pr. 1. December 1927. Landbrugsraadets Meddelelser **1928**: 112. Copenhagen, Denmark, 1928.

While the **United Kingdom** is the dominant nation in the import trade in beef and beef products, supplies produced at home have an effect on the volume of imports. Home production since the war has been slightly less than that for the pre-war years, although the cattle population is approximately the same. Imports of fresh, chilled, and frozen beef during the three years 1923–1925 were well above those for 1913, although those for 1926 and 1927 were considerably below the 1913 level.

Africa.—While the cattle population of Africa is relatively small, a 70 per cent gain in numbers is estimated to have occurred between 1909–1913 and 1921–1925. With the exception of Algeria and Egypt, gains seem to have been general over the entire continent. The largest numerical increases have occurred in the Union of South Africa, which now has a cattle population of approximately ten million. The industry experienced an abnormal expansion during the war period and a consequent depression during the readjustment immediately afterwards. Exceptionally large increases in cattle have occurred in Kenya Colony, Rhodesia, Tanganyika Territory, and Madagascar.

Conditions seem favorable to build in the future a cattle industry in Africa which will indirectly compete with that of the United States.

Asia.—While the continent of Asia contains almost 40 per cent of the cattle of the world, the trade is relatively unimportant owing to religious customs, etc., prevailing over a large part of Asia. It is of some interest to note that Japan has greatly increased its demand for beef since the war. The number of cattle in the Philippine Islands has more than doubled since the period 1909–1913.

Oceania.—The number of cattle in Australia and New Zealand is relatively small when compared with world totals but it is of especial importance on account of the large surplus available for export.

Exports of beef from *Australia* fluctuate considerably from year to year. From available data on hand exports during the fiscal year 1925–1926 were approximately equal to those for the calendar year 1913; 1926–27 exports showed a sharp decline compared with the previous years, decreasing by 47.6 per cent. The number of cattle in 1927 (11,880,000) showed an increase over that in the pre-war period 1909–1913 of approximately 3 per cent. Since the war Australian exports have been more widely distributed than previously, seeking other outlets than the British market.

The number of cattle in *New Zealand* has increased over 60 per cent since the pre-war years, 1909–1913. This augmentation of population has come about largely through additions to dairy herds. The exports of frozen and chilled beef have increased even more than the increase in cattle population.

CATTLE HIDES

Hides have always been one of the most valuable by-products of the cattle industry, and with the advent of the modern packing-house, the tannery has grown up as a separate enterprise. The tanning industry is one of the few great enterprises dependent upon the meat-packing business which has not to any considerable degree become an integral part of it. Clemen[45] states that the greatest percentage returns to the packer come from by-products of the steer (table 65), which are followed by those from sheep. The percentage of return for the hide of the steer makes up some 8.6 per cent of the value of the animal.

[45] Clemen, Rudolf A. By-products in the packing industry. 410 pp., 50 fig. University of Chicago Press, 1927.

Hides are separated into two classes at the market, packer hides and country hides. Packer hides are characterized as having been taken off uniformly, cured and stored under standard conditions and available in lots of several thousand of a grade. Country hides are removed according to the ideas of the skinner, usually imperfectly stored and cured, show frequent cuts and gashes, and are available in a variety of grades made up of small numbers. In addition to these general classes, there are a number of further subdivisions.

TABLE 65

Percentage Money Returns from Meat and By-products of Various Farm Animals

Animal	Percentage returns from		
	Meat	By-products	Hide or pelt
Steer	87.3	4.1	8.6
Calf	92.8	7.2	Sold with carcass
Hog	96.6	3.4	Sold with carcass
Sheep	81.4	4.1	14.5

Source of data: Clemen, Rudolf A. By-products in the packing industry. *410 pp. 50 fig.* University of Chicago Press, Chicago. 1927.

Prices.—Comparable prices of hides in California over a long period of years are not available. While it is difficult to state definitely what grade of Chicago packer hides would be exactly comparable with Pacific Coast packer hides, it is estimated that 75 to 85 per cent of the latter are comparable with those from Colorado steers. Prices for Colorado hides are available over a long period. Since 1923 it has been possible to obtain the average monthly selling price of hides at San Francisco.

From 1893 to the outbreak of the war the trend of cattle hide prices was upward. Before the outbreak of the European War, hide and leather prices began to rise rapidly. With the stimulation caused by the war, prices remained relatively high, although purchasing power receded during the years 1916–19198. With the deflation in 1920 hide prices fell rapidly. The restriction of European buying power and the decrease in military demand made America the best outlet for hides. Prices fell in 1921 to lower levels than during any year since 1908. Values from 1920 to 1926 were exceptionally low compared with values of commodities in general. The value of Colorado steer hides in 1926 showed a purchasing power of slightly over 50 per cent of the pre-war purchasing power. During the spring of 1927 hides began to show a very definite upward trend.

Clemen[46] states that there is a distinct seasonal variation in hide prices which reflects adjustments on the basis of quality. From December to April prices in Chicago decline; the quality improves and prices move upward from April to November. Whether or not prices in California follow this seasonality cannot be definitely stated owing to the lack of comparable data.

TABLE 66

IMPORTS AND EXPORTS OF CATTLE HIDES, UNITED STATES, 1900–1927

(Thousand pounds, i.e., 000 omitted.)

Year ending June 30	Imports	Exports	Year ending	Imports	Exports
			June 30		
1900	163,865	7,486	1915	334,341	21,136
1901	129,175	11,162	1916	434,178	13,284
1902	148,628	9,373	1917	386,600	7,365
1903	131,640	12,860	1918	267,499	7,024
1904	85,370	32,728	Dec. 31		
1905	113,177	10,269	1918	221,051	2,338
1906	156,155	10,753	1919	407,282	16,996
1907	134,671	15,397	1920	275,324	11,485
1908	98,353	14,650	1921	180,186	20,693
1909	192,252	12,859	1922	324,476	18,854
1910	318,004	14,635	1923	291,969	23,853
1911	150,128	44,594	1924	185,615	79,706
1912	251,013	17,445	1925	166,793	49,916
1913	268,042	17,972	1926	150,452	51,773
1914	279,963	12,525	1927	237,234	37,552

NOTE.—In addition to the above large numbers of "pieces" are imported and exported—5,142,660 pieces being imported and 836,555 "pieces" being exported in 1927.

Calf skin imports in 1927 were 44,070,322 pounds and 6,973,216 "pieces." Exports were 15,096,478 pounds and 1,229,118 "pieces."

Sources of data: 1900–1918, U. S. Dept. Commerce, Commerce and Navigation of the United States, 1901-1919. 1918–1927, U. S. Dept. Commerce. Monthly Summary of Foreign Commerce of the United States, June issues.

Since 1900 conditions in the hide business have been more unfavorable than in the beef business. The percentage relationship between the value of the hide and the value of beef has been declining, although there have been two favorable periods in 1902–1908 and 1914–1917. Since the spring of 1927 there has been a marked improvement in this relationship. The purchasing power during 1927 was still low. There is a lack of correspondence between hide supply and demand which results in sharp variations in prices.

Imports and Exports.—The United States has been a heavy importer of hides since the latter part of the nineteenth century. Since 1900, imports have never been less than 85 million pounds and have gone as high as 434 million pounds.

[46] Clemen, Rudolf A. By-products in the packing industry. 410 pp., 50 fig. University of Chicago Press, Chicago, 1927.

The removal of the hide tariff in 1909 tended to stimulate imports. The war in 1914 further stimulated business, trade disturbances in Europe making the United States the best outlet for surplus supplies.

During recent years the supply of cattle hides in the United States has averaged between sixteen and one-half and seventeen millions, of which approximately three-quarters are produced from the slaughter of domestic cattle, the remainder being imported annually.

TABLE 67

AVERAGE MONTHLY PRICES OF PACKER HIDES—COLORADO STEERS—CHICAGO, 1916–1928

(Cured basis, per 100 pounds)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Aver-age
1916	$19.00	$19.68	$19.75	$20.62	$22.44	$23.69	$23.52	$22.88	$23.27	$26.31	$29.88	$31.40	$23.53
1917	31.00	30.50	29.50	29.69	30.50	31.07	31.31	30.81	26.95	28.62	29.56	28.12	29.80
1918	25.50	24.25	21.10	24.37	27.75	29.55	30.00	27.00	27.00	27.00	26.00	26.00	26.29
1919	25.00	25.00	20.70	27.50	34.60	39.12	46.87	48.00	39.62	38.75	37.70	33.63	34.71
1920	32.75	32.62	30.00	30.56	32.25	32.50	26.50	24.50	22.12	19.60	14.75	14.00	26.01
1921	12.85	11.00	8.87	7.95	11.25	12.50	12.35	12.50	12.50	13.25	14.25	15.00	12.02
1922	15.00	14.44	11.81	11.55	12.81	14.33	15.80	17.50	18.45	19.75	20.00	18.30	15.81
1923	16.87	17.00	17.00	17.00	16.62	13.95	12.12	12.25	11.50	11.50	10.62	10.50	13.91
1924	11.88	14.00	12.15	10.88	10.70	11.00	11.75	13.40	13.75	14.25	15.18	14.88	12.82
1925	15.00	14.63	13.50	13.50	13.30	12.81	14.12	14.80	15.00	14.90	14.12	13.87	14.13
1926	13.75	11.75	11.50	10.63	12.10	11.88	12.60	13.31	13.63	14.70	13.63	13.80	12.77
1927	14.20	13.13	13.00	14.25	15.94	17.50	19.35	18.63	20.75	21.30	22.65	23.75	17.87
1928	25.38	23.20	22.75	24.69	23.20	21.50	23.12	22.05	22.00				

Source of data: 1916–1928, data contained in letter from C. V. Whalin, Marketing Livestock, Meats and Wool Division of Bur. Agr. Econ. to W. E. Schneider, Bur. Agr. Econ., San Francisco.

TABLE 68

RELATIVE PRICES AND PURCHASING POWER OF PACKER HIDES—COLORADO STEERS, CHICAGO, 1910–1927

Year	Relative price	Purchasing power	Year	Relative price	Purchasing power
1910	85.8	83.4	1919	221.8	105.5
1911	86.1	90.9	1920	166.2	69.6
1912	101.5	100.6	1921	76.8	51.6
1913	110.3	108.3	1922	101.0	66.7
1914	116.3	116.4	1923	88.9	56.8
1915	130.3	127.0	1924	81.9	53.8
1916	150.4	116.5	1925	90.3	55.9
1917	190.4	105.6	1926	81.6	53.0
1918	168.0	84.9	1927	114.2	76.1

Sources of data: Original data upon which relatives are based have been taken from the following: 1910–1925, U. S. Dept. Agr. Statistics of cattle, calves, beef, veal, hides and skins. U. S. Dept. Agr. Stat. Bul. **20**: 311. 1927. 1916–1927, table 67, p. 195. Relative prices on 1910–1914 base = 100 = $15.65. Calculations 1910–1925, U. S. Dept. Agr. Statistics of cattle, calves, beef, veal, hides and skins. U. S. Dept. Agr. Stat. Bul. **20**: 311. 1927. 1916–1917, table 67, p. 195. Relative prices on 1910–1914 base = 100 = $15.65. Calculations by authors. Purchasing power based upon U. S. Bur. Labor Statistics All-commodity Index 1910–1914 = 100.

Canada, Argentina, Brazil, and Uruguay supply this country with a large proportion of its hide imports, supplemented by China and Australia.

Of the hides imported, approximately one-third are dry hides and two-thirds wet-salted or pickled and green. Tanners prefer the wet or green hides to those that have been dried because of the ease of tanning and lack of the breaks which are found in dry hides which have been shipped long distances.

TABLE 69
AVERAGE SELLING PRICES OF HIDES AT SAN FRANCISCO
(Cents per pound.)

Month	1923		1924		1925		1926		1927		1928	
	Steers	Cows	Steers	Cows	Steers	Cows	Steers	Cows	Steers	Cows	Steers	Cows
January	13½	10½	9½	7½	14½	12¼	10½	9½	13¼	12¼	.....	.....
February	14	11	9¾	7¾	12	11	10½	9½	11½	10¾	.....	.....
March	13	10	9½	7½	12¼	11	10	9	11½	10¾	20½	20
April	13	10	10	7½	11¾	11	10¾	9¾	12½	11½	19⅛	19
May	11½	10½	9	7	11½	11	11	11	15	14½	.....	.....
June	10½	8½	9½	7½	12½	12	11½	11	17	17	.....	.....
July	9½	7½	11	9	14	13½	12¼	12¼	18	18	.....	.....
August	9½	7½	12	10	14¼	13¾	12½	12	20	20	.....	.....
September	10	8	13	11	14	12	13¼	12½	19½	19½	.....	.....
October	8½	6½	13½	11	13¼	12	13	12	20	20	.....	.....
November	8	6¼	13	11	13½	11½	12¾	11¾	22	20½	.....	.....
December	8½	6½	13	11	12½	10½	13¼	12¼	24	21½	.....	.....
Average	10.8	9.1	11.1	9.0	13.0	11.8	11.77	11.0	17.02	16.35	.....	.....

Source of data: W. E. Schneider, U. S. Dept. Agr., Bur. Agr. Econ., San Francisco, Calif.

DISEASE

Estimates made by the Bureau of Animal Industry of the United States Department of Agriculture and the California State Department of Agriculture indicate that the percentage of tuberculosis in cattle in California is high. This particularly refers to dairy cattle, although the disease is not entirely confined to dairy herds. In two of the important beef-cattle counties of the state, Lassen and Modoc, the percentage of infection is low. These counties were the first to become modified accredited areas.

The Texas fever tick has been eradicated from California and is now confined to the southern states. Reports of anthrax and blackleg within the state during the three years 1926–1928 have been comparatively few and have not been confined to any definite area of the state.