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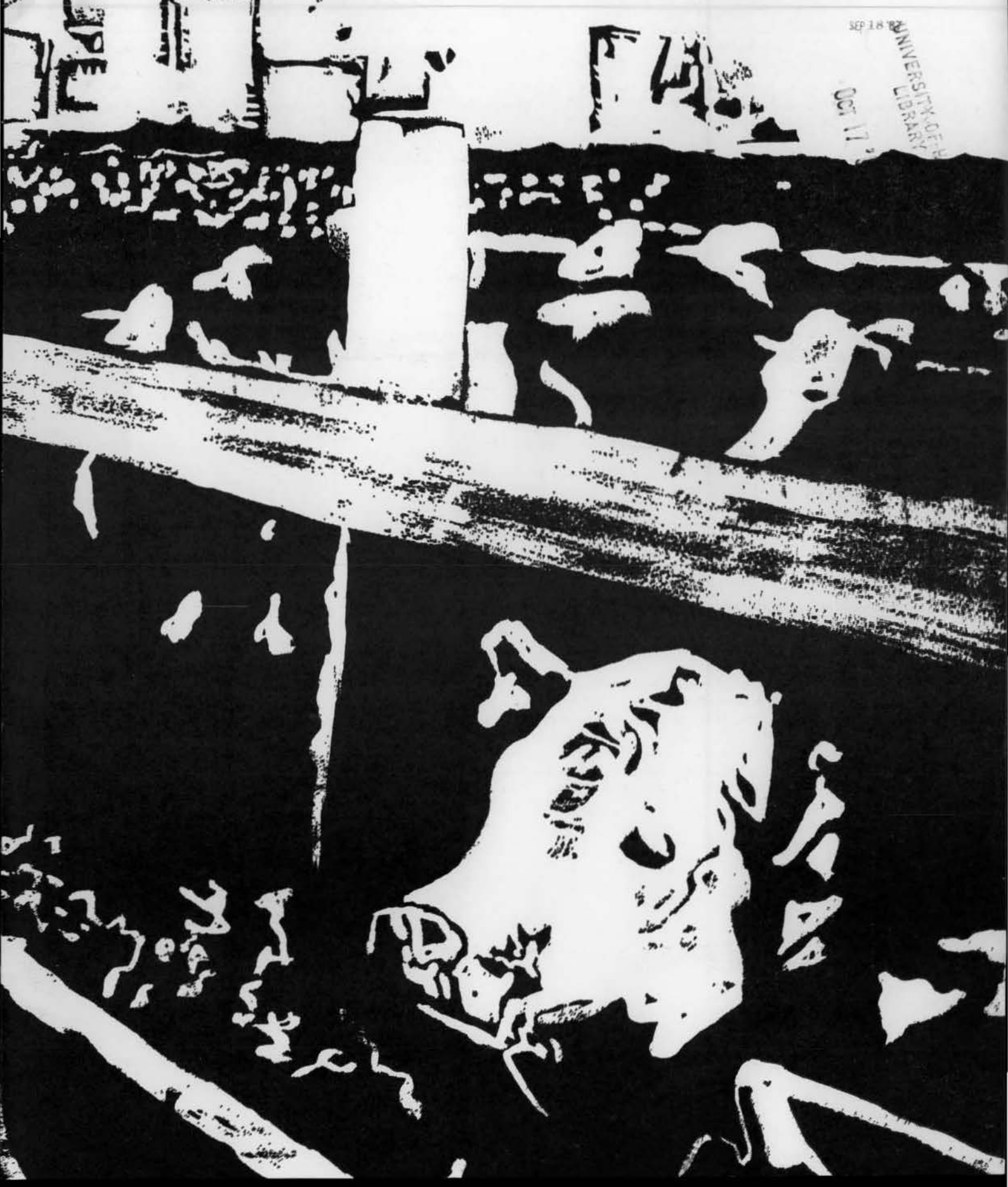
THE WESTERN CATTLE FEEDING INDUSTRY
Structural and Marketing Changes 1952-1962



Foreword

This is a cooperative publication of the U. S. Department of Agriculture Economic Research Service and the Western Experiment Stations. Under the procedure of cooperative publication, this regional report becomes, in effect, an identical publication of each of the cooperating agencies and of each of the experiment stations in the Western Region, and is mailed under the indicia of each. States in the Western Region are Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. Texas is also cooperating in this project.

This publication is the result of research conducted by the Western Livestock Marketing Research Technical Committee under project WM-48, "Livestock Marketing Efficiency and Pricing in the West." The membership of the committee is listed below:

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*Where more than one name is listed, the first is that of the committee member at time of publication. Other names shown are those of earlier committee members for the respective states.

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Acknowledgments

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A Western Regional Research Publication

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The Western Cattle Feeding Industry: Structural and Marketing Changes, 1952-1962*

Gerald E. Marousek

Introduction

The beef cattle feeding industry in the western United States differs in several respects from that of other major cattle feeding areas. These differences exist in such aspects as (1) scale of operations, (2) locational patterns of production, (3) types and sources of feeder cattle and feed supply, and (4) quality demands and market outlets for slaughter cattle.

Rapid expansion in volume of cattle finishing began in several areas in the West during and following World War II. This expansion was encouraged by the wartime demand for beef and postwar income and population increases, particularly on the Pacific Coast and in the Southwest. From this expansion the large-scale commercial feedlot emerged. Its characteristics include dependence upon outside sources of feeder cattle and feedstuffs, use of mechanization and technology in formulation and distribution of feed, ability to operate on a small unit margin, and creation of individual feedlot slaughter cattle markets through direct sale of uniform lots of cattle on a year-round basis.

Although a large percentage of the beef cattle finished in the western states is fed in large-scale commercial lots, many operators continue to feed relatively small numbers of cattle. The size distribution varies among the several western states. Because of this and other factors the physical and economic conditions differ considerably among feeding areas in the West. Therefore, while unique in several respects from other major U. S. cattle feeding regions, the western beef feeding industry is itself quite heterogeneous.

The purpose of this study is to describe and analyze the structure of the cattle feeding industry in the western states in the early 1960's. Number, capacity, size distribution, location, volume, and integration of feedlots were determined by states. Performance factors determined included utilization of capacity, rate of turnover, and feed use efficiency. Information was developed on type and source of cattle placed on feed, type and length of feeding programs, and marketing of fed cattle. Feedlot operations, investment and custom feeding costs were compiled.

Methodology: Data Sources, Time Period, Area

The data used in the study were largely supplied by the Western Regional Livestock Marketing Research Committee members in the several states. Data sources included state publications, unpublished research results, USDA-State Cooperative Crop and Livestock Reporting Service, State Departments of Agriculture, and estimates based on researchers' judgments.

Published and unpublished statistical data from the Statistical Reporting Service, Agricultural Marketing Service, and Economic Research Service of the United States Department of Agriculture were used.

Extensive use was made of an earlier Western Regional Research Publication in measuring changes in western cattle feeding operations during the 1950 decade. This publication, entitled "Marketing Aspects of Western Cattle Finishing Operations" (Nevada Agricultural Experiment Station Bulletin No. 190, December 1955), contains data for 1951-53.

State data varied somewhat in the time period covered. Efforts were made to use data for 1962, but because of differing dates of research progress among the several states, data in some cases are for a year or more earlier or, more often, one or two years later. In such cases the difference in time periods was judged not to affect seriously the measurements involved.

Where comparable data were available for earlier periods, they were used to show the change that had occurred. Such data were most often available only from the early or mid-1950's, allowing for approximately a 10-year comparison.

The 11 western states, Hawaii, and Texas cooperated in and contributed data for the study. However, all 13 states did not have information available on all items included. In certain instances western regional data were used in comparisons with other cattle-feeding regions and the U. S.

*In some instances, data for years prior to, or later than 1962 were used.

I. Structure of the Western Cattle Feeding Industry

Industry structure entails the measurement of the physical dimensions of firms comprising the industry. The factors typically considered include size, number, entry conditions, and concentration of firms in the industry.

Structural elements of an industry provide necessary background for investigation of conduct or patterns of behavior and performance or economic results, at both the firm and industry levels.[1]

Six structural elements were included in this study of the western cattle feeding industry. They were (1) number of feedlots, (2) capacity of feedlots, (3) concentration of size in feedlots, (4) location of western cattle feeding areas, (5) volume of cattle fed, and (6) integration and custom feeding.

Number of Feedlots

There were 8,000 feedlots in the 13 western states (including Hawaii and Texas) in 1962. By states, the number varied from more than 1,500 in Texas to seven in Hawaii. Two of the largest volume feeding states, California and Arizona, contained relatively few lots in terms of total numbers. However, a large proportion of the larger feedlots were located within their boundaries. Table 1 shows the number of feedlots on January 1, 1962, by size groups, with states grouped in such a way that individual lots cannot be identified. The total number represents less than 5 percent of all feedlots in the U. S.

The percentage distribution of feedlots by size in the individual western states is recorded in Table 2. The number of lots from which the size distribution was computed in each state is also shown.

[1]Clodius, Robert L. and Willard F. Mueller, **Journal of Farm Economics,** "Market Structure Analysis as an Orientation for Research in Agricultural Economics," 43:3, P. 517.

Capacity of Feedlots

More than 90 percent of the feedlots with head capacity of 5,000 and over in the western states were located in California, Colorado, and the southwest states of Arizona, New Mexico, and Texas (Table 1), Most of the 25 to 35 feedlots in the U. S. of 16,000-32,000 head capacity during the period 1962-64 (the exact number depending upon the year) were situated in California, Arizona, and Texas. Fifty percent or more of the five to ten lots of 32,000 and over head capacity were located in California during the same period.[2]

Among the western states the average capacity of all lots in the state varied from 2,500 head for California to less than 200 head for Wyoming. While in general the average lot capacity was directly related to the state's total volume of feeding, exceptions occurred. The major feeding states of Colorado and Texas had average lot capacities of only 500 head, while the relatively minor feeding states of New Mexico, Nevada, and Hawaii showed average lot capacities of 1,300 to 1,500 head (Table 3). The number of lots of course, is also a determinant of feeding volume.

Concentration of Size in Feedlots

Volume concentration, or the proportion of total cattle feeding industry volume produced by a given number or proportion of the total firms in the industry, offers a means of gaining insight into such factors as the expected nature and degree of competition and the level of specialized or commercial development of the industry.

[2] **Number of Feedlots by Size Groups and Number of Fed Cattle Marketed 1962-64,** SRS-9, Statistical Reporting Service, United State Department of Agriculture, Washington, D. C. June 1966.

TABLE 1.—Number of Feedlots in the Western States, January 1, 1962, by Size Group

State(s)	Capacity in Number of Head						
	Under 500	500-999	1,000-2,499	2,500-4,999	5,000-9,999	10,000 and over	Total
Texas and New Mexico	1,414	86	103	40	21	14	1,678
Utah, Nevada, Idaho	1,336	32	32	9	6[1]	....	1,415
Washington, Oregon	1,233	103	63	17	6	....	1,422
Montana, Wyoming	1,294	42	23	5	....	....	1,364
Colorado	1,156	80	46	9	12	7	1,310
Arizona	66	56	41	25	11	11	210
California	....	306[2]	150	70	34	45	605
Hawaii	....	....	....	....	....	....	7[3]
Total	6,499	705	458	175	90	77	8,011

[1] 5,000 and over.

[2] All lots less than 1,000 head.

[3] Number of lots not shown by size.

Source: Statistical Reporting Service, USDA.

TABLE 2.—Percentage Distribution of Feedlots by Size, Western States, 1959-65.

State	Year	Number of Head Capacity at One Time						
		Under 500	500-999	1,000-2,499	2,500-4,999	5,000-9,999	10,000 and up	No.*
		(percent of total feedlots classified)						
California	1962	....	50[1]	25	12	6	7	605
Colorado	1964	87	7	3	1	1	1	1,287
Arizona[2]	1963	....	59[1]	20	9	5	7	238
Texas	1962	86	5	5	2	1	1	1,543
New Mexico[3]	1963	49	20	21	2	4	4	81
Idaho	1959	84	7	9[4]	....	....	....	320
Utah	1964	88	8	4	**	**	0	389
Nevada[5]	1962	34	23	36	7[4]	....	....	75
Washington	1964	86	9	3	1	1[4]	....	623
Oregon	1965	85	9	6[4]	....	....	....	452
Montana	1961	84	12	4	**[4]	....	....	600
Wyoming[6]	1963	92	8[4]	....	....	....	....	663
Hawaii	1962	20	20	40	20	....	....	5

* Number of Lots Classified (100%) = sample size.

** Less than 0.5%.

[1] 500-999 size includes all lots under 1,000 head capacity.

[2] 5,000-9,999 size includes only 5,000-7,999 head capacity; 10,000 and up size includes all 8,000 and up.

[3] Of 40 lots under 500 head capacity, 37 were under 301; all sizes below 2,500 head size include "warm-ups."

[4] Includes all larger size groups.

[5] Includes 20 finishing operations and 55 "warm-up" operations.

[6] Under 500 size includes lots of 0-300 head capacity; 500-999 size includes all lots of 301 and up head capacity.

Source: Western Livestock Marketing Research Committee.

TABLE 3.—Average Capacity of Feedlots by Size, Western States, 1959-1965.

State	Year	Number of Head Capacity at One Time						
		Under 500	500 999	1,000-2,499	2,500-4,999	5,000-9,999	10,000 & up	All Lots
		(Average number of head capacity for each size)						
California	1962		343[1]	1464	3160	6353	16,649	2498
Colorado	1964	185	625	1473	3089	6833	12,857[8]	499
Arizona[2]	1963		417[1]	1447	3310	5900	15,781	2208
Texas[3]	1965							557
New Mexico[4]	1963	163	600	1341	2500	6000	14,000	1283
Idaho	1959	280	619	2060[5]				818
Utah	1964	136	617	1861[5]				233
Nevada[6]	1962	247	624	2078	6040[5]			1378
Washington	1964	200	750	1500	3600	8600[5]		410
Montana	1961	150	550	1768	4000[5]			260
Wyoming[7]	1963	113	782					169
Hawaii	1962							1548

[1] 500-999 size includes all lots under 1,000 head capacity.

[2] 5,000-9,999 size includes only 5,000-7,999 head capacity; 10,000 and up size includes all 8,000 and up.

[3] Lots of 1,000 and up capacity averaged 3,441 head capacity at one time.

[4] Of 40 lots under 500 head capacity, 37 were under 301; all sizes below 2,500 head size include "warm-ups."

[5] Includes all larger size groups.

[6] Includes 20 finishing operations and 55 "warm-up" operations.

[7] Under 500 size includes lots of 0-300 head capacity; 500-999 size includes all lots of 301 & up head capacity.

[8] Probably biased downward because of omission of several large lots in sample.

Source: Western Livestock Marketing Research Committee

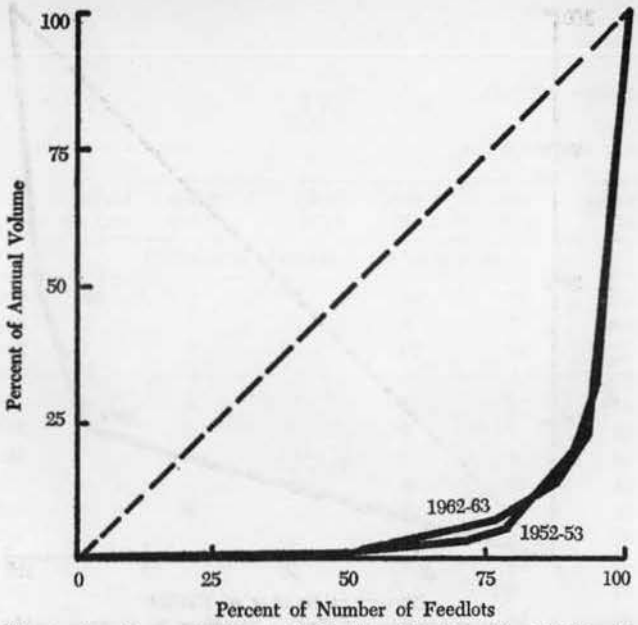


Figure 1.—Concentration of Cattle Feeding in California, 1952-53 and 1962-63.

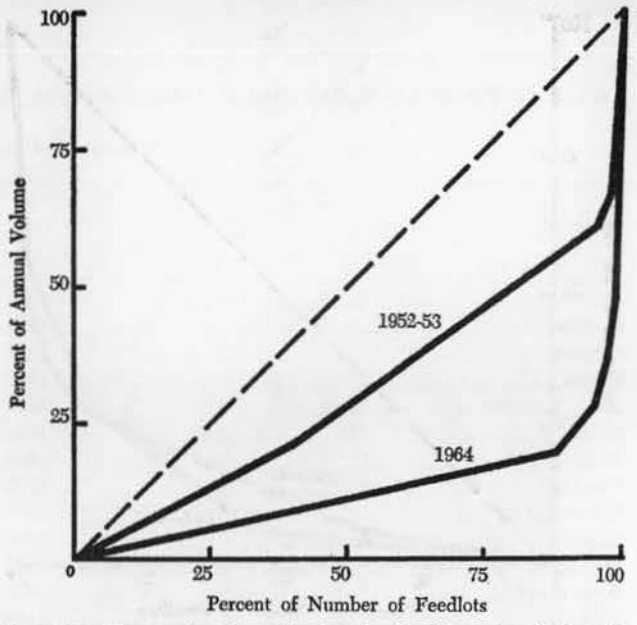


Figure 2.—Concentration of Cattle Feeding in Colorado, 1952-53 and 1964.

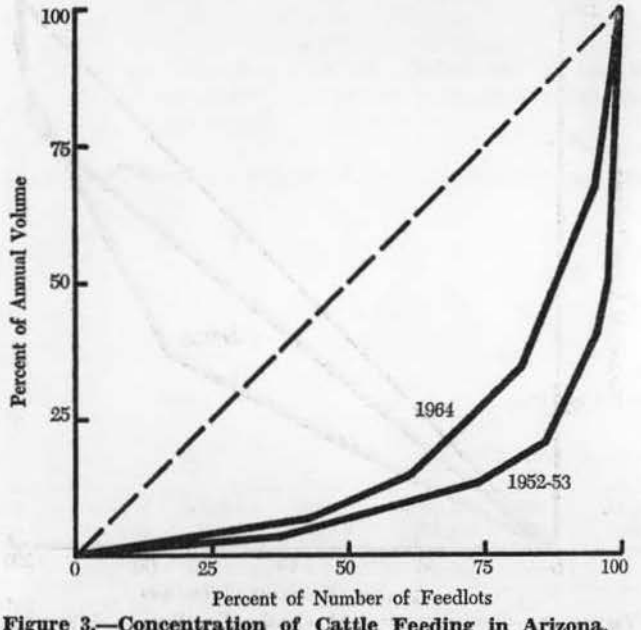


Figure 3.—Concentration of Cattle Feeding in Arizona, 1952-53 and 1964.

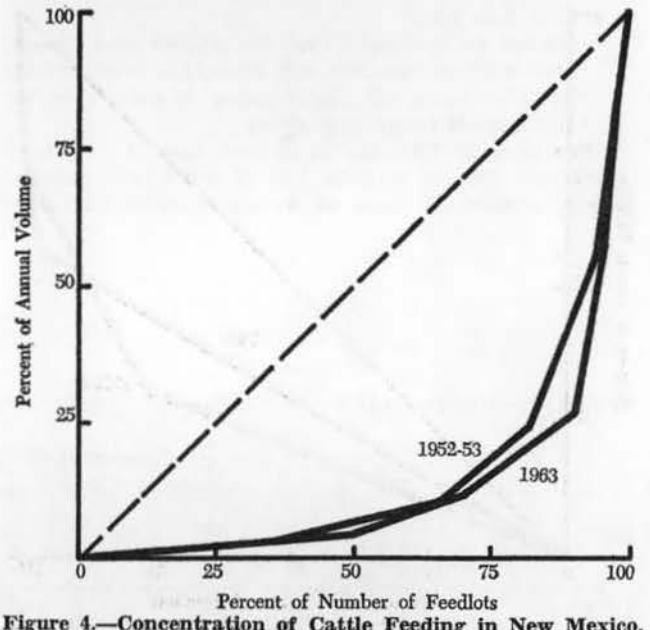


Figure 4.—Concentration of Cattle Feeding in New Mexico, 1952-53 and 1963.

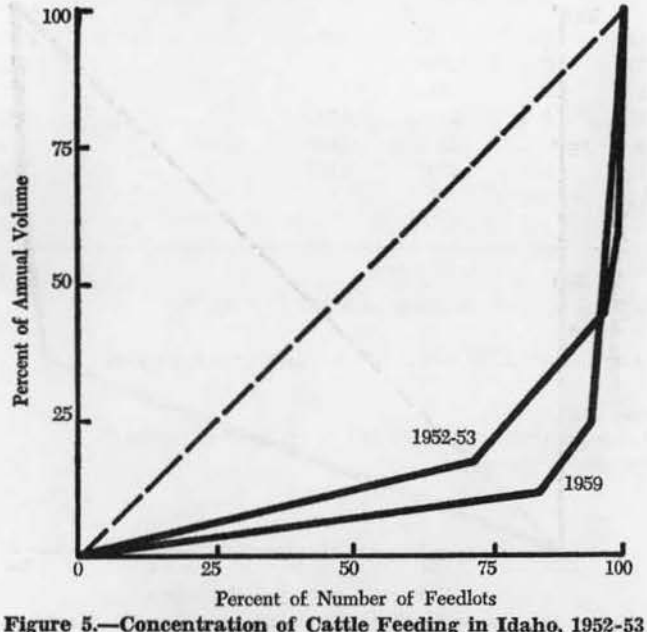


Figure 5.—Concentration of Cattle Feeding in Idaho, 1952-53 and 1959.

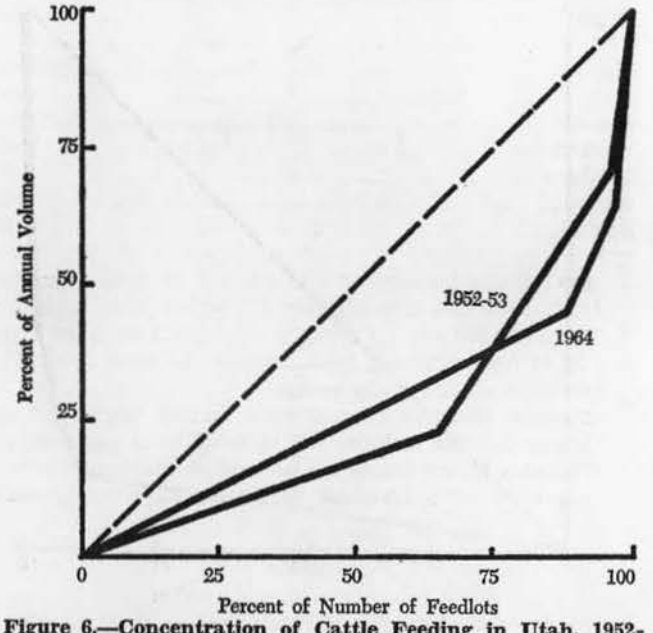


Figure 6.—Concentration of Cattle Feeding in Utah, 1952-53 and 1964.

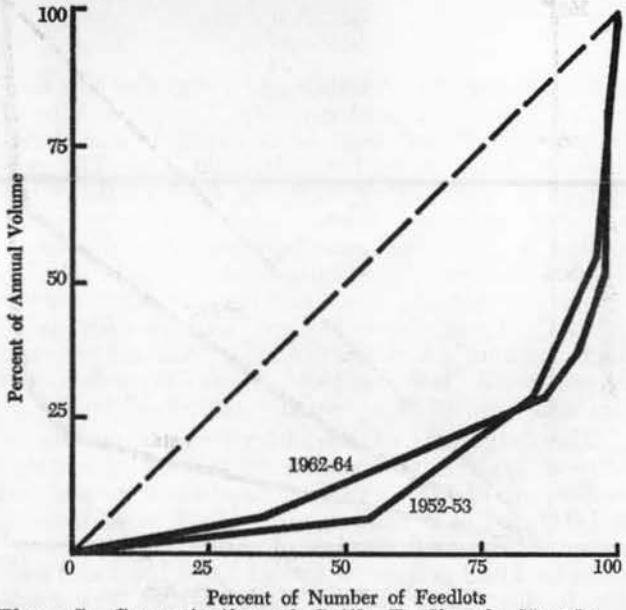


Figure 7.—Concentration of Cattle Feeding in Nevada, 1952-53 and 1962-64.

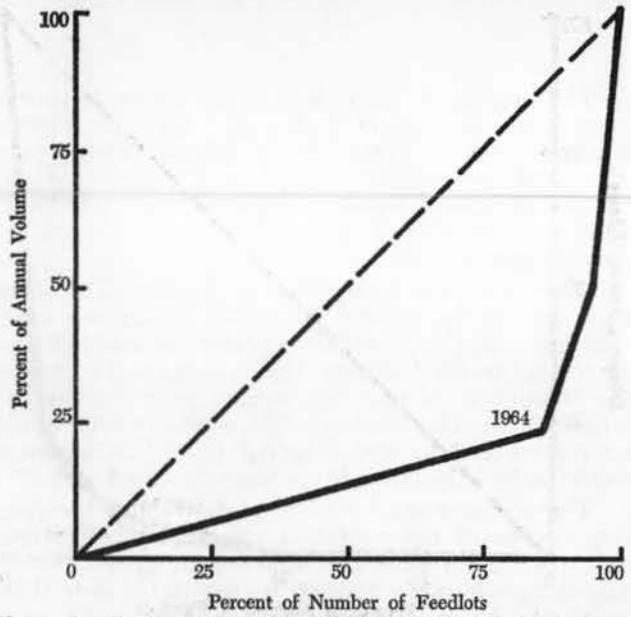


Figure 8.—Concentration of Cattle Feeding in Oregon, 1964.

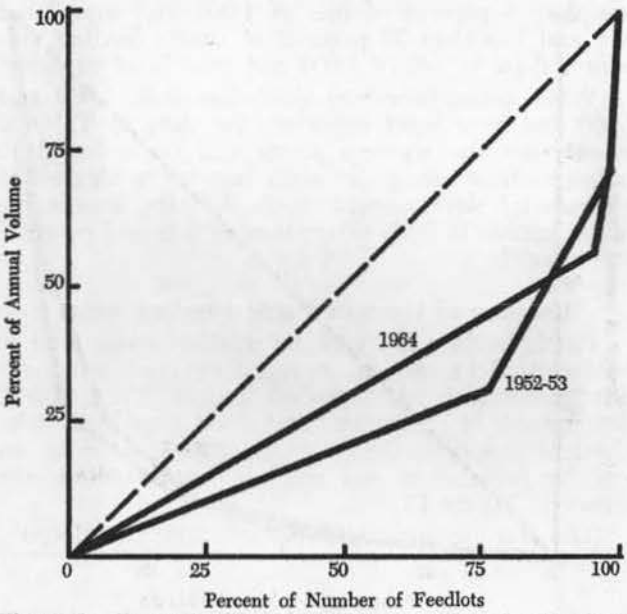


Figure 9.—Concentration of Cattle Feeding in Montana, 1952-53 and 1964.

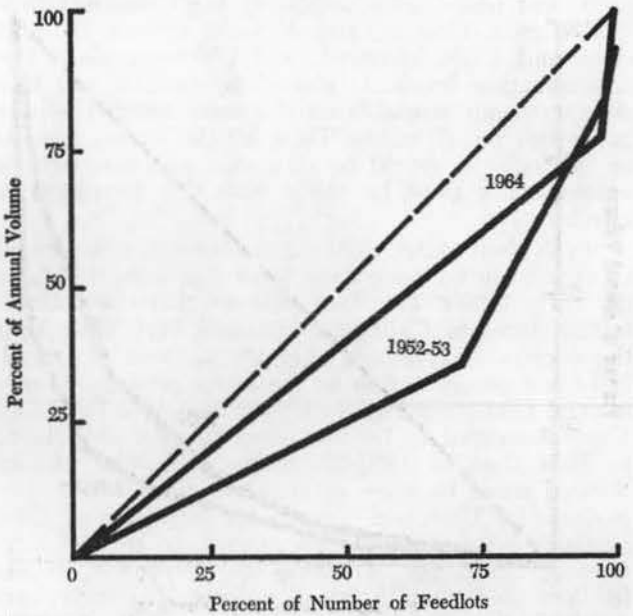


Figure 10.—Concentration of Cattle Feeding in Wyoming, 1952-53 and 1964.

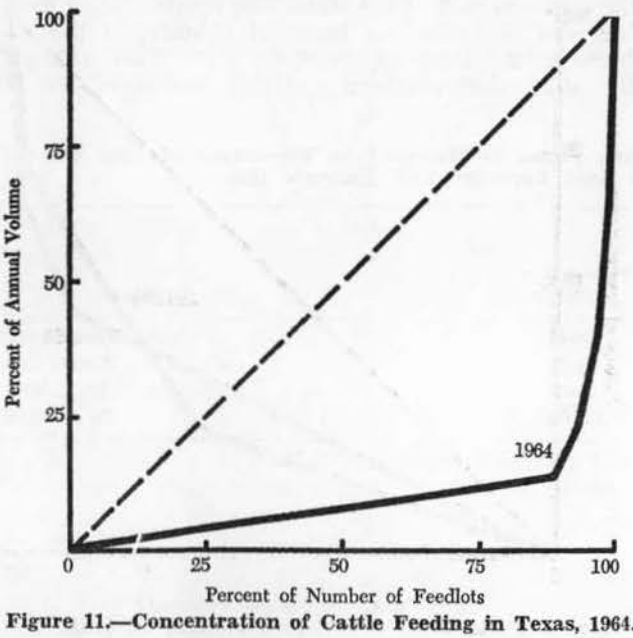


Figure 11.—Concentration of Cattle Feeding in Texas, 1964.

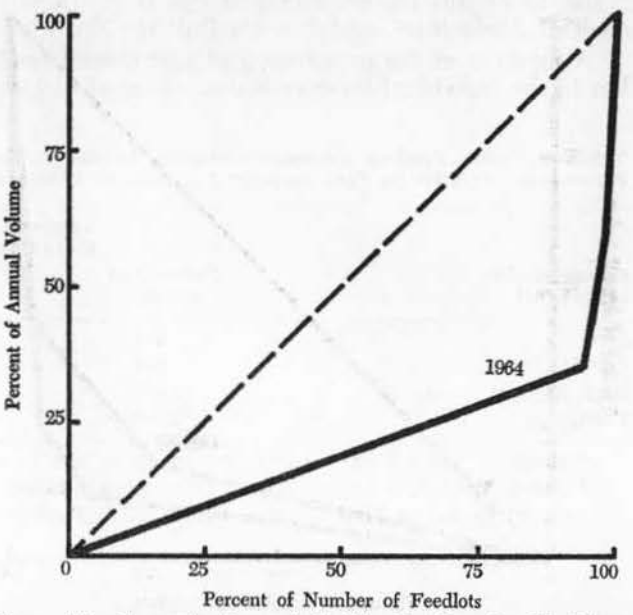


Figure 12.—Concentration of Cattle Feeding in Washington, 1964.

The degree of concentration, by states, is shown graphically in Figures 1 through 12. The curves, known as Lorenz curves, were constructed for each of several size categories by plotting cumulative percentage of annual feedlot volume against cumulative percentage of number of feedlots, for each of several size categories.

The curves are interpreted as follows: The more curvature or the greater the area between the diagonal line and the curve, the greater the volume concentration in the industry, that is to say, the greater the percentage of industry volume produced by the largest firms. The least possible concentration would be represented by the diagonal line. This situation would exist only if all firms were of equal size.

These charts can be used to show both the relative degree of concentration existing among states, and where data were available for an earlier period, any change in concentration within states over time.

California displays the greatest degree of feedlot concentration. Texas, New Mexico, Arizona, Colorado, and Idaho show relatively high concentration. Washington, Oregon, and Nevada appear intermediate and Utah, Montana, and Wyoming show low concentration levels. It should be pointed out that data were not available on the same number of size categories for all states. Thus, all the curves are not as "smooth" as would be desirable and comparisons among states must be made with this limitation in mind.

Individual states differed considerably in regard to change in concentration from the early 1950's to the early 1960's. The data indicate that the concentration level in California changed very little over the decade. In contrast, Colorado showed a markedly higher concentration in the latter period, as commercial feedlots gained in importance over farm lots. There appeared to be less concentration in Arizona in 1964 than in 1952-53. Idaho and New Mexico showed some increase in concentration, while comparisons for Utah and Nevada are inconclusive. Data available were not detailed enough to present adequate pictures for Montana and Wyoming, where feedlots are primarily small volume. No data were available for the earlier period on the remaining states. (Data for Figures 1-12 were taken from Tables 2 and 11 of this report, SRS-9 of the U. S. Department of Agriculture, and Nevada Bulletin No. 190.)

A measure of the importance of commercial feedlots in the individual western states was made by examining the relative number and volume of lots having 1,000 and over head capacity. The percentage of lots with 1,000 and over head capacity was determined for each state, using 1964-66 data. The percentage of each state's cattle on feed in these lots was also computed. States were then grouped according to the importance, by numbers and volume, of 1,000 and over head capacity lots (Table 4). California and Arizona were rated as "highly commercialized"; Texas, New Mexico, and Nevada rated "high medium"; Colorado, Idaho, Washington, and Oregon were "low medium"; Utah, Wyoming, and Montana were of "low commercialization" level.

The definitions of the descriptive terms are as follows: "high" is where over 50 percent of a state's feedlots are of 1,000 and over head capacity and lots of 1,000 and over head capacity feed more than 95 percent of the total number of cattle; "high medium" indicates 11-50 percent of lots of 1,000 head and over size, feeding 76-95 percent of the cattle; "low medium," 5-10 percent of lots of 1,000 and over head capacity, feeding 50-75 percent of total cattle; "low," less than 5 percent of lots of 1,000 and over head size and less than 50 percent of state's feeding volume is done in lots of 1,000 and over head capacity.

While using only two sizes, less than 1,000 and 1,000 and over head capacity, the data in Table 4 reveal that the western states can be grouped in rather distinct categories with respect to degree of commercial development, with definite breaks between groups in both percentage of lots and percentage of cattle.

Location of Western Cattle Feeding Areas

Cattle feeding areas in the western states tend to be localized in certain areas rather than uniformly distributed as in the cornbelt region. These areas, determined by irrigation and feed supply factors, physical geopraphy and climate, and to a lesser extent by population and market considerations, are shown in Figure 13.

The feeding areas within each state are described below.

California

Most of California's cattle feeding is located in the southern part of the state. The single largest feeding area is located in Imperial County, at the extreme southeastern corner of the state. This area and the nine other southern counties accounted for 50

Table 4. Cattle Feeding Commercialization Levels in the Western States as Measured by Percentage of Lots and Percentage of Cattle on Feed January 1 in Lots of 1,000 and Over Head Capacity, 1964 Through 1966.

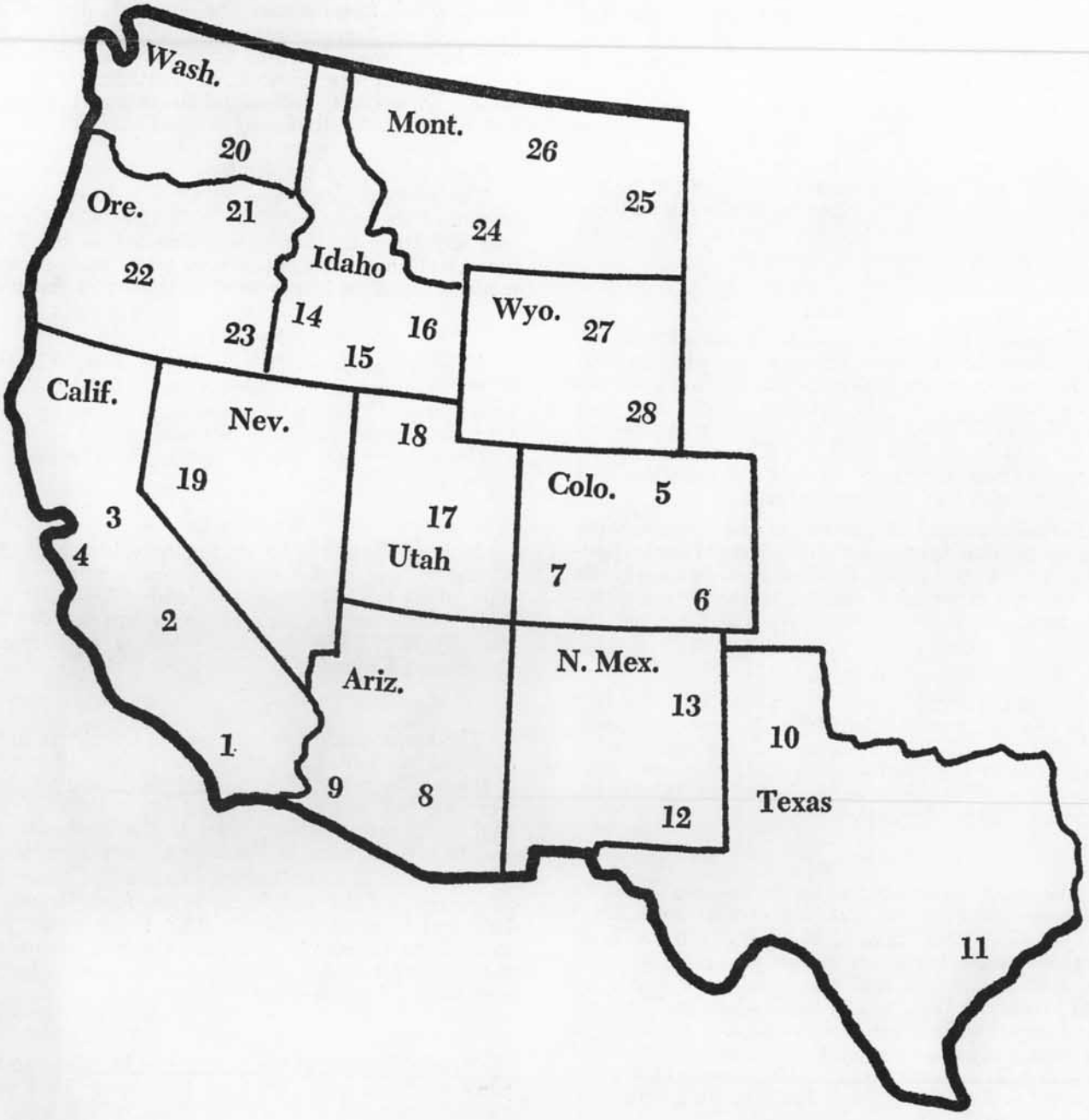
Commercialization Level	1,000 and Over Head Capacity		States
	Percentage of Lots	Percentage of Cattle	
Low	1-4	18-42	Utah, Wyo., Mont.[1]
Low Medium	6-9	60-72	Colo., Ida., Wash., Ore.
High Medium	12-30	83-91	Texas, N. Mex., Nev.[2]
High	52-69	97-99	Calif., Ariz.

[1] Montana had 6% of lots and 52% of cattle in lots of 1,000 and over head capacity in 1966.

[2] Nevada had 72% of cattle in lots of 1,000 and over head capacity in 1966.

Source: **Cattle on Feed** Reports, USDA, SRS, Washington, D. C.

Figure 13.—Location of Cattle Feeding Areas, Western States.



California
1. Imperial Valley
2. San Joaquin Valley
3. Sacramento Valley
4. San Francisco Bay Area

Colorado
5. South Platte River Valley
6. Arkansas River Valley
7. Western Valleys

Arizona
8. Salt River Valley
9. Yuma Area

Texas
10. Panhandle Area
11. Gulf Coast Area

New Mexico
12. Pecos Valley
13. Clovis, Portales Area

Idaho
14. Boise, Caldwell, Weiser Area
15. Twin Falls, Rupert, Burley Area
16. Upper Snake River Area

Utah
17. Sevier, Sanpete, Utah Cos.
18. Brigham City, Logan Area

Nevada
19. Pershing, Churchill, Lyons Cos.

Washington
20. Yakima Co., Columbia Basin

Oregon
21. Umatilla Co.
22. Central Oregon Area
23. Malheur Co.

Montana
24. Billings, Hardin Area
25. Miles City, Sidney Area
26. Shelby, Great Falls, Havre Area

Wyoming
27. Big Horn Basin
28. North Platte River Valley

percent of the feedlots and 60 percent of the cattle on feed in 1962.

The next most important feeding area is the San Joaquin Valley, located in central California, from Bakersfield on the south to Sacramento County on the north. One-fifth of the lots and one-fourth of the cattle were located in this inland area in 1962.

Other California feeding areas include the central coast, from north of San Francisco to south of Monterey, and the Sacramento Valley, from Sacramento north to about Redding. In 1962 each of these areas contained about 10 percent of the feedlots and between 5 and 8 percent of the cattle.

Colorado

The major feeding areas in Colorado include the South Platte River Valley in the northeastern section of the state and the Arkansas River Valley in the southeastern section. The western Platte area (the Fort Collins-Greeley area) contained about one-half of the state's feedlots in 1965. The eastern Platte area, from Fort Morgan to Sterling and eastward, had nearly one-third of the state's feedlots.

Between 10 and 15 percent of the feedlots were located in the Arkansas Valley, from Pueblo eastward, in 1965. A minor feeding area is located on the western slope of Colorado, in the Grand Junction area.

Arizona

The major feeding area in Arizona is in the Salt River Valley around Phoenix and extending south and east toward Tucson. A second concentration of feedlots is in the southwestern section of the state, near Yuma. This is an extension of the California Imperial Valley concentration.

Texas

The most concentrated cattle feeding areas in Texas are the Panhandle section of northwest Texas and the Gulf Coast region, both of which are grain sorghum producing areas. About two-fifths of both the feedlot capacity and the number of cattle on feed January 1, 1965, was in the Panhandle. The Gulf Coast area had between one-fourth and one-third of the state's capacity and cattle on feed. Central and northeast Texas each had 10-15 percent of feedlot capacity and cattle on feed. Little feeding was done in southwest Texas.

New Mexico

More than one-third of the feedlots and nearly 50 percent of the cattle fed in New Mexico in 1963 were located in the Pecos Valley, around Roswell in the southwestern section of the state. The next most important feeding area was near Clovis and Portales in east central New Mexico, adjacent to the Texas Panhandle. Here more than one-third of the total cattle was fed in about one-fifth of the state's feedlots. Smaller feeding areas near Albuquerque and Las Cruces each contributed 5-10 percent to both feedlot numbers and volume. Some feeding was carried on in both the northeastern and southwestern extremes of the state also.

Idaho

Cattle feeding in Idaho is located along the Snake River, which flows across the southern part of the state. The most concentrated feeding area is in southwest Idaho, from Boise to Weiser. Other important feeding areas are located in southcentral Idaho, around Twin Falls, Burley and Rupert, and in southeast Idaho, centered around Idaho Falls.

Utah

The major feeding area in Utah is in the central section of the state, south of Salt Lake City. A second important feeding area is located in the Brigham City-Logan area of northern Utah. Some feeding is also carried on in the southwest part of the state.

Nevada

Nevada's cattle feeding is almost entirely located in the western section of the state, in the Fallon, Lovelock and Yerington areas. A few lots are situated in extreme southern Nevada, near Las Vegas, and some warm-up lots are found in other sections of the state.

Washington

Most of the cattle feeding activity in Washington is carried on in the south central portion of the state, along the Yakima and Columbia Rivers. It generally comprises the area between and surrounding the city of Yakima and the tri-cities of Richland, Pasco, and Kennewick.

Oregon

The major cattle feeding area in Oregon is in the northeast section of the state. More than 40 percent of the total number of cattle on feed January 1, 1962 were located in this area. On July 1, 1963, 57 percent of all cattle on feed were in the northeast area and 49 percent were in Umatilla County (Pendleton).

An area in central Oregon, surrounding Bend, had 25 percent of the state's cattle on feed January 1, 1962 and 17 percent July 1, 1963. Other areas, such as Malheur County in southeast Oregon, adjacent to the southwest Idaho feeding area, accounted for the remainder of the feeding volume.

Montana

Nearly one-half of the feedlots in Montana and 60 percent of the cattle on feed January 1, 1961 were located along the Yellowstone River, which traverses the southwestern portion of the state from southwest to northeast. Within this area, the two counties in which Billings and Sidney are located contained nearly one-third of the state's feedlots.

The "Triangle Area" around Shelby, Havre, and Great Falls comprised the other important feeding area, with nearly 30 percent of the state's feedlots and cattle on feed in 1961.

Wyoming

Cattle feeding in Wyoming is concentrated in two areas. The Big Horn Basin in northwestern Wyoming had 45 percent of the number of feedlots and 52 percent of the state's feedlot capacity in 1963. The North Platte Valley in southeastern Wyoming had 52 per-

cent of the lots and 45 percent of total capacity. Three percent of the lots and capacity were located throughout the rest of the state.

Hawaii

All seven of the cattle finishing lots in Hawaii are located on the Island of Oahu, the main island, on which the city of Honolulu is located.

Volume of Cattle Fed

The number of fed cattle and calves marketed annually in the twelve western states (Hawaii not reported) increased each year from 1955 through 1965, with one minor exception (1957). The volume increase was from 2.4 million head marketed in 1955 to nearly 6.5 million head in 1965. In Texas, the 1965 volume was four times that of 1955. Colorado and Arizona showed a doubling of volume over the 11 year period. Data for other western states, with the exception of California, were for less than the 11-year period. Of these, Wyoming showed a decrease, Utah and Nevada had practically no increase, while the remaining states had increases of less than 100 percent (Table 5).

The 12 western state's volume of fed cattle and calves marketed comprised from 26 to 37 percent of total fed cattle marketings in the major feeding states during the 1955-65 period. While the data show an increasing percentage of cattle finished in the west, the conclusions made therefrom must be tempered by two factors: all western states' data were not reported prior to 1960 and additions were made to the list of major feeding states throughout the period (Table 6).

Keeping in mind the data limitations, it seems evident that Texas recorded a definite increase in its relative share of the total volume of fed cattle marketed in the major feeding states, from less than 3.5 percent in the early part of the 11 year period to over 5 percent in the latter part. Idaho, Wyoming, and Utah show quite definite declining shares over the decade, even though Idaho and Utah had small absolute increases in numbers in the most recent years. In the other states percentage shares show no definite trends.

Examination of volume shares among the western states' total feeding volume show essentially the same result as for the major feeding states' total. Texas has quite definitely increased its shares in recent years. Idaho and Wyoming show somewhat reduced shares. Other states appear to have rather consistent shares during the latter part of the period, in which data are available for all western states (Table 7).

In order to get an indication of cattle feeding volume for all western states for an earlier time period, the number of cattle and calves on feed January 1 was compiled. Although these data do not measure total annual feeding volume, they do give "point" references over time. January 1 cattle on feed data were averaged for two five-year periods (1950-

TABLE 5.—Number of Fed Cattle and Calves Marketed Annually in the Western States and in Total States Reported, 1955-1965.

State(s)	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
					(thousands of head)						
Texas	227	307	291	296	403	477	548	756	896	971	1094
Montana					99	115	113	100	98	128	142
Idaho					227	231	234	221	233	251	271
Wyoming						82	74	72	64	59	62
Colo.	534	582	568	664	708	738	794	815	900	951	1144
N. Mex.						113	99	129	145	166	173
Arizona	313	374	393	410	410	466	514	568	608	600	650
Utah					117	117	109	111	118	133	125
Nevada						45	37	31	30	38	50
Wash.						220	247	258	267	290	306
Oregon						117	130	148	136	147	167
Calif.	1280	1224	1229	1169	1441	1595	1701	1844	1899	2061	2282
Western States	2354	2487	2481	2539	3405	4316	4600	5053	5394	5795	6466
13 States	9001	9347	9385	9730							
21 States					11,848[1]						
26 States						12,874	13,747				
28 States								14,357	15,281		
32 States										17,070	17,593

[1] 26 states for October-December.

Sources: **Cattle and Calves on Feed,** Stat. Bul. No. 277, USDA, AMS, Washington, D. C., January 1961 (1955-59 data);
Supplement for 1961 to Livestock and Meat Statistics 1957, (Stat. Bul. No. 230), USDA, AMS, SRS, ERS, Washington, D.C., (1959-60 data);
Livestock and Meat Statistics 1962, Stat. Bul. No. 333, USDA, AMS, ERS, Washington, D. C., July 1963 (1961-62 data):
Cattle on Feed Reports (Monthly), USDA, SRS, Washington, D.C. (1962-65 data).
(Data unavailable where blanks appear in table.)

54 and 1962-66) to reduce year-to-year fluctuations. The percentage increase in feeding volume from 1950-54 to 1962-66 was then computed. For the western states the increase was 164 percent, compared to 50 percent for the north central states and 84 percent for the U.S. In the West, individual states recorded increases from over 300 percent in Washington, Arizona, and New Mexico to 60-70 percent in Utah, Idaho, and Wyoming and 14 percent in Nevada. Other western states showed increases of 100 to 225 percent. Texas, which increased its volume greatly in more recent years, had a 166 percent increase over the longer, average period (Table 8). Where a state's 1950-54 cattle on feed figure was very small the percentage increase in volume is very large, even though the absolute increase was not large. Washington represents the most extreme example of this.

The percentage increase figures from Table 8 were grouped and used as a means of categorizing cattle feeding growth rates in western states from 1950-54 to 1962-66. Using the U.S. feeding growth rate (84 percent) as the boundary between low and medium growth rates, Idaho, Utah, Nevada, and Wyoming were rated as "low." Colorado and Montana were rated "medium," with growth rates between the U.S. rate and the Western Region rate (84-164 percent). All other western states qualified as "high" growth rate states, with percentage increases greater than 165 percent (Table 9).

Survey data for 12 western states during the

TABLE 6. — Fed Cattle Marketings in the Western States as a Percentage of Total Marketings Reported, 1955-65[1].

State	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
				(percent)							
Texas	2.5	3.3	3.1	3.0	3.4	3.7	4.0	5.3	5.9	5.7	6.2
Montana					0.8	0.9	0.8	0.7	0.6	0.7	0.8
Idaho					1.9	1.8	1.7	1.5	1.5	1.5	1.5
Wyoming						0.6	0.5	0.5	0.4	0.3	0.4
Colorado	5.9	6.2	6.0	6.8	6.0	5.7	5.8	5.7	5.9	5.6	6.5
New Mexico						0.9	0.7	0.9	0.9	1.0	1.0
Arizona	3.5	4.0	4.2	4.2	3.5	3.6	3.7	4.0	4.0	3.5	3.7
Utah					1.0	0.9	0.8	0.8	0.8	0.8	0.7
Nevada						0.3	0.3	0.2	0.2	0.2	0.3
Washington						1.7	1.8	1.8	1.7	1.7	1.7
Oregon						0.9	0.9	1.0	0.9	0.9	0.9
California	14.2	13.1	13.1	11.2	12.2	12.4	12.4	12.8	12.4	12.1	13.0
Western States	26	27	26	26	29	34[2]	33	35	35	34	37

[1] 1955-58, 13 state total
1959, 21 state total
1960-61, 26 state total
1962-63, 28 state total
1964-65, 32 state total

[2] First year all 11 western states were included.

Source: Table 5.

TABLE 7. — Percentage Distribution of Fed Cattle Marketings Within the Western States, 1955-65[1].

State	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
				(percent)							
Texas	10	12	12	12	12	11	12	15	17	17	17
Montana					3	3	2	2	2	2	2
Idaho					7	5	5	4	4	4	4
Wyoming						2	2	1	1	1	1
Colorado	23	23	23	26	21	17	17	16	17	16	18
New Mexico						3	2	3	3	3	3
Arizona	13	15	16	16	12	11	11	11	11	10	10
Utah					3	3	2	2	2	2	2
Nevada						1	1	1	1	1	1
Washington						5	5	5	5	5	5
Oregon						3	3	3	2	2	2
California	54	49	50	46	42	37	37	36	35	36	35

[1] Total for each year includes those states for which shares are shown:
1955-58, 4 states; 1959, 7 states; 1960-65, 12 states.

Source: Table 5.

period 1959-64 showed an average annual volume per feedlot ranging from 167 head in Montana to over 3,000 head in California. Average number of head fed annually, by size groups, is shown for the western states in Table 10. Table 11 gives the percentage distribution of feedlot volume, by size groups.

Integration and Custom Feeding

Custom feeding was reported as comprising from 17 percent of total feeding volume in Colorado and Idaho to 60 percent in California, and 76 percent in Hawaii in selected years in the late 1950's and early 1960's. Very little custom feeding was carried on in lots of less than 1,000 head capacity; most was done in lots of 5,000 and over capacity. Data from states where available are shown in Table 12. Although no figures were available on the proportion of cattle custom fed in Arizona, all custom fed cattle were reported to be in lots of 5,000 and over capacity; 70 percent of custom fed cattle were fed in lots of 10,000 and over capacity.

Comparison of data on reported custom feeding in the early 1960's with data on the amount of custom feeding in 1951-53 indicate that the percentage of cattle custom fed in most states changed little over the 1950 decade. Exceptions were Colorado, which showed nearly double the percentage of custom fed cattle in 1964 as compared to the earlier dates, and New Mexico, which decreased from 65 percent in 1951-53 to 24 percent in 1963. Of the 39 percent of cattle custom fed in nine western states in 1951-53, most were owned by packers or farmers and ranchers (Table 13).

TABLE 8.—Number of Cattle and Calves on Feed January 1: Five Year Average 1950-54 and 1962-66 and Percentage Increase, by States and Regions.

State or Region	Cattle and Calves on Feed January 1 (1,000 head)		Increase in Volume[1] (percent)
	1950-54 Average	1962-66 Average	
California	301	919	205
Colorado	252	512	103
Arizona	81	347	328
Texas	169	449	166
New Mexico	22	91	314
Idaho	89	148	66
Utah	48	77	60
Nevada	21	24	14
Washington	27	129	378
Oregon	29	95	228
Montana	36	83	131
Wyoming	25	43	72
West[2]	1,100	2,905	164
North Central[3]	3,818	5,749	50
United States	5,070	9,307	84

[1] $\frac{\text{1962-66 volume}}{\text{1950-54 volume}} - 1 \times 100 =$ percentage increase.

[2] Includes 12 states listed above.

[3] Includes Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas (12 states).

Source: **Agricultural Statistics**, 1951-55 and 1963-65; SRS, USDA **Cattle on Feed** Reports.

TABLE 9.—Cattle Feeding Growth Rates in the Western States as Measured by Percentage Change in Cattle on Feed January 1, 1950-54 and 1962-66.

Growth Rate[1]	Increase in Volume 1950-54 to 1962-66 (percent)	States
Low	less than 84	Idaho, Utah, Nevada, Wyoming
Medium	84-164	Colo., Montana
High	165 and over	Calif. Ariz., Texas, N. Mex., Wash., Ore.

[1] Low: below U.S. percentage increase (84).
Medium: U.S. percentage increase through Western Region percentage increase (164).
High: above Western Region percentage increase.

Source: Table 8.

TABLE 10.—Average Volume per Feedlot by Size, Western States, 1959-64.

State	Year	Number of Head Capacity at One Time (average number fed annually)						
		Under 500	500-999	1000-2499	2500-4999	5000-9,999	10,000 & up	All Lots
California	1962							3048
Colorado	1964	134	609	1683	3800	9754	21,676	585
Arizona	1963							2508
Texas [1]	1962							490
New Mexico [2]	1963	150	629	1262	3350	5425	17,571	1395
Idaho	1959	234	690	3176 [3]				1104
Utah	1964	117	488	2319 [3]				225
Nevada [4]	1962	198	436	1295	6384 [3]			1060
Washington	1964	372	981			6781 [3]		465
Oregon	1964	71	712	2027 [3]				
Montana	1961	83	325	1040	2667 [3]			167
Hawaii	1962							2272

[1] Lots of 1,000 and up capacity averaged 4,586 head fed annually.
[2] Of 40 lots under 500 head capacity, 37 were under 301; all sizes below 2,500 head size include "warm-ups."
[3] Includes all larger size groups.
[4] Includes 20 finishing operations and 55 "warm-up" operations.
Source: Western Livestock Marketing Research Committee.

TABLE 11.—Percentage Distribution of Total Feedlot Volume, by Size, Within the Western States, 1959-1964.

State	Year	Number of Head Capacity at One Time (Percent of Total Volume)					
		Under 500	500-999	1000-2499	2500-4999	5000-9999	10,000 & up
California	1963		2 [1]	5	8	8	77
Colorado	1964	19	8	9	7	21	36*
Texas [2]	1965						
New Mexico	1963	4	7	15	10	21	43
Idaho	1959	12	12	76 [3]			
Utah	1964	46	17	37 [3]			
Nevada [4]	1962	7	10	40	43 [3]		
Oregon	1964	24	25	51 [3]			
Montana	1962	42	23	19	16 [3]		
Hawaii	1965	8		33		59	

[1] 500-999 size includes all lots under 500 head capacity.
[2] Under 1,000 head capacity, 17 percent of total volume, 1,000 and up head capacity, 83 percent of total volume.
[3] Includes all larger size groups.
[4] Of total number of cattle fed, 51 percent were "warmed-up"; 49 percent were finished.
* Probably biased downward because of omission of several large lots in sample.
Source: Western Livestock Marketing Research Committee.

TABLE 12.—Percentage of Cattle Custom Fed, by Size of Feedlot, Western States, 1959-1965.

State	Year	Total	Feedlot Capacity in Head (percent custom fed [1])				
			Under 1000	1000-2499	2500-4999	5000-9999	10,000 & up
California	1963	60	0	1	1	5	53
Colorado	1964	17	*	1	1	4	11
New Mexico	1963	24	1	1	5	10	7
Idaho	1959	17					
Nevada [2]	1962	40	*	16	24 [3]		
Hawaii	1965	76		17		59	

* Less than 0.5 percent.
[1] Total cattle fed in each state equals 100 percent.
[2] Includes "warm-up" cattle (51 percent) and finished cattle (49 percent).
[3] Includes all lots 2,500 and up head capacity.
Source: Western Livestock Marketing Research Committee.

Vertical integration, or control of more than one level of the production-processing-marketing phenomenon through ownership or contractual arrangement, is used as a guide to the competitive nature of an industry. However, meaningful data by which to measure integration in the livestock industry is not readily available.

Of the 39 percent of cattle custom fed in nine western states in 1951-53, as reported by the Western Regional Livestock Marketing Research Publication, 17 percent were owned by packers. Of the 61 percent owner-fed, 7 percent were owned by packers (52 percent were owned by feeders and 2 percent by sugar beet companies).* This would indicate a packer ownership of about one-fourth of the cattle fed in the west in the early 1950's.

*Scott, Frank S., Jr., **Marketing Aspects of Western Cattle Finishing Operations,** Bulletin No. 190, Nevada Experiment Station, December, 1955, Table 13.

Data from the Packers and Stockyards Division, Agricultural Marketing Service, USDA, show that in the 12 western states (including Texas and Hawaii, but excluding Wyoming) from 13 to 18 percent of the fed cattle marketed were fed for or by meat packers from 1961 through 1964. Individual states varied considerably in the percentage of packer feeding, from less than 4 percent in Oregon (1961) and Colorado (1962) to 38 percent in Washington (1964).

However, in 7 of the 11 states for which data are available, more than one-eighth of the cattle fed in each of the four years were packer owned. In two additional states more than an eighth of the cattle were packer owned in some of the years from 1961 through 1964. Only in Colorado and Oregon were less than 10 percent of the cattle packer owned in each of the four years. In contrast, 2 percent of the fed cattle reported as being marketed from the ten north central states were packer owned in 1961-64,

TABLE 13.—Percentage of Cattle Custom Fed, by Type of Owner, Western States, 1951-53.

State	Total	For Packers	For Farmers and Ranchers (Percent)	For Sugar Beet Co.	For Speculative Feeders
California	58	28	23	*	7
Colorado	9	2	6	*	1
Arizona	57	12	14	*	31
New Mexico	65	42	23	*	*
Idaho [1]	13	11	1	*	1
Utah [1]	23	11	10	*	2
Nevada	30	13	17	*	*
Montana	7	*	7	*	*
Wyoming	9	2	3	2	2
9 States	39	17	15	*	7

*Less than 0.5 percent.

[1] Data for 1951-52 only.

Source: Nevada Bulletin No. 190, Table 13.

TABLE 14. — Cattle and Calves Fed by or for Meat Packers as a Percentage of Total Marketings, by States in the West and Regions, 1961-64.

State or Region	Packer Feeding as a Percentage of Total Marketings 1961	1962	1963	1964
		(percent)		
Texas	20.6	13.5	20.9	16.5
Montana	16.2	14.8	15.6	12.8
Idaho	20.6	26.0	31.7	22.2
Colorado	5.9	3.9	7.2	5.5
New Mexico	19.0	17.6	22.3	16.5
Arizona	5.5	11.8	12.5	11.0
Utah	16.7	15.7	17.4	14.2
Nevada	21.6	27.4	N.A.	14.3
Washington	32.3	28.0	29.4	38.0
Oregon	3.4	4.1	4.4	4.2
California	14.1	17.3	14.4	10.5
Hawaii	N.A.	N.A.	N.A.	N.A.
12 Western States	13.9	14.5	17.6	13.1
10 North Central States	2.2	2.0	2.1	2.2
39 States	6.5	6.6	7.4	6.5

Source: **Packers and Stockyards Resumé,** AMS, USDA, Washington, D. C., II : 11 (Dec. 11, 1964) and III : 11 (Nov. 26, 1965).

and about 7 percent of those marketed from 39 major feeding states (including the west and north central regions) were packer owned (Table 14).

Between 150 and 215 meat packers were engaged in cattle feeding operations in the U. S. during the ten years from 1955 through 1964. The cattle fed by these firms accounted for 4.6 to 7.4 percent of the fed cattle marketings from 39 major feeding states during this period, with the later years showing a somewhat higher percentage than the early years of the decade (Table 15).

While most of the cattle feeding carried out by processing and marketing firms was done by meat packers, retail food chains fed cattle in some areas. Packers and Stockyards Division, USDA, reports for 1962 and 1963 show that, of all packer and retailer feeding, between 30 percent and 35 percent was performed by ten major meat packers, 60-65 percent by

TABLE 15. — Number of U. S. Meat Packing Firms Feeding Cattle and Calves and Percentage of Fed Cattle Marketings Consisting of Packer Fed Animals, 1955-64.

Year	Number of Firms	Percent of Fed Cattle Marketings[1]
1955	161	5.1
1956	157	4.6
1957	151	4.9
1958	176	6.2
1959	157	4.8
1960	165	6.4
1961	206	6.5
1962	215	6.6
1963	211	7.4
1964	190	6.5

[1] Based on marketings of fed cattle from 39 major feeding states.

Source: **Packers and Stockyards Resumé**, AMS, USDA, Washington, D. C., II : 11 (Nov. 26, 1965) Table 5.

TABLE 16. — Percentage of Integrated Cattle Feeding Performed by Major Packers, Retail Food Chains and Other Packers, 1962-63.

Type of Packer	Percent of Integrated Feeding 1962	1963
10 Major Packers[1]	32	35
Retail Food Chains[2]	3	5
Other Packers[3]	65	60
Total	100	100

[1] 8 firms in 1962: 9 firms in 1963.

[2] 2 firms in 1962; 4 firms in 1963.

[3] 197 firms in 1962; 189 firms in 1963.

Source: **Packers and Stockyard Resumé** AMS, USDA, Washington, D. C., II : 11 (Dec. 11, 1964) Table 4.

TABLE 17. — Percentage of Total Cattle and Calves Fed by or for Meat Packers by States in the West and Regions, 1961-64.

State or Region	Percent of Total Packer Feeding 1961	1962	1963	1964
California	26.7	31.9	23.3	19.3
Texas	12.5	10.4	15.9	14.2
Washington	8.9	7.4	6.7	9.8
Arizona	3.2	6.8	6.4	5.8
Idaho	5.4	5.8	6.3	4.9
Colorado	5.2	3.2	5.5	4.6
New Mexico	2.1	2.6	2.8	2.4
Utah	2.0	1.8	1.7	1.6
Montana	2.0	1.5	1.3	1.5
Hawaii	0.6	0.6	0.8	1.4
Oregon	0.5	0.6	0.5	0.6
Nevada	0.9	0.9	N.A.	0.4
12 Western States	70.0	73.5	71.2	66.5
10 North Central States	20.2	17.2	15.9	20.0
United States	100.0	100.0	100.0	100.0

Source: **Packers and Stockyards Resumé** AMS, USDA, Washington, D. C., II : 11 (Dec. 11, 1964) and III : 11 (Nov. 26, 1965).

other packers, and 3-5 percent by retail food chains (Table 16).

Table 14 shows the percentage of total cattle feeding consisting of packer fed cattle. This can be considered a measure of the importance of packer feeding in the respective states' and regions' cattle feeding economies. The importance of packer feeding from the packers' viewpoint is better illustrated by delineating the location of packer feeding activity. This is done by showing the percentage of total packer feeding carried on in individual states and regions. Using total packer feeding each year as 100 percent, Table 17 shows the percentage of packer feeding in each of the western states, the western region and the north central region.

During the years 1961-64, from 65 to 75 percent of total packer feeding was done in the 12 western states, 15-20 percent was carried out in the north central states, and the remaining 10-15 percent in other states. One-fifth to one-third of all packer feeding was done in California and 10 percent to 16 percent was done in Texas. Packer feeding in California and Texas together accounted for about 40 percent of the U. S. total packer fed cattle in 1961-63 and 33 percent in 1964. Washington, Arizona, Idaho and Colorado in the west were other important packer feeding areas, as were Nebraska and Kansas in the north central region.

II. Evaluation of Feedlot Performance Factors

Performance of a firm or industry refers to criteria which measure economic results. In this section the performance factors discussed include utilization of capacity, rate of turnover, and feed use efficiency.

Utilization of Capacity

Feedlot capacity can be under-utilized on an annual basis by having the lot in use throughout the year but less than full, by having the lot empty part of the year, or both. Several factors influence the degree of feedlot capacity utilized at a particular time. Aside from individual firm conditions (operator's health, for example), the major factors are feeder cattle, feed grain and slaughter cattle price relationships. The data on utilization of capacity presented here are for a single point in time, spring 1962. Therfefore the absolute percentage level is not particularly relevant. The relationship of capacity utilization to size of feedlot within a state or region and the comparison between and among states and regions are of greater significance (Table 18).

In most of the western states the percentage of feedlot capacity utilized in the spring of 1962 increased with size of lot. This is in keeping with the accepted view that larger lots have high investment and other cash costs which dictate operating at a high level of capacity.

In California, Texas, and Utah, however, lots of 500-999 head capacity showed lower utilization than lots under 500 head capacity. Although the percentage drop was relatively small for California and Texas, and the Utah data suggest the possibility of sampling error, there may be a logical explanation for this relationship also. Small feedlots typically have some cattle feeding inputs of relatively low cash market value, such as family labor and home-grown roughages. In addition, feed grain and feeder cattle raised by the feedlot operator may appear, at least, to have greater value marketed as finished beef.

Data for Wyoming show lower utilization as feedlot size increases. Wyoming is not an important cattle feeding state; the data may not be representative or some other factors may be involved.

At the regional level, the west showed a higher utilization percentage for each larger lot size. The Plains and Cornbelt regions, however, showed the highest utilization in lots under 500 head capacity and the lowest in lots 500-999 head capacity. This same factor, very high utilization of capacity in small lots, combined with higher proportions of small lots as one progresses eastward, accounted for the highest utilization of total capacity in the Cornbelt and the lowest in the west.

Rate of Turnover

Rate of turnover is measured by dividing annual volume by feedlot capacity. It is, therefore, dependent upon both utilization of lot capacity and the length of the feeding period. Because the latter varies with type of cattle fed, the type and amount of rations and the degree of finish, there is no single figure which represents the optimum rate of turnover. However, with a feeding period of 160 to 180 days, with a minimum allowance for lot cleaning and repairs, turnover could approach two. This might be considered an operational maximum for other than a short term feeding program.

Rate of turnover coefficients were computed for each size category of feedlots in five states for which data were available. These are shown by use of bar charts in Figures 14-18. Colorado data show a consistent increase in rate of turnover as lot size increased, from 0.72 for lots under 500 head to 1.68 for lots 10,000 and over head capacity. Results were similar in Idaho, although only three size categories were available. Data for New Mexico, Utah, and Nevada, while not as consistent, show higher turnover rates for larger capacity lots, although medium size lots in some cases had lower turnover than small lots. The latter three states do not have a large feeding industry, so that single year results might be affected to a greater degree by the operations of a relatively small number of feedlot operators.

Feed Use Efficiency

The most important measures of physical efficiency in cattle feeding are feed conversion ratio (feed consumption per pound of gain) and daily weight gain. The feed conversion ratio is influenced by two factors. One is the type of ration, with "hot" or high concentrate rations generally resulting in a lower number of pounds of feed fed per pound of gain. The other is the efficiency of the animals in converting feed to meat. Weight gain, in turn, is determined by the feed conversion ratio and the total feed intake.

With the three variables, type of ration, amount of ration, and feed conversion efficiency, present in every feeding program it is impossible to arrive at a single "optimum" feed conversion ratio or average daily gain figure for a particular state or region. The ration fed depends upon physical availability and price relationships among feeds. Total feed intake is usually a function of the animals' capacity, since cattle on full feed are typically fed all they will consume. Feed conversion efficiency, like total feed intake, is primarily determined by the genetic background of the animals, although environmental conditions undoubtedly can make either positive or negative contributions.

Data on daily feed consumption per animal, feed consumption per pound of gain, and daily weight gain are shown for seven states in Table 19. Total feed consumption ranged from 20 to 25 pounds per

TABLE 18. — Percentage of Feedlot Capacity Utilized, by Size of Lot, and State or Region, Spring 1962[1].

State or Region	Size (Number of Head Capacity) 0-499	500-999	1,000 & over	All Sizes
	(percent of capacity utilized)			
California	38	30	57	56
Colorado	59	63	68	65
Arizona	51	61	77	76
Texas	25	23	71	59
New Mexico	40	48	60	58
Idaho	43	52	55	51
Utah	56	13	54	53
Nevada	24	41	41	41
Washington	42	58	66	60
Oregon	40	52	59	52
Montana	40	45	45	43
Wyoming	47	37	35	40
West[2]	48	53	61	59
Plains[3]	99	47	57	69
Cornbelt[4]	90	69	71	85
3 Regions[5]	82	54	60	66

[1] Computed by dividing number on feed at time of survey by number which could be handled at one time with present facilities.

[2] Includes all of individual states shown above except Texas (11 states).

[3] Includes North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Texas (6 states).

[4] Includes Ohio, Indiana, Illinois, Iowa, Missouri (5 states).

[5] Includes West, Plains and Cornbelt (22 states).

Source: Unpublished ERS, USDA data.

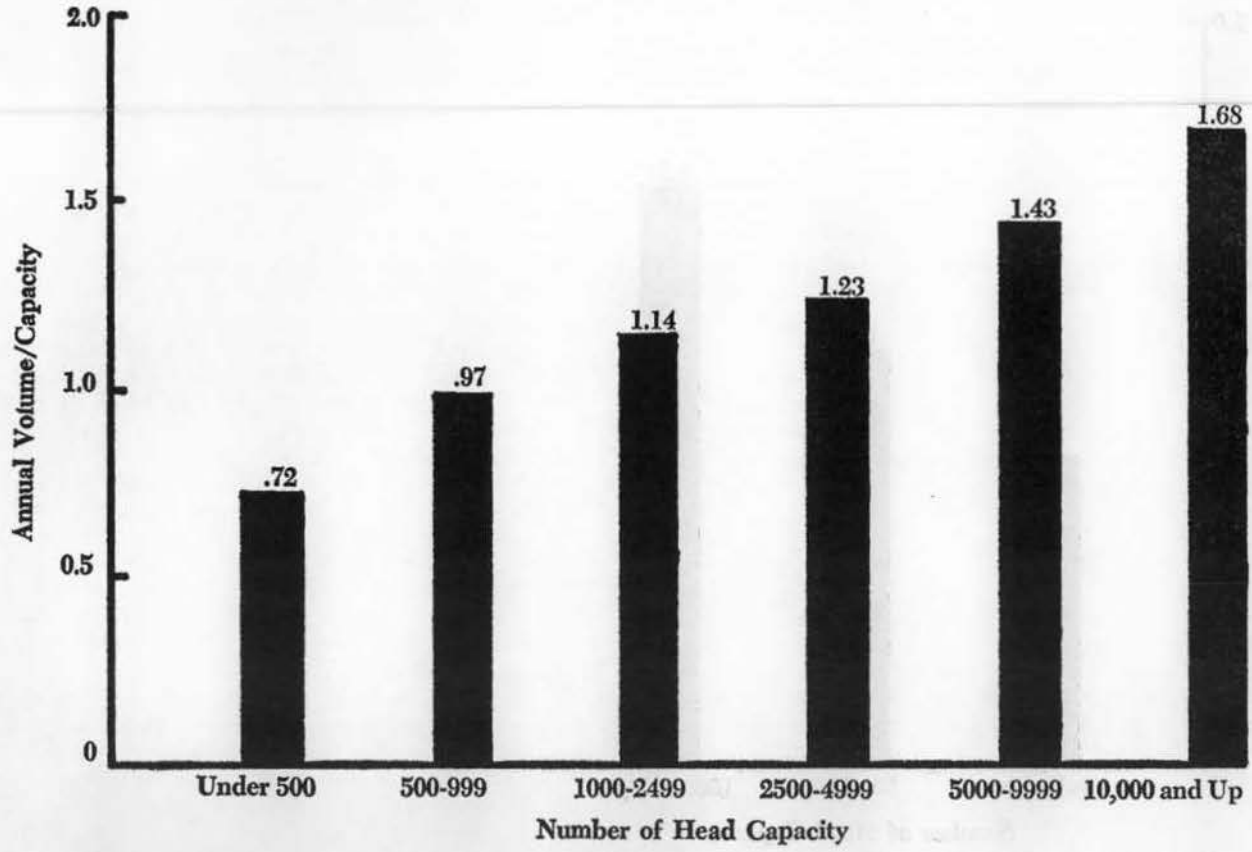


Figure 14.—Feedlot Utilization or Rate of Turnover, Colorado, 1964.

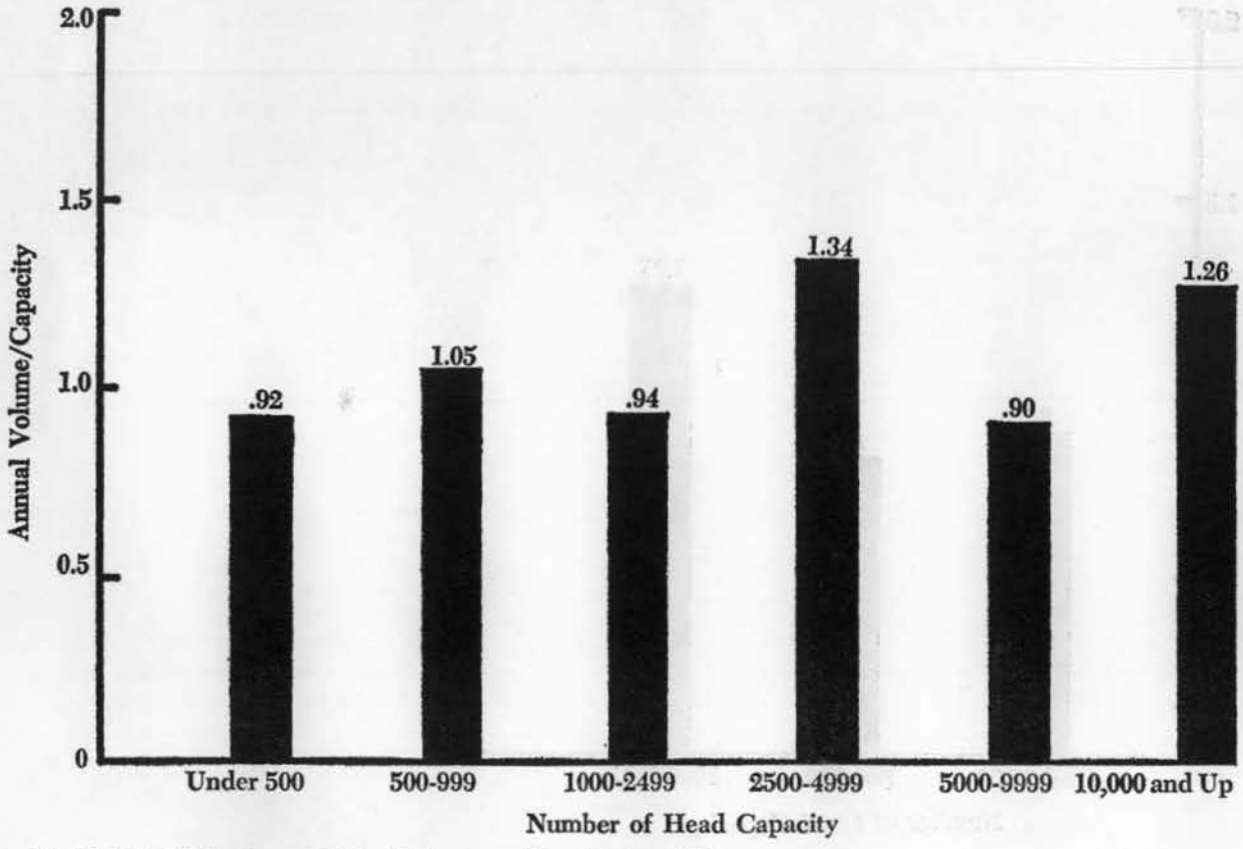


Figure 15.—Feedlot Utilization or Rate of Turnover, New Mexico, 1963.

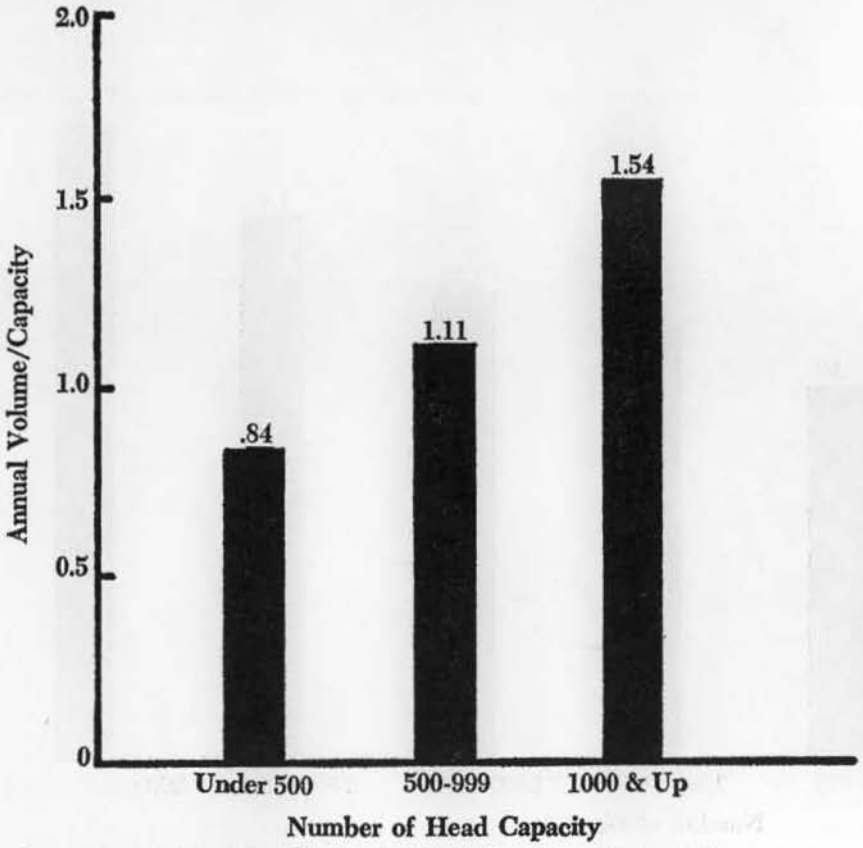


Figure 16.—Feedlot Utilization or Rate of Turnover, Idaho, 1959.

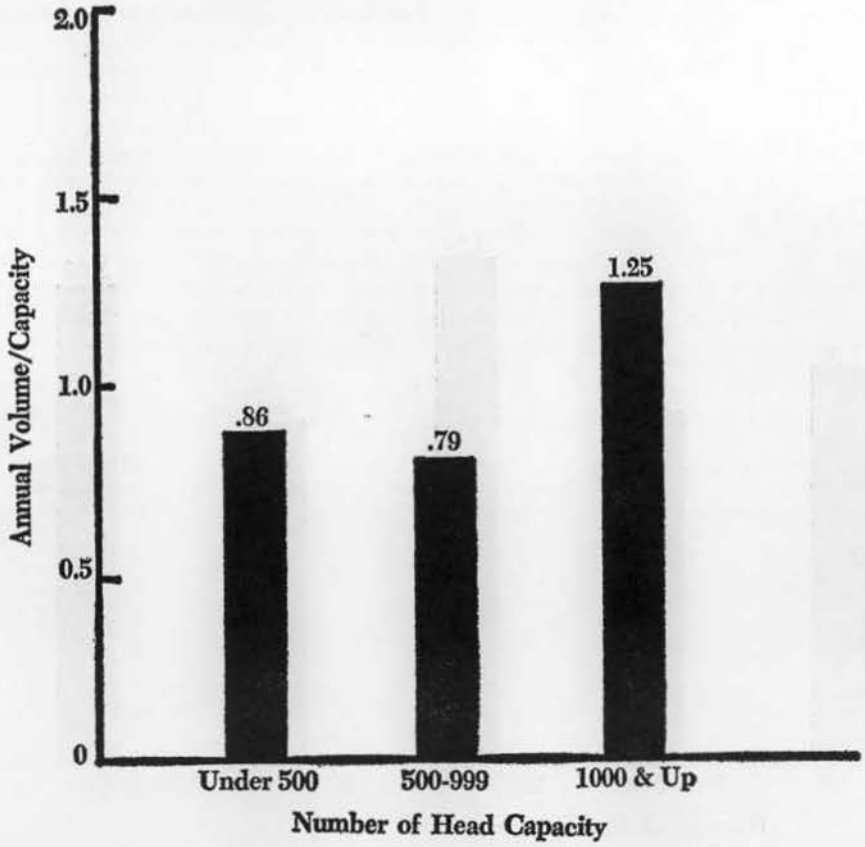


Figure 17.—Feedlot Utilization or Rate of Turnover, Utah, 1964.

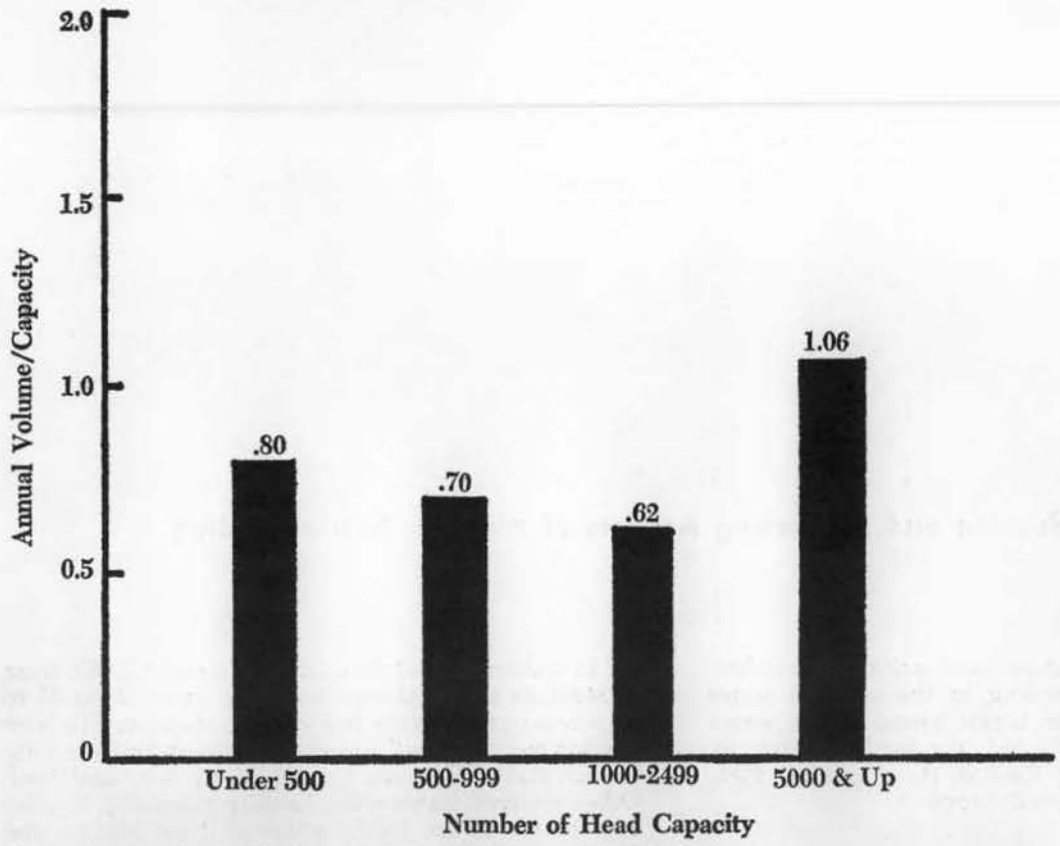


Figure 18.—Feedlot Utilization or Rate of Turnover, Nevada, 1962.

animal a day on full feed. Considering the variety of rations and classes of animals fed in the several states, these figures appear quite consistent. Idaho, with 25 pounds fed per day, is an area which utilizes high roughage rations, particularly in years of plentiful hay supply. On the other hand, Hawaii's daily consumption of less than 20 pounds reflects low roughage rations, due to a severe shortage of roughages in the Islands.

Feed consumption per pound of gain was 8 to 9 pounds in the major feeding states of California, Colorado, and Arizona. New Mexico, Idaho, and Nevada showed 10 to 11 pounds fed per pound of gain. The higher figures for the latter states are probably due more to the type of feeding program, high roughage rations and "warm-up" feeding, than to differences in the gaining ability of the cattle. The very low feed conversion figure of 6.3 in Hawaii was probably due to the very high concentrate rations fed.

Daily weight gain was between 2.2 and 2.8 pounds per day in California, Colorado, and Arizona. The highest daily gain, 2.8 pounds, was in Arizona where a 20 percent roughage ration was reported. Daily gains in the states with higher feed conversion ratios (New Mexico, Idaho, and Nevada) were 2.1-2.2 pounds. Hawaii again was unique in showing a daily gain of 3 pounds, reflecting the very low feed conversion ratio.

TABLE 19. — Efficiency of Feed Use in Cattle Feeding, Western States, 1961-1965.

State	Year	Total Feed Consumption on Full Feed. All Classes (pounds per animal day)	Feed Consumption per Pound Gain, All Classes (pounds per pound of gain)	Weight Gain All Classes (pounds per day)
California	1963	22.0	8.8	2.5
Colorado[1]	1961-63	19.8	8.9	2.2
Arizona[2]	1965	23.0	8.1	2.8
New Mexico	1963	22.4	10.2	2.2
Idaho	1961-62	25.1	11.4	2.2
Nevada[3]	1962	20.5	9.7	2.1
Hawaii	1965	19.2	6.3	3.0

[1] Daily feed consumption by classes: steer calves, 16.6 lb.; heifer calves,15.2 lb.; yearling steers, 22.3 lb.; yearling heifers, 21.5 lb.

Feed consumption per pound of gain by classes: steer calves, 8.2 lb.; heifer calves, 9.5 lb.; yearling steers, 8.7 lb.; yearling heifers, 9.4 lb.

[2] Includes steers (89%) and heifers (11%) on 20% roughage ration.

[3] Of total number of cattle fed, 51% were "warmed-up", 49% were finished.

Source: **Western Livestock Marketing Research Committee.**

III. Production and Marketing Aspects of Western Cattle Feeding

Factors considered under production and marketing aspects of cattle feeding in the western states were grouped into three major areas. These were: type and source of cattle fed, the feeding program, and fed cattle marketing. Each of these areas, in turn, contains several more specific topics.

Type and Source of Cattle Fed

Included in this section is information on class, breed, grade, geographic source, market source, and method of transporting feeder cattle in western states' feeding operations.

Class

Forty to eighty percent of the cattle fed in the western states in the early 1960's were yearling steers. Yearling heifers were the second most prevalent class fed, although calves were fed in larger numbers than heifers in New Mexico and Hawaii, and in equal numbers in Arizona and Idaho (Table 20).

All states except Arizona reported a higher proportion of steers fed in 1951-53, as compared to a decade later (Table 21). This is true even when steers and heifers only are considered in the latter period. (See Table 20.)

The feeding of female animals varies with the stage of the cattle cycle. More heifers and cows are fed when the cattle population is static or declining than during build up in numbers. This may account for the lower percentage of heifers fed in 1951-53.

The incidence of calf feeding in the 1960's may indicate a shift toward placing younger animals in western feedlots.

Breed

Western feedlots, particularly those in the southwest and California, are stocked with feeder cattle of mixed and non-English breeds to a considerable extent. Table 22 indicates that one-fourth of the cattle fed in California and Arizona in the early 1960's were of Mexican and Brahman breeding. In addition 35 to 40 percent of the cattle fed in these states and in New Mexico were "Okies." These are cattle from the southeastern states, of mixed lineage, both dairy and beef. Other western states were feeding primarily English beef breeds in the 1960's, although New Mexico and Utah reported a considerable proportion of dairy stock being fed (Table 22).

The most noticeable change in breed of cattle fed in the 1960's from a decade earlier was a reduction of English beef breeds in California and Arizona and an increase in "Okies" or mixed breeds in these two states and in Brahmans in California. Table 23 shows the breeds of cattle fed in 1951-53.

Grade

The most prevalent grade of feeder cattle on feed in the western states in the early part of the 1960 decade was U. S. Good. Choice grade was second in importance in all states except Hawaii, where Choice ranked first and Good second. Arizona differed from other western states reporting; in Arizona nearly one-half of the feeder cattle were Medium grade, one-fourth Good and one-fourth Choice. Prime and grades below Good, except as noted above, were of relatively minor importance (Table 24).

The data on the grade of feeder cattle fed is consistent with the typical goal of finishing cattle to a slaughter grade of high Good to low Choice and the ability to maintain or increase one grade from feeder to finished animal.

Geographic Source of Feeder Cattle

The three major feeding states in the west imported a majority of the cattle fed from other states in the early 1960's. California depended upon the southwest area for 60 percent of its imports; 25 percent came from the intermountain and northwest states. Other cattle fed originated in the Plains and southeast states, Mexico, and California.

TABLE 20. — Classes of Cattle Fed, Western States, 1960-1965.

State	Year	Calves	Yrg. St.	Yrg. H.	Other
			(percent of total annual volume)		
California[1]	1963				
Colorado	1964	17	45	38	
Arizona	1964	10	80	10	
Texas[2]	1965	33	67		
New Mexico	1963	44	40	16	
Idaho	1960-62	25	47	26	2
Utah	1964	8	53	36	3
Nevada[3]	1962		67	33	
Washington	1964		78	20	2
Oregon	1962	14	58	24	4
Hawaii	1965	57	38	5	

[1] Data on weight basis: 400-599 lb., 33%; 600-799 lb. 59%; 800 & up lb., 8%.

[2] Percentage shown for yearling steers includes yearling heifers.

[3] Of total number fed, 51% was "warm-up"; 49% was finished; steer and heifer calves are included with yearling steers & heifers respectively.

Source: Western Livestock Marketing Research Committee.

TABLE 21. — Percentage of Steers and Heifers in Feedlots, Western States, 1951-53.

State	Steers	Heifers
	(percent of total steers and heifers)	
California	84	16
Colorado	62	38
Arizona	73	27
New Mexico[1]	83	17
Idaho[2]	81	19
Utah[2]	68	32
Nevada	74	26
Montana	68	32
Wyoming	72	28
9 States	75	25

[1] Data for 1952-53 only.

[2] Data for 1951-52 only.

Source: Nevada Bulletin No. 190, Tables 4 and 5.

TABLE 22.—Breeds of Cattle, Fed, Western States, 1963-65.

State	Year	English & Crosses	Mexican & Brahman	"Okies"	Dairy & Crosses
			(percent of total annual volume)		
California[1]	1963	30	26	40	4
Colorado	1964	94	3		3
Arizona	1964	36	27	37	
New Mexico	1963	34		36	30
Utah	1964	81			19
Washington	1964	100			
Oregon	1965	95			5
Montana	1964	93			7
Hawaii	1965	98			2

[1] Small feeders (0-4000) fed more English breeds (60%), fewer Mexican and Brahmas (10%) & fewer "Okies" (28%).

Source: Western Livestock Marketing Research Committee.

TABLE 23. — Percent of All Cattle in Feedlots of Each Breed, Western States, 1951-53.

State	English Beef Breeds	Brahman and Crosses	Mixed [1]	Dairy
	(percent of each breed)			
California	80	12	8	
Colorado	99		1	
Arizona	52	36	12	
Idaho [2]	97	1		2
Utah [2]	96		1	3
Nevada	97	1	1	1
Montana	100			
Wyoming	98		2	
8 States	84	10	6	

[1] Includes some cattle from Old Mexico.

[2] Data for 1951-52 only.

Source: Nevada Bulletin No. 190, Table 11.

TABLE 24.—Grades of Feeder Cattle Fed, Western States, 1960-65.

State	Year	Fancy	Choice	Good	Medium	Common and Inferior
		(percent of total annual volume)				
Arizona	1964		27	22	46	5
New Mexico	1963		16	81	3	
Idaho	1960-62		25	47	20	8
Utah	1964	1	40	47	12	
Washington	1964	8	38	45	9	
Oregon	1965	3	42	45	10	
Hawaii	1965	10	60	25	5	

Source: Western Livestock Marketing Research Committee.

Forty percent of the cattle fed in Colorado were of instate origin. Texas and New Mexico provided 30 percent and the Plains states 20 percent. Two-thirds of the cattle fed in Arizona came from other southwest areas, primarily Texas; 20 percent were from within the state. In all other western states the majority (75-100 percent) of the cattle fed came from within the respective states (Table 25).

Interstate movement of feeder cattle is quite fluid, with inshipments and outshipments occurring in each state. For a more complete analysis of cattle movement in the western region the reader is referred to an earlier Western Livestock Marketing Research Committee publication, **Shifts in the Production and Marketing of Western Stocker-Feeder Cattle,** Washington Agricultural Experiment Station Bulletin 667, November 1965. Data presented in this publication show that, in 1962, California, Colorado, Arizona and Washington were net importers of stocker-feeder cattle, while all other western states were net exporters. This is in substantial agreement with the feeder cattle source figures shown in Table 25.

Market Source of Feeder Cattle

Direct purchases and auctions have been used extensively for several decades by western feedlot operators in procurement of feeder cattle. These sources, plus order buyers, constituted the main market sources for feeder cattle in the 1962-64 period. Although there was variation among states in the percentage of feeder cattle procured from each source, the three listed above accounted for 90 percent or more of the cattle fed in all of the larger volume feeding states. Exceptions were found in Utah, Nevada, and Hawaii, where one-fifth to one-third of the cattle fed were raised by the feedlot operator (Table 26).

However, the relative importance of direct purchase, order buyers, auctions, and terminals changed between 1951-53 and 1962-64. Most states showed an increase in the proportion of feeder cattle procured through auctions in the latter period and decreases in the proportions purchased direct, through order buyers and through terminals. Data for the earlier period are shown in Table 27.

Results of a 1961 ERS, USDA survey of cattle feeders show the same relative shift in feeder cattle market sources in the western region over the 1950 decade. In this survey, "dealers" are defined to include the same source as order buyers in the earlier study (Table 28). The extent of contract or advance purchase of feeder cattle was nearly identical in 1951-

TABLE 25.—Geographic Source of Feeder Cattle Fed, Western States, 1958-65.

State	Year	Supply Areas: Calif. (1)	Colo. (2)	Ariz. (3)	Texas N. Mex. (4)	Ida. Utah Nev. (5)	Wash. Ore. (6)	Mont. Wyo. (7)	Ha. (8)	Plains States[1]	S. E. States	Mex.	Other or Unidentified
		(percent from each area)											
California[2]	1960-63		1	16	44	14	10	1		4			10[3]
Colorado	1963-64		41		29	1		7		19			3
Arizona	1964			20	66						7	7	
New Mexico	1963				75						6		19[4]
Idaho	1958-62					82							18[5]
Utah	1964					94							6
Nevada[6]	1962	16				71							13[5]
Washington	1964					3	84	13					
Oregon	1965					12	85						3
Montana	1965							100					
Hawaii[7]	1965								100				

[1] Nebraska, Kansas and Oklahoma.
[2] Supply sources derived from all in-shipments of stocker and feeder cattle.
[3] Includes cattle from California, southern Plains, Southeast and Mexico.
[4] Primarily from adjacent states.
[5] Includes some cattle from other states in sub-region (5).
[6] Of total number fed, 51 percent was "warm-up" operations;49 percent was finished.
[7] Source by Islands: Hawaii 70 percent, Maui 11 percent, Oahu 9 percent, Kauai 3 percent, Molokai 2 percent.

Source: Western Livestock Marketing Research Committee.

52 and 1961, 21 percent and 20 percent respectively.*

The degree of contracting of feeder cattle varies with prices, with cattle feeders doing more advance buying when feeder prices are expected to increase. This situation existed in both 1951 and 1961. With falling prices, contracting is less attractive to feedlot operators. In 1952-53, with such a situation existing, only 13 percent of the feeder cattle were bought in advance in the western region. **The same relative result could be expected for price declining periods in the 1960's.

It should be pointed out that the 5 to 7 percent of feeder cattle reported purchased through terminals in individual states (Table 26) and the western region (Table 28) in the early 1960's may be subject to question. The only terminal facilities operating as private treaty markets throughout this time period were Denver and Ogden. These facilities were selling by competitive bid or auction as well as through commission agents. Use of the word "terminal" in these cases may, therefore, refer to the physical facility rather than the method of sale, since several of the former terminal market facilities in the west are now operated as auctions.

Table 28 also shows the market source of feeder cattle purchases by the three major feeding regions in the U. S. in 1961. Comparing these regions, West Plains, and Cornbelt, reveals that direct and contract purchasing of feeder cattle were less prevalent as one moved eastward. Terminal markets and raising of feeder cattle were more important sources as one moved eastward. Auction and dealer sources did not show such geographic patterns, but rather revealed quite similar importance in all regions. Auctions accounted for 24 to 34 percent of total feeder cattle procurements; 4 to 16 percent came from dealers.

Examination of data for individual western states from the ERS, USDA study did not indicate any pattern by size of feedlot among states in market sources for feeder cattle.

Method of Transporting Feeder Cattle

Nearly all western states reported 90 to 100 percent of feeder cattle placed on feed were delivered by truck. This, of course, does not preclude rail shipment for earlier stages in the movement of feeder cattle. Data for California show 73 percent of all cattle shipped into the state in 1962 moved by truck. An earlier Western Regional Research publication (Washington State University Bulletin 667) reported 74 percent of beef cattle transported in the 12 western states (including Texas) moved by truck and 26 percent by rail.

Hawaii reported that, in addition to truck movement, 70 percent of the feeder cattle were moved by barge from the outer islands to Oahu.

The Feeding Program

Items included in this section include length of feeding period, weight gains, rations fed, and sources of feedstuffs.

Length of Feeding Period

The length of the feeding period depends upon several factors, including type of ration fed, age of animals on feed, and degree of finish at the time of

* 1951-52 Figure is from Nevada Bulletin No. 190, Table 15

** Nevada Bulletin N. 190, Table 15.

TABLE 26. — Market Source of Feeder Cattle, Western States, 1958-1965.

State	Year	Direct	Order Buyer	Auction	Terminal	Raised	Other
		(percent of total cattle fed procured from each source)					
Calif.[1]	1962-63	40	14	41	5		
Colo.[2]	1963-64	18	53	27		2	
Ariz.	1964	10	75	10		5	
N. Mex.[3]	1963	17	56	18		9	
Idaho[4]	1958-62	51		44		5	
Utah	1964	16	20	22	7	35	
Nev.[5]	1962	52	8	11		24	5
Wash.	1964	49	19	14	7	11	
Hawaii[6]	1965	6				18	76

[1] "Direct" includes own ranch (raised); "direct" was higher for smaller lots, "order buyer" was higher for larger lots.
[2] "Order buyer" may include terminal market purchases; no feeder cattle were raised by lots of 2,500 & up head.
[3] Of the cattle purchased through "order buyers" 60% were procured through auctions, 32% direct & 8% "other & unknown."
[4] "Direct" includes "order buyer"; small feeders procured about 80% of feeder cattle through auctions.
[5] Of total number fed, 51% was "warm-up" operations, 49% was finished.
[6] "Other" consists of cattle fed on contract.

Source: Western Livestock Marketing Research Committee.

TABLE 27. — Source of Feeder Cattle by Market Channel, Western States, 1951-53.

State	Direct	Order Buyer	Auction	Terminal	Raised	Other
	(percent from each source)					
California	42	32	7	8	10	1
Colorado	28	31	14	21	6	*
Arizona	41	23	8	20	7	1
New Mexico	39	*	44	8	9	*
Idaho[1]	35	2	48	*	14	1
Utah[1]	29	2	38	19	12	*
Nevada	48	1	4	1	45	1
Montana	23	*	33	11	33	*
Wyoming	39	7	35	4	15	*
9 States	37	26	13	13	10	1

* Less than 0.5%.
[1] Data for 1951-52 only.

Source: Nevada Bulletin No. 190, Table 14.

TABLE 28. — Market Source of Feeder Cattle Purchases, by Regions, 1961.

Region	Direct	Contract	Dealer	Auction	Terminal	Raised
				(percent from each source)		
West[1]	31	20	8	27	6	8
Plains[2]	20	16	4	34	14	12
Cornbelt[3]	17	8	16	24	18	17

[1] Eleven western states (does not include Texas or Hawaii).
[2] North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Texas (6 states).
[3] Ohio, Indiana, Illinois, Iowa, Missouri (5 states).

Source: Unpublished ERS, USDA data.

TABLE 29. — Length of Feeding Period, by Class, Western States, 1961-1965.

State	Year	Steer Calves	Heifer Calves	Yrg. Steers	Yrg. Heifers	Cows	Bulls	All Classes
		(average number of days on feed)						
Calif.[1]	1963							152
Colo.	1961-63	320	323	169	155			
Ariz.[2]	1964-65	210	180	152	148			
N. Mex.	1963	174	152	143	134			
Idaho	1961-62	226	217	158	136	82	73	
Utah	1964	158	172	158	161	80		
Nev.[3]	1962			153	146			
Wash.	1962							174
Ore.	1965	250	230	160	110	75		156
Hawaii	1965	130	125	110	116			121

[1] Data on weight basis: 400-599 lb., 181 days; 600-799 lb., 141 days; 800 & up lb., 110 days; all weights, 152 days.

[2] Data for calves include growing period.

[3] Of total number fed, 51% was "warm-up" operations, 49 % was finished; steer & heifer calves are included with yearling steers & heifers respectively.

Source: Western Livestock Marketing Research Committee.

sale. During the 1961-65 period most of the western states reported overall average feeding periods of 150 to 160 days. Washington reported 174 days and Hawaii 121 days (Table 29).

Yearling steers were typically fed 145 to 170 days and yearling heifers 135 to 160 days, or about 10 days less. Calves were fed longer than yearlings, with some reported on feed for as long as 300 days. However, in many cases a growing period, on less than full feed, was included in the calf data. In most cases steer calves were fed somewhat longer than heifer calves. States reporting data for cows and bulls showed feeding periods of 75 to 80 days.

Time on feed for all classes of cattle was much shorter in Hawaii than in the mainland states. This is probably a reflection of Hawaii's roughage supply shortage and consequent high energy rations.

Length of feeding period in eight western states in 1951-53 averaged 127 days for both steers and heifers (Table 30). This average was weighted by the number on feed in each state. California and Arizona, two of the three largest volume states, plus Nevada had relatively short feeding programs, which reduced the eight state average. The length of time on feed in California, Arizona, and Nevada was 110 to 120 days for steers and 100 to 110 days for heifers.

The five other western states reporting showed steers being fed about 160 days and heifers 150 days. For the region overall, these figures are very close to those reported for the 1961-65 period.

The shorter feeding period in California, Arizona, and Nevada was attributed to feeding of older cattle, feeding more low grade feeder cattle not justifying a long period on feed, following a more intensive feeding program, and feeding cattle previously warmed up in states farther to the east.*

* **Nevada Bulletin No. 190, Page 33.**

Weight Gains

As was pointed out in the earlier discussion on feed use efficiency, daily gain in weight of cattle on feed depends upon both the amount of feed and the efficiency with which the animals convert the feed into meat. These factors are determined by management, animal genetics, and environment. Therefore, data on average gains for all classes of cattle fed in many feedlots over largegeographic areas have limited usefulness. Using daily gain figures by classes of animals in individual states reduces some of the averaging effect. It still, however, averages the various feeding programs and other management variables that exist when data from many feedlots are combined. Weight gain data are presented with a cognizance of these limitations.

Overall daily weight gain, for all classes of cattle fed, was 2.0 to 2.2 pounds in six of the ten western states reporting during the 1961-65 period. California, Arizona, and Oregon reported gains of 2.5 to 2.8 pounds daily; Hawaii showed 3.0 pounds per day gain (Tables 19 and 31).

Among classes, all states showed yearling steers with higher average gains than yearling heifers. Sim-

TABLE 30.—Length of Feeding Period, Steers and Heifers, Western States, 1951-53.

State	Steers	Heifers
	(average number of days in feedlot)	
California	112	104
Colorado	160	147
Arizona	109	110
Idaho[1]	147	141
Utah[1]	164	142
Nevada	118	109
Montana	144	128
Wyoming	182	175
8 States	127	127

[1] Data for 1951-52 only.

Source: Nevada Bulletin No. 190, Tables 4 and 5.

TABLE 31. — Weight Gain on Full Feed, by Class, Western States, 1961-1965.

State	Year	Steer Calves	Heifer Calves	Yrg. Steers	Yrg. Heifers	Cows	Bulls	All Classes
		(Average daily gain in lb.)						
Calif[1]	1963							2.5
Colorado	1961-63	2.04	1.60	2.57	2.28			2.2
Arizona[2]	1964-65	2.56		2.90	2.35			2.8
N. Mexico	1963	2.10	2.16	2.37	2.25			2.2
Idaho	1961-63	2.03	1.92	2.42	2.11	2.05	2.79	2.2
Utah	1964	2.27	2.25	2.15	2.06	2.54		2.1
Nevada[3]	1962			2.18	2.05			2.1
Washington	1962							2.0
Oregon	1965	2.25	2.00	2.75	2.50			2.6
Hawaii	1965	3.08	2.82	3.18	2.43			3.0

[1] Data on weight basis: 400-599 lb., 2.39 lb. per day; 600-799 lb., 2.68 lb. per day; 800 & up lb., 2.64 lb. per day. Data on breed basis: English and crosses, 2.44 lb. per day; Mexican, 2.17 lb. per day; "Okie", 2.45 lb. per day; Brahma crosses, 2.33 lb. per day; Dairy, 2.52 lb. per day.

[2] Data for calves include growing period.

[3] Average gain for all "warm-up" cattle (51% of total number fed) was 1.46 lb. per day, for all finished cattle (49% of total number fed) was 2.79 lb. per day.

Source: Western Livestock Marketing Research Committee.

ilarly, steer calves gained faster than heifer calves in all states except New Mexico, where the difference was small. With two exceptions yearling cattle outgained calves. The exceptions were Utah, where calves gained 0.1 to 0.2 pounds per day more than yearlings, and Hawaii, where steers of both ages showed greater daily gains than heifer calves and yearlings. Data from Idaho and Utah showed cows and bulls gaining 2.0 to 2.8 pounds daily.

Data for 1951-53 show almost identical weight gain for steers and heifers in the western region. Nine-state averages were 2.17 pounds per day for steers and 2.15 pounds per day for heifers, with a range among the states of 1.9 to 2.2 pounds for both classes (Table 32).

Comparison of 1951-53 daily weight gains with 1961-65 figures indicates that cattle were gaining somewhat faster in the 1960's in all seven states where data were available for the two periods. The increase was about 0.3 pounds per day in California and about 0.6 pounds per day in Arizona. Both of these states reported short feeding periods in 1951-53. With other things equal, this would have the tendency to hold gain down. These two states also reported very high gains in the 1960 period, which in part at least, were due to intensive feeding programs. Increases in the other five states were 0.1 to 0.2 pounds per day.

Rations Fed

Barley and grain sorghum or milo comprised the major feed grains utilized in cattle finishing rations in the western states in 1961-65. Texas, New Mexico, and Arizona depended primarily on milo; Colorado fed milo and corn; California used barley and milo. The other western states used barley as the basic feed grain (Table 33).

Alfalfa hay and corn or other silage were used for roughage, with the proportions differing among states. Colorado, Washington, and Wyoming reported silage comprising two-thirds or more of the total roughage fed, by weight.

Among states, the proportion of roughage fed varied from 15 to 60 percent. California, Arizona, and Montana reported 20 percent or less of the total ration as being roughage. Colorado, Nevada, and Washington showed 50 to 60 percent roughage in their feedlot ration.

Similarly, the percentage of grain fed ranged from 20 to 68 percent. Rations in Colorado, Nevada, Washington, and Wyoming contained less than one-third grain. California, Arizona, Oregon and Montana fed 58 to 68 percent grain. Texas and New Mexico reported larger lots feeding 65 percent or more concentrates.

Western cattle feeders used feedstuffs available as by-products of the agriculture in their particular areas. These included sugar beet pulp and molasses, citrus pulp, cottonseed and almond hulls, potatoes

TABLE 32.—Average Daily Gains in Feedlots, Steers and Heifers, Western States, 1952-53.

State	Steers	Heifers
	(average rate of gain in pounds)	
California	2.21	2.13
Colorado	2.10	2.20
Arizona	2.17	2.13
New Mexico	2.12	2.20
Idaho[1]	2.16	1.87
Utah[1]	1.94	2.00
Nevada	1.93	1.96
Montana	2.17	2.21
Wyoming	2.20	2.10
9 States	2.17	2.15

[1] Data are for 1951-52.

Source: Nevada Bulletin No. 190, Table 10.

TABLE 33. — Composition of Feedlot Rations, Western States, 1961-1965.

State	Year	Roughages				Grains						
		Hay	Silage	Other	Total Roughage	Barley	Corn	Milo	Other	Total Grain	Protein Supplement	All Other
		(Percent of total ration by weight)										
California[1]	1963	12	1	2	15	44	2	15		58	4	23
Colorado	1961-63	15	44		59		17	16		33	4	4
Arizona[2]	1965	6		14	20	27		41		68	5	7
Texas[3]	1965											
New Mexico[4]	1963	25	20		45	4	1	45		50	5	
Idaho[5]	1961-62	28	12		40	26	4	2	7	39	2	19
Utah[6]	1964											
Nevada[7]	1962	49	7		56	20				20		24
Washington	1962	16	38		54		9		18	27		19
Oregon	1964					56	3		4	63	6	31
Montana[8]	1965	12	8		20	60				60	8	12
Wyoming	1963	12	26		38					32	3	27

[1] Percentages of total feed supply in state; 70% of "all other" is beet pulp and molasses.

[2] Roughage includes 14% cottonseed hulls; most of "all other" is molasses.

[3] No data, but rations tend to be low in roughages, with larger lots particularly feeding milo up to 75-90% of total ration.

[4] For commercial lots a 65% concentrate ration is considered more typical.

[5] Wheat in mixtures comprises 7% of grains fed; "all other" is two-thirds beet pulp and molasses, one-third potatoes.

[6] No breakdown of total ration; roughage is about equal amounts of hay and silage; grain is 77% barley; beet pulp is primarily "all other" feedstuff.

[7] Rations based on 51% of total cattle fed as "warm-up" and 49% finished.

[8] "All other" is beet pulp.

Source: Western Livestock Marketing Research Committee.

and, in Hawaii, pineapple hay and bran and sugar cane strippings and molasses.

Two to 8 percent of the ration was typically made up of commercial protein supplement, with 4 or 5 percent most common.

Source of Feedstuffs

In five of the six states reporting, 70 percent or more of the hay and silage used in cattle feeding in the early 1960's was purchased rather than grown. These five states included California, Colorado, Arizona, Idaho, and Montana. Utah, on the other hand, reported feedlot operators growing 88 percent of the hay fed and 96 percent of the silage used (Table 34).

More than three-fourths of the feed grain used in cattle feeding was purchased also. The exceptions were Colorado and Utah where 60 percent of the barley fed in these two states and 73 percent of the corn fed in Utah was grown by the feeding firm. Most feed grain was purchased in-state except for corn and milo in California and corn in Colorado, of which 50 to 65 percent was imported, and milo in Idaho and Utah, of which more than 90 percent was shipped in.

However, data may not reflect the complete extent of feed grain usage from out-of-state sources. If the cattle feeder purchased grain from a commercial dealer within his respective state he may not have known the origin of the grain.

Small feeders generally use home-grown feeds to a greater extent than operators of large feedlots. In California, lots under 1,000 head capacity produced 60 percent of their feed requirements; lots of 1,000 to 5,000 head capacity produced 55 percent of feed requirements; lots over 5,000 head capacity produced 24 percent of the feed needs. Similar findings could be expected in other western states.

Fed Cattle Marketing

Topics included under fed cattle marketing are market outlets, pricing basis, and quality.

Market Outlets for Fed Cattle

The great majority of slaughter cattle in the western states are sold direct to packers, either at the feedlot in the case of larger lots, or at the plant. California, Arizona, New Mexico, Washington, and Hawaii reported 95 to 100 percent of fed cattle sold direct to packers in the early 1960's. Idaho and Nevada reported about 85 percent of the finished cattle sold direct (only half of Nevada's feeding volume was finished cattle, the other 50 percent was warm-up feeding). Colorado, Utah, and Wyoming sold 50 to 60 percent direct. Texas packers procured 43 percent of their finished steer and heifer volume direct in 1959 (Table 35).

Auction markets accounted for a majority of fed cattle sales in only one western state, Montana. No state reported selling as much as one-fourth of its fed cattle volume through terminals. Even the small percentages reported sold through terminals may be open to question, as discussed earlier. Less than 10

TABLE 34. — Source of Feedstuffs Used in Cattle Feeding, Western States, 1961-65.

State	Year	Hay		Silage		Barley			Corn			Milo		
		Grown	Pur.	Grown	Pur.	Grown	Pur. in-state	Imp.	Grown	Pur. in-state	Imp.	Grown	Pur. in-state	Imp.
		(percent of total for each type of feed)												
California[1]	1963		100					13			65			56
Colorado	1961-63	25	75	30	70	60	40		20	30	50		70	30
Arizona[2]	1962		100		100		100						60	40
Texas[3]	1965													
Idaho[4]	1961-62					20	77	3	20	44	36	3	1	96
Utah[5]	1964	88	12	96	4	60	31	9	73	7	20	6	2	92
Washington[6]	1965													
Montana	1965	5	95	10	90		100							
Hawaii[7]	1965													

[1] Lots under 1,000 head capacity produced 60 percent of their feed requirements, lots of 1,000-5,000 head capacity 55 percent, and lots over 5,000 head capacity 24 percent of feed needs; barley was imported from other western states and plains states, milo from plains states.

[2] All molasses fed was imported from California; cottonseed hulls fed were purchased in-state; milo was imported from Texas.

[3] No data, but principal feed grain is milo, produced in the panhandle area and an area near the Gulf coast.

[4] Barley data include mixtures containing wheat and oats; barley was imported from Montana, corn from midwestern states, milo from plains states.

[5] Barley was imported from Idaho and Montana, corn from midwestern states, milo from plains states.

[6] No data, but feedstuffs are primarily locally grown.

[7] Major feedstuffs include pineapple hay, pineapple bran, sugar cane strippings, and sugar cane molasses, all of which are purchased locally.

Source: Western Livestock Marketing Research Committee.

percent of fed cattle sales were sold through outlets other than direct to packers, auctions, and terminals, except in Nevada. In Nevada, 70 percent of the warmed-up cattle went to finishing lots, while most of the remainder went back to grass; both of these categories are included in "other."

The percentage of fed cattle sold direct to packers was up in almost all western states, comparing the 1960's with 1951-53. Only in Montana were direct sales substantially lower in 1962; Utah showed little change. Auction sales were up in Colorado, Utah, Montana, and Wyoming, but down in Idaho and about the same in other states. Terminal sales were down in all states (Table 36).

Regional data indicate 70 percent of the finished cattle in the west were sold direct to packers in 1961. Eight percent were sold through auctions, 15 percent through terminals and the remainder went to feeders and others (Table 37). Except for a larger percentage reported sold through terminals, these data are in agreement with the individual data shown in Table 35. Data by feedlot size from the ERS, USDA study, which is the source of the regional data, show that the proportion of fed cattle sold direct to packers increased as lots became larger, while the percentage sold through auctions and terminals decreased as lot size went up.

A comparison of Western Regional data for 1951-53 (Table 36) and 1961 (Table 37) indicates an increased proportion of fed cattle sold direct and through auctions for the later time period, with a decline in the proportion marketed through terminals.

Table 37 also shows that direct sales were a much less important method of marketing fed cattle as one moved eastward. In contrast, terminals were of greater importance as one moved east, while auctions and other outlets were of about the same importance in all major feeding regions.

Pricing Basis

Eighty to 98 percent of fed cattle in five western mainland states were sold on a liveweight basis in 1962-64. When selling direct, pricing by liveweight typically includes a "pencil" or arbitrary shrinkage of 2 to 6 percent, depending upon time and place of weighing, maturity of the cattle, type of ration fed and local practice. Data on pricing bases for fed cattle sales in 1962-64 are given in Table 38.

Ten percent or less of fed cattle were sold on a carcass grade and yield in the mainland states in the 1960's. In Hawaii, however, all the cattle fed in the very few lots there were sold grade and yield. Even fewer finished cattle were sold on a guaranteed yield basis except in New Mexico, where 21 percent were reported sold with the seller guaranteeing a minimum yield or carcass weight. A very small percentage of fed cattle were sold on a consignment basis, under which the seller realizes the return from the carcass when sold, less processing and marketing charges.

Data from 1951-52 and 1952-53 indicate that carcass grade and yield (or carcass weight and grade) sales were, if anything, less popular in the 1960's than in 1951-53. Table 39 also reveals the tendency of cat-

TABLE 35.—Market Outlet for Fed Cattle Sales, Western States, 1958-65.

State	Year	Direct to Packer	Auction	Terminal	Other
		(Percent of total annual volume)			
California[1]	1963	98			2
Colorado[2]	1964	59	41		
Arizona	1964	98	2		
Texas[3]	1959				
New Mexico[4]	1963	95			5
Idaho	1958-60	85	13	2	
Utah	1964	52	29	10	9
Nevada[5]	1962	49	2		49
Washington[6]	1964	98	2		
Montana	1962	13	78	7	2
Wyoming	1963	51	21	23	5
Hawaii	1965	100			

[1] Sales through auctions were relatively more important for smaller feedlots than for the total of all lots (0.3%, which is included in "other").

[2] For feeders under 500 head annual volume only 29% of cattle were sold direct to packers; auction sales include all organized markets.

[3] Market sources of heifers and steers purchased by Texas packers in 1959 were auctions, 32%; terminals, 25%; feedlots & order buyers, 22%; farmers & ranchers, 21%.

[4] "Other" includes auction, commission buyer, terminal, ranch & feedlot.

[5] Of total number fed, 51% was "warm-up", 49% was finished; "other" includes "finished" & "back to grass" (70% of "warm-up" cattle went to a finisher, 83% of finished cattle went to packers).

[6] Feedlots of 1,000 & up annual volume sold more than 95% of their cattle at the lot.

Source: Western Livestock Marketing Research Committee.

TABLE 36. — Market Outlet for Cattle from Feedlots, Western States, 1951-53.

State	Direct to Packer	Auction	Terminal	Other
	(percent to each market outlet)			
California	91	*	9	*
Colorado	19	1	80	*
Arizona	81	*	12	7
New Mexico	82	6	12	*
Idaho[1]	66	28	4	2
Utah[1]	54	19	22	5
Nevada	76	1	9	14[2]
Montana	60	25	13	2
Wyoming	47	15	25	13
9 States	66	2	30	2

* Less than 0.5%.

[1] Data for 1951-52 only.

[2] Twelve percent went back to grass after sale or under same ownership.

Source: Nevada Bulletin No. 190, Table 16.

TABLE 37. — Outlet for Fed Cattle Marketings, by Regions, 1961.

Region	Direct to Packer	Auction	Terminal	Feeder	Other
	(percent to each market outlet)				
West[1]	71	8	15	4	2
Plains[2]	43	8	43	3	3
Cornbelt[3]	22	9	65	3	1

[1] Eleven western states (does not include Texas).

[2] North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Texas (6 states).

[3] Ohio, Indiana, Illinois, Iowa, Missouri (5 states).

Source: Unpublished ERS, USDA data.

tle feeders to sell less by grade and yield when prices are relatively high, as they were in 1951-52 when only 6 percent of total sales were grade and yield in seven states, as compared to lower price years, such as 1952-53 when 12 percent of the fed cattle were sold grade and yield in the same states.

Sales out of feedlots in advance of delivery are shown in Table 39 for the 1951-53 period. Although amounting to less than 25 percent of total sales in any of six states for either of the two years, the data illustrate another fed cattle marketing practice related to price behavior. Packers are less willing to purchase in advance of delivery in a price declining period than in a price rising period. Advance delivery sales dropped from 12 percent of total sales in the six states in 1951-52, to 5 percent in 1952-53.

Quality of Fed Cattle

Western cattle feeders in the early 1960's generally tried to market their cattle at high Good or low Choice USDA grades. Eight states showed 50 to 70 percent of fed cattle were sold as Choice, 25 to 45 percent graded Good and less than 10 percent were standard or Commercial (except Utah with 17 percent.). Only two states reported any Prime cattle sold; Idaho and Washington each showed 1 percent Prime grade (Table 40).

Some revisions were made in USDA slaughter grade standards during the 1950 decade. In general, these changes lowered requirements necessary for fed cattle and beef carcasses to qualify for a given grade. Therefore, it is not possible to make comparisons regarding absolute quality levels between fed cattle sold in the early 1950's with those sold in the 1960's, using USDA grade designations. To the extent, however, that USDA grades are used as symbols of relative quality levels by consumers, it is possible to use a comparison of grades over time as a means of assessing cattle feeders' position in the market.

Typically, USDA Prime is considered a luxury quality beef, superb in flavor and tenderness, but somewhat overly fat and wasty. USDA Choice is regarded as ideal quality by probably a majority of consumers. Very close to Choice quality, in the opinion of many consumers, is USDA Good. Although perhaps not quite as tender and flavorful as Choice, Good grade beef is considered by many to be adequate in those attributes and superior to Choice in minimizing fat and waste. USDA grades below Good

TABLE 38. — Pricing Basis for Fed Cattle Sales, Western States, 1962-64.

State	Year	Liveweight[1]	Grade and Yield	Yield only	Other
		(percent of total annual volume)			
California	1963	86	8	3	3[2]
Colorado	1964	97			3[3]
Arizona	1964	98	1	1	
New Mexico	1963	79		21	
Utah	1964	90	10		
Hawaii	1962		100		

[1] Direct sale usually includes arbitrary or "pencil" shrink; weights may be taken at the feedlot or at the market.
[2] Consignment sales.
[3] Includes all pricing bases other than liveweight.
Source: Western Livestock Marketing Research Committee.

TABLE 39. — Sales Out of Feedlots in Advance of Delivery and on the Basis of Carcass Weight and Grade, Western States, 1951-52 and 1952-53.

State	Advanced Delivery Sales		Carcass Weight & Grade Sales	
	1951-52	1952-53	1951-52	1952-53
	(percent of total sales)			
California	17	5	7	17
Colorado	3	3	5	3
Arizona	15	9	9	20
New Mexico			10	5
Nevada	1	1	10	13
Montana	6	*	4	3
Wyoming	23	14	2	2
6 States	12	5		
7 States			6	12

* Less than 0.5 percent.
Source: Nevada Bulletin No. 190, Tables 17 and 18.

are generally considered as definitely denoting a lower quality product.

In 1952-53, 5 percent of the steers and heifers marketed out of feedlots in nine western states graded Prime, 69 percent were Choice, 20 percent Good and 6 percent Commercial (Table 41).

Comparison of individual states shows that in all cases where data were available for the two periods, a lower percentage of Prime cattle was sold in the 1960's. In three of five states a smaller proportion of fed cattle were graded Choice in the 1960's. In New Mexico the percentages were the same and in Arizona the percentage of Choice was greater. The proportion of Good grade cattle was greater in three states in the latter period and smaller in two states. Percentage sales of grades below Good were greater in two states in the sixties, smaller in two states and the same in one state.

These comparisons would appear to indicate that western feeders were marketing lower quality cattle in the early 1960's than a decade earlier. However, data for the latter period included calves, cows, and bulls in several states, whereas the 1952-53 figures included heifers and steers only.

If the data for the 1960's were adjusted to include only heifers and steers, it is judged they would very likely show that, while the percentage of Prime grade dropped from 1952-53, 90 percent or more of the fed cattle sold graded Choice and Good in a ratio of two or three to one Choice to Good. This would indicate some relative decline in Choice and increase in Good. Such a result would be consistent with both the indicated recent trend toward broader consumer acceptance of USDA Good and the preference of western consumers for beef with somewhat less finish than is sought in other areas of the U.S.

TABLE 40.—Grades of Fed Cattle Sold, Western States, 1958-65.

State	Year	Prime	Choice	Good	Standard & Common
			(percent of total annual volume)		
California	1963		58	33	9
Arizona	1964		70	25	5
Texas	1965		50	45	5
New Mexico	1963		53	42	5
Idaho	1958-60	1	57	37	5
Utah	1964		54	29	17
Washington	1964	1	67	30	2
Hawaii	1965		53	43	4

Source: Western Livestock Marketing Research Committee.

TABLE 41.—Slaughter Grade of Steers and Heifers Marketed out of Feedlots, Western States, 1952-53.

State	Prime	Choice	Good	Commercial
		(percent of animals in each grade)		
California	1	71	22	6
Colorado	14	78	8	*
Arizona	*	46	37	17
New Mexico	2	55	34	9
Idaho[1]	6	71	19	4
Utah[1]	1	78	19	2
Nevada	*	51	47	2
Montana	*	62	30	8
Wyoming	11	70	17	2
9 States	5	69	20	6

* Less than 0.5 percent.

[1] Data are for 1951-52.

Source: Nevada Bulletin No. 190, Table 12.

IV. Feedlot Costs and Investment

Exclusive of feed and investment in the animals, cost of feeding cattle varies by size of lot, utilization of capacity, and type of equipment employed Typically, both variable or operating cost and investment or fixed cost decreases on a per animal basis as size of lot increases, with a given level of utilization. Also, per animal costs can be expected to decrease as the percentage of capacity utilized goes up, with a given size of lot. Thus, a smaller lot utilized more fully may be more economical than a larger lot operated at a lower percentage of capacity. Size or capacity is critical when building a feedlot; utilization of capacity becomes critical when operating an existing feedlot.

Feedlot equipment can be categorized on the basis of the three basic feedlot operations: feed processing, feed distribution, and manure disposal. Each operation can be performed through use of a number of different levels of technology, from pitchfork and scoop shovel to automatic time controlled mills and auger systems. The most economical system depends upon such factors as size of feedlot and availability and cost of labor. Generally some mechanization is economically feasible in all by the smallest feeding operations. However, the most automatic, labor-free systems may not be the most economical, unless wage rates are very high or labor is unavailable.

TABLE 42.—Non-Feed Cost of Cattle Feeding, by Size of Feedlot, Western States, 1961-64.

State	Year	Number of Head Fed Annually						
		Under 500	500-999	1000-2499	2500-4999	5000-9999	10,000 & up	All Sizes
		(cents per head per day)						
California[1]	1963				12.7	8.7	7.1	7.4
Colorado	1961-64	13.1	8.9	8.9	8.1	7.4	7.5	9.2
New Mexico	1963	8.0	7.2	7.1	6.0	8.8	4.6	7.4
Nevada[2]	1962	12.3	10.0	8.9				9.6
Montana	1962	13.7	11.7					

[1] Data are for annual volumes of under 4,000, 4,000-10,000, and over 10,000 head, respectively.
[2] Data are for "warm-up" operations only.
Source: Western Livestock Marketing Research Committee.

TABLE 43.—Total Investment in Cattle Feedlots, by Size of Lot, Western States, 1961-64.

State	Year	Number of Head and Capacity at One Time							Cost Basis
		Under 500	500-999	1000-2499	2500-4999	5000-9999	10,000 & up	All Sizes	
		(dollars per head capacity)							
California[1]	1963				62.27	50.65	40.94	43.31	1964 replacement, excluding land
Colorado	1961-64	68.73	31.83	36.54	24.80	18.39	13.20	20.22	1963 replacement, excluding land
Texas[2]									
New Mexico	1963	55.27	47.31	48.48	30.00	43.80	34.21	50.42	1963 estimated resale value, including land for feed pens and feeding equipment
Utah	1964							24.62	includes land and buildings, not mills and rolling stock
Nevada[3]	1962	32.64	25.92	22.22	27.96			24.40	includes land for feedlots, pens, milling and feeding equipment, and storage facilities
Montana	1962	21.08	16.51						(not reported)

[1] Data are for capacities of under 4,000, 4,000-9,000 and over 9,000 head capacity, respectively; land replacement value averaged $10.29 per head capacity.
[2] No data, but investment costs are estimated at $15-$60 per head capacity, with some as high as $100. Cost variance is due primarily to amount of concrete flooring, the use of which is dictated by rainfall conditions (1965).
[3] Data include both "warm-up" and finishing lots, weighed by the relative numbers and capacities, except that 2,500-4,999 head capacity figure is for finishing lots of 2,500-12,000 head capacity only.
Source: Western Livestock Marketing Research Committee.

This section enumerates data on operating costs, investment costs, and custom feeding charges in six states in the western region.

Operating Costs

Data on non-feed cost of cattle feeding, while differing somewhat among states, show a quite consistent pattern of decreasing cost with increasing lot size within states. Data for California, Colorado, Nevada, and Montana indicate that non-feed costs for lots under 500 head capacity were 12 to 14 cents per head per day in 1961-64. New Mexico, which reported lower costs for all size groups, recorded 8 cents for the smallest size category. Different accounting procedures may be responsible for some of the differences among states (Table 42).

Daily non-feed costs per animal day in lots of 500-999 head capacity appear to have been 9 to 12 cents. Larger lots showed costs about as follows: 1,000-2,499-head capacity, 9 cents; 2,500-4,999 head capacity, 8 cents; 5,000 and over head capacity, 7 to 8 cents.

Average non-feed costs for all feedlots ranged from 7.4 to 9.6 cents per head daily, among states. This spread resulted to a large degree from the differing size distribution of lots among states.

TABLE 44.—Methods of Charging for Custom Feeding, Western States, 1962-64.

State	Year	Percentage Distribution of Feedlots Charging on Basis of:				Percentage Distribution of Custom-Fed Cattle Charged on Basis of:			
		Feed Consumption	Weight Gain	Yardage	Share Basis	Feed Consumption	Weight Gain	Yardage	Share Basis
		(percent of total feedlots custom feeding)[1]				(percent of total number of cattle custom-fed)[1]			
Colorado	1964	73	24	53		96	13	22	
Arizona	1962	100				100			
New Mexico[2]	1963	57	22	7	14	85	14	0	1
Nevada[3]	1962	36	64			72	28		

[1] Percentages may total to more than 100 percent due to some custom feeders assessing charges on more than one basis.
[2] Charges based on feed consumption include a yardage fee.
[3] Data include both "warm-up" and finishing operations.
Source: Western Livestock Marketing Research Committee.

TABLE 45.—Prevalent Charges and Risk Assessments for Custom Cattle Feeding, Western States, 1962-65.

State	Year	Prevalent or Typical Charge	Method of Assessing Veterinary Costs	Method of Assessing Death Loss	Method of Handling Insurance Coverage
California	1964	2.5c-3.0c per lb. feed, plus 1c-2c yardage per head/day is preferred method; also 17c-20c per lb. gain, depending upon weight.	Cost plus 10%-15% service charge, paid by cattle owner.		2c-16c per head (average 7c) epidemic insurance for measles risk in Imperial Valley.
Colorado	1964	Feed cost, with or without overage, plus 5c per head/day or $1.25 per head/month yardage; also 22c-25c per lb. gain.			
Arizona	1962		Paid by cattle owner.	Assumed by cattle owner.	
Texas	1965	(per ton of feed plus yardage)			
New Mexico	1963		Usually paid by cattle owner, sometimes paid by feedlot operator or shared.	Usually assumed by cattle owner, occasionally shared by feedlot operator.	
Utah	1964	(yardage method preferred, some on per lb. feed)	Usually paid by cattle owner.	Usually assumed by cattle owner.	
Nevada[1]	1962	18c per lb. gain.	Paid by cattle owner.	Assumed by cattle owner unless caused by negligence, then assumed by feedlot operator.	Paid by cattle owner.
Hawaii	1962	90c-98c per day flat rate; 1965: 2c per day yardage plus fixed mark-up on feed.			

[1] Includes both "warm-up" and finishing operations.
Source: Western Livestock Marketing Research Committee.

Investment Costs

Table 43 shows investment costs, in dollars per head capacity, by size of lots for six western states in 1961-64. Since data for several states were computed on different bases, interstate comparisons must be made with caution. Except for the smallest size lots in Colorado, per animal investment costs for lots of a given capacity would appear to have been somewhat higher in California and New Mexico than in Colorado, Utah, Nevada, and Montana. The other characteristic of investment costs which is apparent in Table 43 is decreasing cost per head as lot size goes up.

Custom Feeding Charges

Several methods are used for assessing charges when custom feeding cattle. These include charging on the basis of feed consumed, weight gain, yardage per animal-day or a combination.

In Colorado, Arizona, and New Mexico a majority of custom feeding operators assessed custom feeding charges on the feed consumption basis. From 85 to 100 percent of all custom-fed cattle in these states were charged on this basis in 1962-64. In Nevada one-third of the feedlots that do custom feeding, with 70 percent of the custom fed cattle, used a feed consumption charging formula (Table 44).

One-fourth of the custom feeding lots in Colorado and New Mexico and two-thirds of those in Nevada charged on a weight gain basis. However, this method was used for less than 30 percent of the cattle custom-fed in each of these states.

Half of the operators, feeding 22 percent of the cattle custom-fed in Colorado, charged on a yardage basis. The percentages of feedlots and custom-fed cattle totaled more than 100 percent in some states because more than one method of charging was used by individual feedlots.

Where custom feeding charges were assessed on a feed consumption basis a flat charge was made in some cases, such as 2.5 to 3.0 cents per pound of feed in California in 1964. In other cases charges were made for actual feed cost, with or without an additional fixed markup. In addition, most lots assessed a yardage fee of from 1 to 5 cents per head per day (Table 45).

In custom feeding arrangements the cattle owner usually paid for any medicines and veterinary services administered while the cattle were on feed. Death loss was generally assumed by the owner of the cattle, unless it was the result of negligence on the part of the feedlot operator. When cattle fed on a custom basis were insured, premium cost was borne by the cattle owner also.

Summary

Cattle feeding in the western United States is unique among major feeding areas with respect to the scale of operations, locational patterns, type of cattle and feed fed, and markets used. Large scale commercial feedlots, characterized by dependence upon outside sources of cattle and feed, employment of a high degree of mechanization and technology, and creation of individual slaughter cattle markets, are found in most major western feeding areas. Yet the region is quite heterogeneous in size and type of cattle feeding enterprises. This study was designed to describe and analyze the current organization and structure of the western cattle feeding industry and to indicate changes which have occurred over the past decade. Data sources include the Agricultural Experiment Stations of the 13 western states and the United States Department of Agriculture.

Cattle feeding in the western United States tends to be located in one or several distinct localized areas within each state. These areas are generally determined by irrigation districts and feed supply, with geography, climate, population, and markets of secondary importance. The 8,000 feedlots in the 13 western states, although comprising less than 5 percent of the feedlots in the United States, provide more than one-third of the nation's fed beef output. The largest lots are located in California, Arizona and Texas. Among states, lot capacity ranges from an average of 2500 head in California to 200 head in Wyoming.

Feedlot size concentration is greatest in California, followed by other southwest states. California does not appear to have increased its concentration over the past decade. Colorado, however, has shown a marked increase in concentration since the early 1950's. Other western states, all of relatively low concentration, have had some increase.

The Pacific Coast and southwest states experienced the highest cattle feeding growth rates during the 1950's and early 1960's, with Texas increasing its share of both the United States and western region fed cattle output. Colorado and Montana had moderate percentage increases. Other western states had growth rates below the United States average, with Wyoming, Utah and Idaho showing decrease in either the shares of the United States or western states fed cattle production or both.

Using meat packer ownership of cattle on feed as a criterion, it appears that a greater degree of integration in the cattle feeding industry is present in the West as compared to other feeding areas. During the early 1960's approximately 15 percent of the cattle on feed in the western states was packer owned, compared to 2 percent in the north central states and 7 percent in all 39 feeding states. Two-thirds to three-fourths of all packer owned cattle were fed in the West; more than one-third in the two states of California and Texas. Available data would indicate, however, that little change in the relative importance of custom feeding in the West has occurred in the past ten years.

Less than full utilization of capacity, resulting from feedlots only partially filled or filled only part of the year, tends to be related to lot size, with large lots having a higher utilization percentage than small lots. However, in several western states and in the Plains and Cornbelt regions, lots of 500-999 head capacity reported lower utilization in the spring of 1961 than either smaller or larger capacity lots. It is hypothesized that home grown feed, cattle and labor tend to keep small lots filled; high fixed costs are an incentive to utilize large lots; and operators of medium sized lots are not as responsive to either set of pressures. Rate of turnover, which is dependent upon level of lot utilization and length of the feeding period, increased with lot size.

Efficiency of feed use is probably the most important physical measure in the cattle feeding program. Since it varies with the type and amount of ration fed as well as the ability of the animal to use the feed, there can be no optimum figures for state or regional coefficients of feed conversion or weight gain. Twenty to 25 pounds daily feed consumption for animals on full feed was most common in western states, with the amount varying by type of ration. Feed consumption per pound of gain was 8 to 9 pounds in California, Colorado and Arizona. In New Mexico, Idaho, and Nevada where more roughage is fed and warmup operations are more prevalent, 10 to 11 pounds of feed were required for each pound of gain. Daily weight gain was reported at 2.5 to 2.8 pounds in states feeding "hot" rations and 2.0 to 2.2 pounds in other states.

A possible increase of 0.1 to 0.2 pounds in gain per day over the past decade is indicated.

Western feedlots in the early 1960's were stocked primarily with USDA Good grade feeders. California and the southwest states fed a larger proportion of "Okies," Brahmas, and Mexican cattle than in the early 1950's. While yearling steers and heifers continued to constitute the majority of cattle fed, there appeared to be somewhat more feeding of calves than 10 years previous.

The large volume feeding states, California, Colorado and Arizona, import a majority of the feeder cattle fed. Sources include other western states, plains states, southeast states and Mexico. Direct purchases, auctions and order buyers, in that order, are the most important market sources for feeder cattle. Auctions have increased in relative importance as a feeder cattle market source since the early 1950's, while direct purchases, order buyers and terminals have become relatively less important. In comparing cattle feeding regions, direct and contract purchase of feeder cattle was found to be less prevalent progressing eastward; terminal market purchase and raising of feeders became more important moving eastward. Auction and dealer sources were of about

equal importance in the West, Plains and Cornbelt regions.

Barley, and milo in the southwest states, constitute the primary grains fed in western feedlots. Alfalfa hay and corn or other silage are major roughages. Although either concentrates or roughages may make up as little as 15 percent or as much as 60 percent of the ration, depending upon the type of feeding program being followed, neither the rations fed nor the 150 to 160 day typical feeding period has changed much over the past ten years. Individual feeding areas use the by-products of agricultural commodities grown locally, including those from sugar beets, citrus, cotton, almonds, potatoes, and in Hawaii, pineapples and sugar cane. Four to five percent commercial protein supplement is usually included in the ration. Roughages are purchased locally when not grown. Grains are purchased primarily from in-state sources.

About 70 percent of the slaughter cattle marketed from western feedlots in the early 1960 decade were sold direct to packers. The percentage of direct sales has increased since the 1950's. Sales through auctions, the only other major outlet for slaughter cattle in the West, have increased in some states and declined in others. Pricing of slaughter cattle is on the liveweight bid basis, with 2 to 6 percent "pencil" shrink when selling direct, depending on weighing conditions, type of cattle and rations, and local practice. Pricing practices have changed little over the past decade.

Fifty to 70 percent of western slaughter cattle were fed to USDA Choice grade. Twenty-five to 45 percent were marketed as USDA Good, with differences among states. An indicated slight tendency toward a higher proportion of Good Grade, as compared to the 1950's, is consistent with broader consumer acceptance of beef with somewhat less finish.

Feeding costs can be expected to decrease with increasing lot size and increasing level of utilization. Average total costs, other than feed and cattle, of typical feeding enterprises in the western states during 1961 to 1964 were from 12 to 14 cents per head per day for lots of less than 500 head capacity. Intermediate sized lots had costs within the 8- to 12-cent range. Feedlot investment costs differed considerably among reporting states; some of the difference may have been due to the accounting methods employed. In all states, however, investment cost per head decreased as lot size went up.

The most prevalent method of assessing custom feeding charges in western states is on a feed consumption basis, either with or without yardage fees. Some cattle were also reported custom fed on a per pound of gain assessments basis. In custom feeding agreements the cattle owner typically assumes responsibility for veterinary fees, drugs, insurance and death loss.

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