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Analysis of Carcass Grade and Weight Sales of Fat Cattle in Arizona and Southern California

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ANALYSIS OF CARCASS GRADE AND WEIGHT SALES OF FAT CATTLE IN ARIZONA AND SOUTHERN CALIFORNIA[1]

by

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Summary

At least 95 percent of the slaughter cattle marketed in Arizona and Southern California are sold direct to the packer. Four different bases are used: (1) live-weight basis, weighed at the feedlot, (2) carcass grade and weight basis, (3) carcass weight basis, and (4) open consignment.

The most popular basis is live weight, with the other three bases being used to different degrees, depending upon the market situation. Carcass grade and weight basis has been considered by several agricultural economists to be the most equitable method of selling slaughter cattle. It eliminates the uncertainty in estimating the grade and weight of carcasses that slaughter cattle will produce. (Carcass grade weight sales should not be confused with open consignment sales.) However, this basis of sale has been criticized by part of the feeders in Arizona and California for three different reasons. (1) The feeder must depend upon the packer to pay on the actual carcass grade and weight.[3] (2) The feeder owns the cattle and the carcasses produced from his cattle until the carcasses have been graded. This extends credit to the packer. (3) Some feeders feel that cattle sold on carcass grade and weight basis sold at a lower price per pound of carcass than those slaughter cattle sold on a live-weight basis and that such sales cause the wholesale price of beef to decline.

The Department of Agricultural Economics of The University of Arizona began in the fall of 1957 a study to determine if there were any inequities in this method of sale, and the effect of this method of sale on the market structure for slaughter cattle in Arizon and California. This study continued through the calendar year of 1960. Data on comparable sales, live weight and carcass grade and weight basis, were collected for the years 1957 through 1960. The data collected on carcass grade and

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[1] This publication presents results from research conducted under Western Regional Project WM-39, "An Economic Analysis of Alternative Marketing Methods of Cattle and Sheep in the West."

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[3] There was no practical way for the feeder to identify the carcasses produced from his cattle after the cattle were slaughtered.

weight sales for 1958, 1959 and 1960 were inadequate for analysis. The statistical analysis indicated that most of the time the carcass grade and weight sales were significantly lower than the live-weight sales for the year 1957.

The results of the 1957 data caused the authors to examine carefully the structure of the slaughter cattle market in Arizona and California. From this examination it became apparent that the feeders who sold on a grade and yield basis did not have the opportunity to sell at the same live-weight price that the feeders did who sold on a live-weight basis.

From two standpoints it is to the packer's advantage to purchase cattle on the carcass grade and weight basis: (1) the packers don't pay for the carcasses until the carcasses are weighed and graded, and (2) they don't have to assume the uncertainty of estimating the grade and weight of the carcass that will be obtained from the live animal. For these reasons the packers prefer to purchase cattle on a carcass grade and weight basis.

The relative bargaining powers of the packers and feeders were explored. It was found that the feeders were in a stronger bargaining position in 1958, but this position declined in 1959 and 1960. However, it wasn't until August, September and October of 1959 and the latter half of 1960 that the number of carcass grade and weight sales increased materially.

During these periods the price of choice grade 900-1100 pound steers dropped below 25 cents per pound. The cost of feeding during the study ranged from 22 to 25 cents a pound. Some of the feeders were willing to accept the cost of extending the ownership of the cattle until they were slaughtered, and the carcasses weighed and graded, and the uncertainty of the packer paying on the correct grade and weight in order to reduce loss. The packer will pay a higher price on a carcass grade and weight basis, but the feeder doesn't feel that the loss of control of his cattle is worth the difference in price as long as he is making a profit over the cost of feeding. Therefore, the feeder who sold on a carcass grade and weight basis did not sell, in most instances, below the price he would have received on a live-weight basis. Consequently, carcass grade and weight sales did not weaken the wholesale market for beef.

INTRODUCTION

At least 90 percent of cattle sold for slaughter out of commercial feedlots in Arizona and Southern California are sold directly to the packers. The major method of sale for fat cattle sold direct is live-weight basis. There are three other methods used to a limited degree: (1) carcass grade and weight, (2) carcass weight, and (3) open consignment. Carcass grade and weight is usually called a "grade and yield" sale by the trade, while carcass weight is called a "rail" sale.

The ownership of cattle sold on a live-weight basis is transferred from the feeder to the packer after the cattle were weighed over the feedlot scales and a pencil shrink had been takn.[4] This pencil shrink was usually

[4] A comparison of prices received for live-weight sales in the "country" markets of Arizona and California and the "terminal" markets of Los Angeles, California; Denver, Colorado; Kansas City, Missouri; and Omaha, Nebraska has been in *Direct Sales Versus Terminal Markets for Selling Fat Cattle*, by N. Gene Wright and Thomas M. Stubblefield, Arizona Experiment Station Bulletin 152, December 1962.

four percent with one hour stand before weighing, or a five percent with no stand.[5]

Ownership of cattle sold on a carcass grade and weight basis is transferred in the packing plant after the carcass has been weighed and graded. (Open consignment sales should not be confused with carcass grade and weight sales. The ownership of consignment sales is transferred when the packer sells the carcass.) The grading is done by a USDA grader in most instances. In some instances the seller takes the "house grade" in place of the USDA grade. The feeder pays the cost of transporting the cattle to the packing house when cattle are sold on carcass grade and weight, carcass weight, and open consignment. (Carcass weight and open consignment sales are not included in this report but will be included in a subsequent report.)

Theoretically, carcass grade and weight sales are the most equitable of any method of sale of livestock. The packer cannot take advantage of the seller if the seller is not very adept at estimating yield. At the same time the packer is not confronted with the possibility of overestimating the yield. The same is true for the grade.

Carcass grades as established by the U. S. Department of Agriculture are based on subjective criteria rather than objective criteria. That is to say that the grader has to consider several factors when deciding whether a carcass falls into one grade or another. In the case of a carcass that was on the borderline between two grades, one grader might give one factor more importance than another and place the carcass in the higher grade while another grader might give the first factor less importance and place the carcass in the lower grade. The packer can argue with the grader and sometimes get the carcass upgraded.

Some feeders feel that the packer might not try as hard to get carcasses in a higher grade when they are bought on carcass grade and weight basis as when the packer buys the cattle on the live-weight basis. Also, since the seller does not see the carcasses weighed or graded, he has to depend on the packer to give him the correct weight and grade.

There has been a great deal of discussion on the part of the feeders in Arizona and Southern California on the merits of carcass grade and weight sales. In general, carcass grade and weight sales had at least two disadvantages. (1) The feeder has to depend upon the packer paying the feeder on the correct grade and weight of the carcasses sold. (2) The packer doesn't own the carcass until it is graded. This, in effect, causes the feeder to extend credit to the packer.

In the past, some feeders have felt that cattle sold on carcass grade and weight basis were sold for less per pound of carcass than if the cattle had been sold on live-weight basis. If this were true, the packer who purchased cattle on a carcass grade and weight basis had an advantage in selling at the wholesale level.

The Los Angeles slaughter cattle market exerts more influence on the price of slaughter cattle in Arizona and California than any other market.[6]

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[5] A pencil shrink is the percentage of shrink agreed upon times the scale weight; i.e., 1,000 lb. steer × 5% = 50 lbs. Thus the pay weight would be 1,000 lbs. – 50 lbs. = 950 lbs.

[6] The 1956-1960 average annual slaughter was 1,440,000 head for Southern California and 921,000 head for Northern California. One million two hundred and one thousand head of the 1,440,000 slaughtered in Southern California was slaughtered in Los Angeles County. Source: *California Livestock, Monthly Slaughter;* California Crop and Livestock Reporting Service, Sacramento, February 4, 1963.

The dominant factor in the Los Angeles wholesale beef market is the retail chains.[7] Los Angeles packers are continuously trying to increase their share of the market. The principle means of doing this is to offer to sell to the chains at a lower price than their competitors. Therefore, if a packer is able to purchase comparable grades of cattle at a lower price, he can offer to sell at a lower price and increase his volume of sales. If, during periods of increased volume of sales, the packers purchase cattle at a lower price when purchasing on a carcass grade and weight basis, such sales could force the wholesale price down which, in turn, would force live-weight sale prices down, etc.

Objectives

There were two main objectives to this study:

(1) To determine if there were inequities in selling on a carcass grade and weight basis and if such sales created a weakness in the market structure.

(2) To determine why there were more sales on a carcass grade and weight basis during some years than others.

Statistical Analysis

In order to compare returns from carcass grade and weight sales and live-weight basis sales, the Department of Agricultural Economics, The University of Arizona, collected and analyzed data on cattle sold on carcass grade and weight basis and live-weight basis out of Arizona and Southern California feedlots. Enough data were collected in 1957 to make a comparison, but during the years of 1958, 1959, and the first half of 1960, the amount of carcass grade and weight sales was too small and not distributed evenly enough for an analysis of the data to be reliable. It should be noted, however, that the amount of sales on a carcass grade and weight basis increased during August, September, and October of 1959, and the latter half of 1960.

The results of the analysis of the 1957 data indicate that the cattle sold on the carcass grade and weight basis sold for less money per pound of carcass than those cattle of the same grade sold on the live-weight basis. Steers grading choice and weighing 800-1025 pounds and sold on the carcass grade and weight basis sold on the average of about 87 cents per hundred pounds of carcass, or about 50 cents per hundred live weight, less than those sold on a live-weight basis.

Choice 700-1000 pound heifers sold on a carcass grade and weight basis brought about 25 cents per hundred pounds on carcass basis, or 15 cents per hundred live-weight basis less, on the average, than the same weight and grade heifers sold on a live-weight basis.

The number of good and standard grade steers and heifers sold on the carcass grade and weight basis was not large enough and the sales not distributed throughout the year evenly enough to make a statistically reliable analysis of the prices received by method of sale.

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[7] Williams, Willard F., and Edward Uvacek, *Pricing and Competition on Beef in Los Angeles,* Marketing Research Report No. 413, Marketing Economics Research Division, Agricultural Marketing Service, U. S. Department of Agriculture, Washington, D. C., pp. iv. v.

Figures 1 and 2 show that the difference in prices received by the two methods of sale was not constant. In fact, in case of heifers the prices received from carcass grade and weight sales were higher than the prices received on a live-weight basis during September and November.

The method used to analyze price data for 1957 was a statistical method called analysis of variance. Those who wish to examine the statistical results can find them in the Appendix.

Before the results of the 1957 analysis could be accepted, it was necessary to determine if the feeder who sold on a carcass grade and weight basis had the same opportunity to sell at the same price on a live-weight basis as those feeders who did sell comparable grades of cattle on a live-weight basis.

The authors found that the following conditions existed:

(1) Commercial feeders in Arizona and Southern California are well informed on market conditions for cattle and beef. They keep abreast with "country" market prices, terminal market prices, wholesale prices, local supply available for sale, and the number of cattle and calves on feed in other major feeding states. They study the wholesale meat market reports more than any other.

(2) The feeders were reported to be as good or better judges as the packer-buyers as to quality and weight of the carcasses that would be produced by the cattle fed by the feeder.[8] Each feeder feeds large numbers of cattle year by year and goes to great length to determine the performance of his cattle. He knows the area from which the feeder cattle came, how long the cattle had been on feed, the kind of ration fed, and the performance of similar cattle in his and other feedlots.

(3) Cattle sold on carcass grade and weight basis, 1957-1960, were usually shown by the feeders to several packer-buyers and offered for sale on a live-weight basis. The packer-buyers made offers on a live-weight basis. However, the feeder hesitated to sell the cattle at the price offered because he felt that the price offered was not in line with current wholesale prices in relation to the feeder's estimate of the grade and weight of carcasses he thought his cattle would produce. The feeder either asked — or the packer-buyer offered — a carcass grade and weight price; i.e., so much a hundredweight for each carcass grade. If the feeder thought he would obtain a higher total return by selling on a carcass grade and weight basis, he would usually sell his cattle on that basis.

(4) The fact that the feeder knew the live weight of the cattle he sold for slaughter and also had offers on a live-weight basis placed him in a position to know what he would have received for the cattle if he had accepted the live-weight basis offer. Thus, if he received less for his cattle when he sold on a carcass grade and weight basis than if he had sold on a live-weight basis, he was reluctant to sell any more cattle on the carcass grade and weight basis. In fact, the part of the data on live weight and carcass grade and weight sales were data on sales by the same feeder.

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[8] Packers, packer-buyers, and market news reporters told the authors that feeders are more able to estimate the carcass grade and weight of the cattle they fed than were the packers, packer-buyers, or market news reporters.

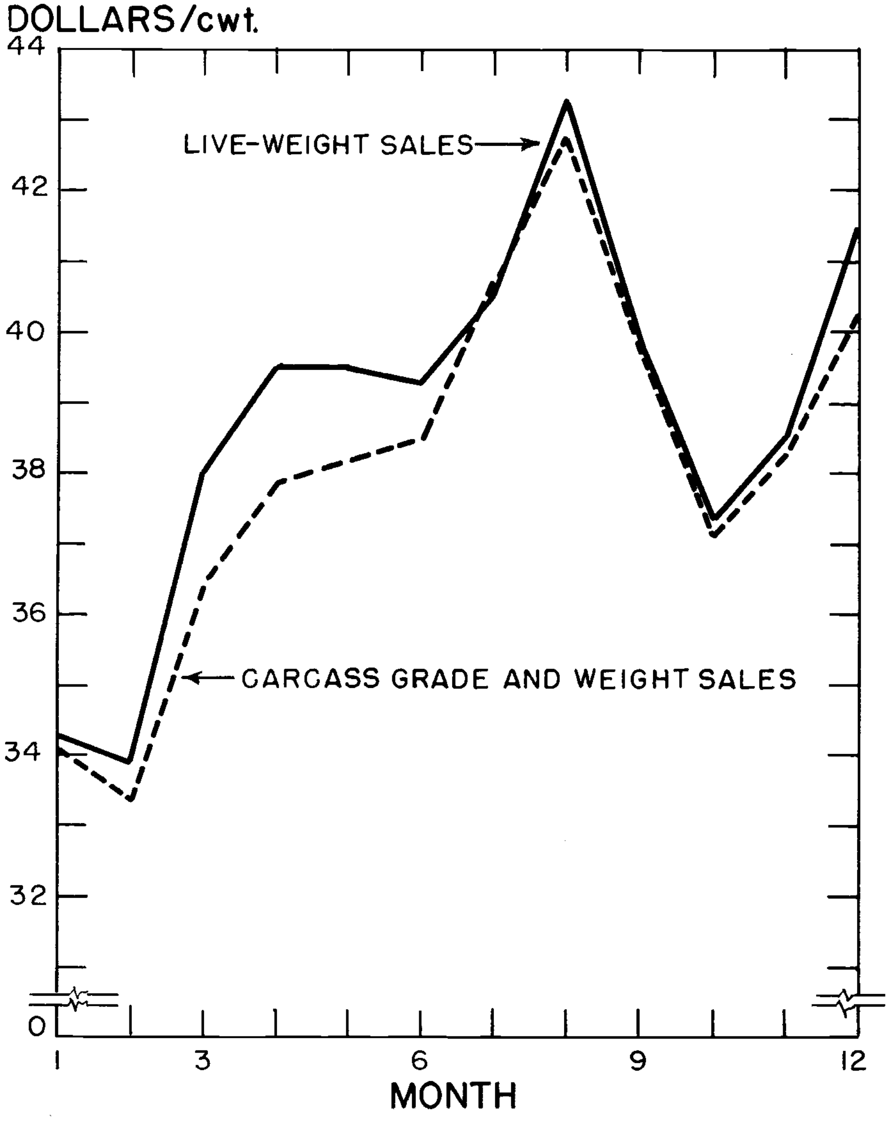

FIGURE 1. *The average price per hundred pounds of carcass received for choice grade, 800–1025 pound steers, sold in the Los Angeles area during 1957, by method of sale.*

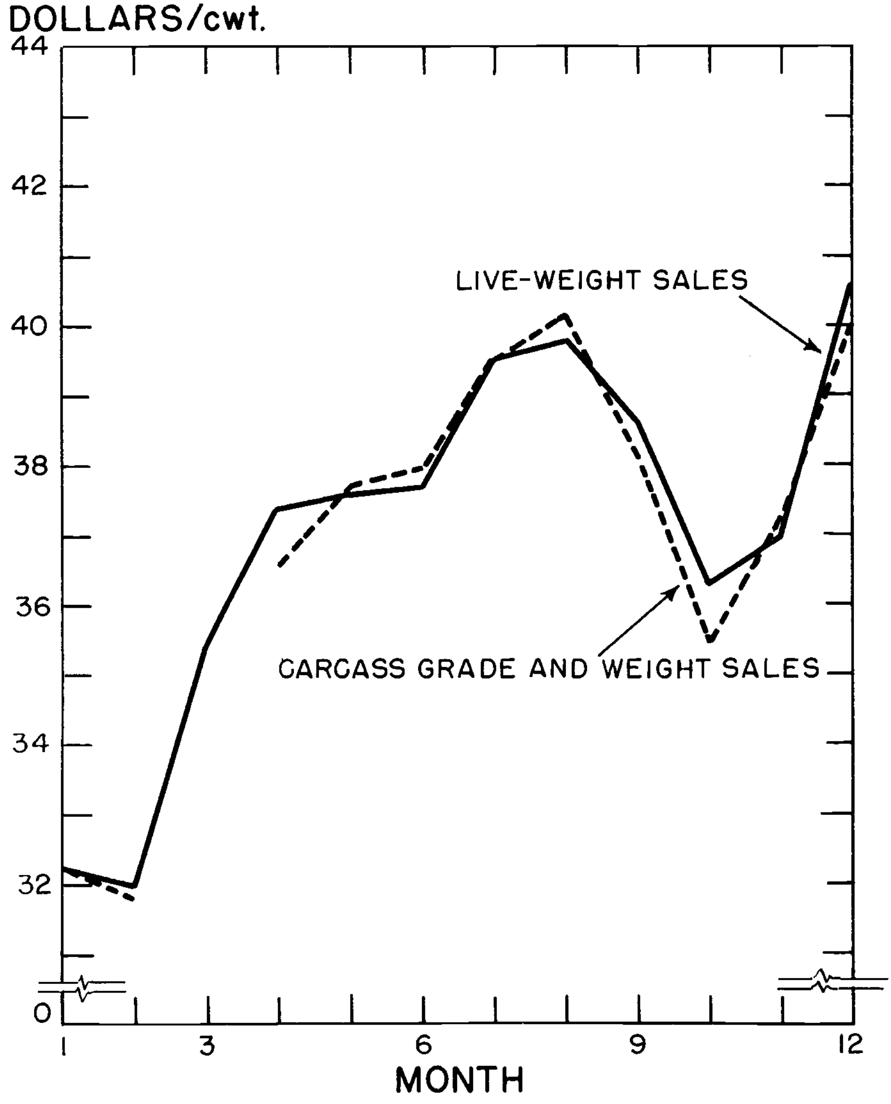

FIGURE 2. *The average price per 100 pounds of carcass received for choice grade heifers, 700–1000 pounds, sold in the Los Angeles area during 1957, by method of sale.*

The results of this survey indicate that the feeders who sold on a carcass grade and weight basis did not have an opportunity to sell at the same price per pound of carcass, for the same grade, as did those who sold on live-weight basis.

Market Structure

In order to more fully examine the market conditions that existed when carcass grade and weight sales were made and explain why there was a relatively small number of carcass grade and weight sales during 1958, most of 1959, and the first half of 1960, the market structure of the slaughter cattle market in Arizona and California during the period 1957-1960 was examined.

In order to examine the market structure further, seven factors were studied. They were: (1) packers' margins plus the value of by-products, (2) the cost of labor in packing plants, (3) the volume of kill, (4) the financing of the kill by the packer during periods when the volume of kill was increased substantially, (5) the importance of carcass cutout, (6) the attitude of the feeders toward selling on a carcass grade and weight basis, and (7) the cost of feeding in relation to the price of slaughter cattle.

There were three markets in which the Los Angeles packers bargained — the wholesale market, the live cattle market, and the labor market. Williams and Uvacek found that the large retail stores were the dominant price-making force in the Los Angeles market area in 1956.[9] There was no indication that this situation had changed during the period covered by this study. The labor market is discussed further on in this publication. It should be pointed out that the labor union has established definite restrictions on the bargaining position of the packers in the labor market.

As was stated earlier, Los Angeles is the major marketing area for fat cattle fed in Arizona and Southern California. The packers in this area had to pay any laborer who worked in their plants on a Monday for a 40-hour week. This creates a situation where the packer has to keep a rather uniform number of livestock running through his packing plant in order to have the lowest per-unit cost. Another characteristic of the packing plants in the Los Angeles area is that each plant usually kills only one species of livestock — cattle, sheep, or hogs.[10]

The Los Angeles packers sell a very high percentage of their total kill locally.[11] If the wholesale price of beef in Los Angeles rises above the wholesale price for the same weight and grade categories in Denver, Colorado, or other terminal markets, to the extent that the differential

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[9] Williams, Willard F. and Edward Uvacek, *op. cit.*, pp. iv-v.

[10] Seltzer, R. E., *The Los Angeles Market for Western Cattle,* Technical Bulletin 137, Agricultural Experiment Station, The University of Arizona, Tucson, April 1959, p. 13.

[11] In 1956, 684,891,000 pounds of a total of 918,498,000 pounds of beef slaughtered in Southern California were sold in Los Angeles County, California, and most of the remainder was sold primarily to retailers in the nearby urban area of Orange, Riverside, and San Bernardino. Dietrich, Raymond A., and Willard F. Williams, *Meat Distribution in the Los Angeles Area,* Marketing Research Report No. 347, USDA, AMS, Washington, D. C., 1959, pp. 14-16.

pays the cost of transporting carcasses to Los Angeles, the Los Angeles chains bring in carcasses.[12]

The United States Department of Agriculture found that 10 percent of the total consumption of beef in the Los Angeles area was shipped in from other slaughter areas during 1956 — a period of increased slaughter.[13] When the supply of fed cattle in Arizona and California is smaller than is needed to meet the needs of the Los Angeles area, beef moves in from Denver and other areas to the East to a greater extent than usual.

There were instances during the study when the shortages of slaughter cattle in Arizona and Southern California were rather acute, such as in 1958 when Los Angeles packers purchased slaughter cattle in the Colorado feeding areas. Although the Los Angeles packers were selling at a disadvantage as compared to Denver packers, they brought in the live cattle in order to maintain their volume of kill.[14]

There are approximately 30 packers in the Los Angeles area — 28 independent and 2 national packers.[15] When the supply of slaughter cattle and calves in Arizona and California is smaller than the number needed to keep their killing floors operating at an optimum level, the competition among them is very keen. Only when there is more than enough cattle to keep their killing floors operating at the optimum level are these packers in a more favorable bargaining position with the feeders.

As was stated earlier, one could hypothesize that the fluctuations in the volume of carcass grade and weight sales were due to the fluctuations in the bargaining position of the packer. When there were large numbers of cattle to be slaughtered, as there were in 1957 in Arizona and California, the packer was able to obtain all the cattle he needed to keep his killing floor operating at an optimum level. The packer could force the feeder to sell on a carcass grade and weight basis those cattle which were of "off type" or not needed to keep his killing floor operating at an optimum level. However, with the cattle available for slaughter decreasing drastically in 1958, the feeder could force the packer to purchase all his cattle on live-weight basis. With the packers competing among themselves for slaughter cattle and with the packers' bargaining position being limited to the fat cattle market, this bargaining position should be reflected in the packers' margins plus the value of by-products.

Packers' Margins Plus the Value of By-Products

The packer's margin is the difference between the wholesale price of beef and the price the packer paid for the carcass. When the slaughter cattle were purchased on a live-weight basis, the price per hundredweight of carcass paid by the packer was determined by dividing the price per hundred pounds — pay weight — by the dressing percentage and multiplying by 100.[16] In the case of carcass grade and weight sales, it was the

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[12] The cost of transporting carcasses by truck from Denver to Los Angeles during the study was approximately $1.75 per hundred pounds.

[13] Williams, Willard F. and Edward Uvacek, *op. cit.*, pp. 7, 8.

[14] The cost of transporting live cattle from Denver to Los Angeles is greater when converted to a carcass basis than for transporting carcasses.

[15] Dietrich, Raymond A. and Willard F. Williams, *op. cit.*, p. 4.

[16] Pay weight when slaughter cattle are purchased directly from the feeder is usually live weight minus five percent pencil shrink.

actual price paid per hundred pounds of carcass. The packer's margin, plus the value of the by-products, is the return to the packer for slaughtering and distributing the meat. Thus, the magnitude of the packers' margins plus the value of by-products — everything else being equal — indicates their relative bargaining position one year as compared to another.

Tables 1 and 2 give the packers' margins and value of by-products for choice and good grade 900-1100 pound steers for 1957 through 1960. The packers' margins decreased in 1958 as compared to 1957, then increased in 1959 and 1960. However, when packers' margins plus the value of by-products were considered, there was a decrease in the annual average for 1958 for choice grade 900-1100 pound steers as compared to the annual average for 1957, while the annual average for 1959 and 1960 was bigger for this category of slaughter cattle than it was in 1957. In the case of good grade 900-1100 pound steers, the annual average of the packers' margins, plus the value of the by-products, increased in 1958, 1959 and 1960.

As we explained earlier in this report, the number of cattle sold on carcass grade and weight basis decreased in 1958, and this basis of selling slaughter cattle was of no major importance until late summer and early fall of 1959, after which time the use of this method of sale again decreased until late summer and early fall of 1960.

If the bargaining position of the packers lessened in 1958, 1959, and the first half of 1960, it would be logical that the packers' margins would decline relative to their margins in 1957. Tables 1 and 2 indicate that packers' margins declined in 1958 and increased in 1959 and 1960 while the value of by-products was higher in 1958, 1959, and 1960 than in 1957.

The fact that the packers' margins increased in 1959 and 1960 could indicate that the packers were in a stronger bargaining position than the feeders during 1959 and 1960. In order for this to be true, the packers' costs would have had to remain constant and their volume of kill would have had to remain constant or increase.

The only indicator of packers' costs which was readily available was the cost of labor in packing plants. As far as the authors were able to determine, the physical efficiency of the Los Angeles packing plants did not change appreciably during the period of study.

Table 1. Packers' Margins and Value of By-Products in the Los Angeles Area for Choice 900-1100 Pound Steers per Hundred Pounds of Live Weight.

Period		Packers' Margins[a]	By-Products[b]	Total
1957				
	1st quarter	$ .46	$1.92	$2.38
	2nd quarter	.82	2.15	2.97
	3rd quarter	.52	2.30	2.82
	4th quarter	.74	2.06	2.80
	Annual average	.63	2.11	2.74
1958				
	1st quarter	.43	2.17	2.60
	2nd quarter	.23	2.40	2.63
	3rd quarter	.49	2.35	2.84
	4th quarter	.32	2.34	2.66
	Annual average	.37	2.31	2.68
1959				
	1st quarter	.94	2.41	3.35
	2nd quarter	.18	2.90	3.08
	3rd quarter	.62	2.82	3.44
	4th quarter	.91	2.29	3.20
	Annual average	.67	2.60	3.27
1960				
	1st quarter	1.20	2.19	3.39
	2nd quarter	.60	2.33	2.93
	3rd quarter	.98	2.25	3.23
	4th quarter	.97	2.21	3.18
	Annual Average	.94	2.24	3.18

[a] Packers' margins were determined by dividing the average price received for choice 900-1000 pound steers at Los Angeles are reported by the Market News Branch, USDA, by 60 percent for the years of 1957 and 1958, and by 60.5 percent for 1959, and 61 percent for 1960, and multiplied by 100. This figure was then subtracted from average Los Angeles wholesale price for choice grade 500-600 pound carcasses as reported by the Market News Branch, USDA. This figure was then converted to live-weight basis. According to the data gathered in this study, the average dressing percentage for the years 1957 and 1958 for choice grade 900-1100 pound steers was 60 percent. The dressing percentage increased in 1959 to 60.5 percent and in 1960 to 61 percent. This is explained by an increase in the percent of concentrate feed in the rations during 1959 and 1960, and the cattle were fed for longer periods than they were in 1957 and 1958.

[b] This figure is the average for the United States as reported by the USDA in *Marketing and Transportation Situation.*

Table 2. Packers' Margins and Value of By-Products in the Los Angeles Area for Good 900-1100 Pound Steers per Hundred Pounds of Live Weight.

Period	*Packers' Margins*[a]	*By-Products*[b]	*Total*
1957			
1st quarter	$ .30	$1.92	$2.22
2nd quarter	.71	2.15	2.86
3rd quarter	.17	2.30	2.47
4th quarter	.32	2.06	2.38
Annual average	.37	2.11	2.48
1958			
1st quarter	.45	2.17	2.62
2nd quarter	.30	2.40	2.70
3rd quarter	.15	2.35	2.50
4th quarter	.01	2.34	2.35
Annual average	.23	2.31	2.54
1959			
1st quarter	.37	2.41	2.78
2nd quarter	.32	2.90	3.22
3rd quarter	.55	2.82	3.37
4th quarter	.83	2.29	3.12
Annual average	.52	2.60	3.12
1960			
1st quarter	.96	2.19	3.15
2nd quarter	.58	2.33	2.91
3rd quarter	1.24	2.25	3.49
4th quarter	.80	2.21	3.01
Annual average	.90	2.24	3.14

[a] Packers' margins were determined by dividing the average price received for good 900-1100 pound steers at Los Angeles as reported by the Market News Branch, USDA, by 59 percent for the years 1957 and 1958, and by 59.5 percent for 1959, and 60 percent for 1960, and multiplied by 100. This figure was then subtracted from the Los Angeles average wholesale price for good grade 500-600 pound carcasses as reported by the Market News Branch, USDA. This figure was then converted to live-weight basis. According to the data gathered in this study, the average dressing percentage for the years 1957 and 1958 for good grade steers, 900-1100 pounds, was 59 percent. The dressing percentage increased in 1959 to approximately 59.5 percent and in 1960 to 60 percent. This is explained by an increase in the percent of concentrate feed in the rations during 1959 and 1960 ,and the cattle were fed for longer periods than they were in 1957 and 1958.

[b] This figure is the average for the United States as reported by the USDA in *Marketing and Transportation Situation.*

Cost of Labor in Packing Plants

The cost of labor in the packing plants in Los Angeles has been increasing throughout the four years covered in this study (see Table 3). This means that the packer needed a larger total income per hundred pounds of live weight or an increase in the physical efficiency of the plant in order to maintain the same net income per hundred pounds of live weight of cattle slaughtered if volume remained the same. There could have been an increase in the total number of pounds of carcass beef killed in the plant and this would have reduced the cost of killing per hundred pounds of carcass.

Table 3. The Common Labor Rates in Packing Houses Working Under the Butchers' Union in the Los Angeles Area.

Year	*Rate per Hour for 40-Hour Week*
1956	$ 2.070
1957	2.145
1958	2.220
1959	2.270
1960	2.420

Volume of Kill

Figure 3 shows the total number of pounds (live weight) of cattle and calves slaughtered in Arizona and California, 1957 through 1960, along with the total number of head of cattle sold out of Arizona and California feedlots during these years. This figure indicates that the number of cattle slaughtered decreased during 1957, reached a low in 1958, and increased during 1959 and 1960 with the total slaughter during 1960 being higher than that slaughtered in 1957. The number of cattle and calves sold out of the feedlots in these two states decreased in 1958 and increased in 1959 over the number sold out of feedlots in 1957 and continued to increase in 1960.

Table 4 gives the inshipments to California for immediate slaughter for the years 1951 through 1960. The data in this table show that the total number of cattle shipped into the state in 1956 was the largest for the 10-year period with the number decreasing constantly since that time in spite of the fact that the population in California has been increasing at a very rapid rate. Imports from Arizona account for 45, 48, 46, and 56 percent of total inshipments of cattle and calves into California for immediate slaughter for the years 1957, 1958, 1959, and 1960, respectively.

Financing Increased Kill

When there is an increase in the number of fat cattle available for slaughter and the packer wishes to increase his kill, he is faced with the problem of increasing his investment in cattle and carcasses or shifting the cost of financing the ownership of the cattle and carcasses to the feeder. When cattle are purchased on a live-weight basis f.o.b. the feedlot, the packer pays the feeder by draft at the time of the sale and the draft takes from one to seven days to clear the packer's bank and be deposited in the feeder's account. As soon as the cattle are slaughtered and the carcasses

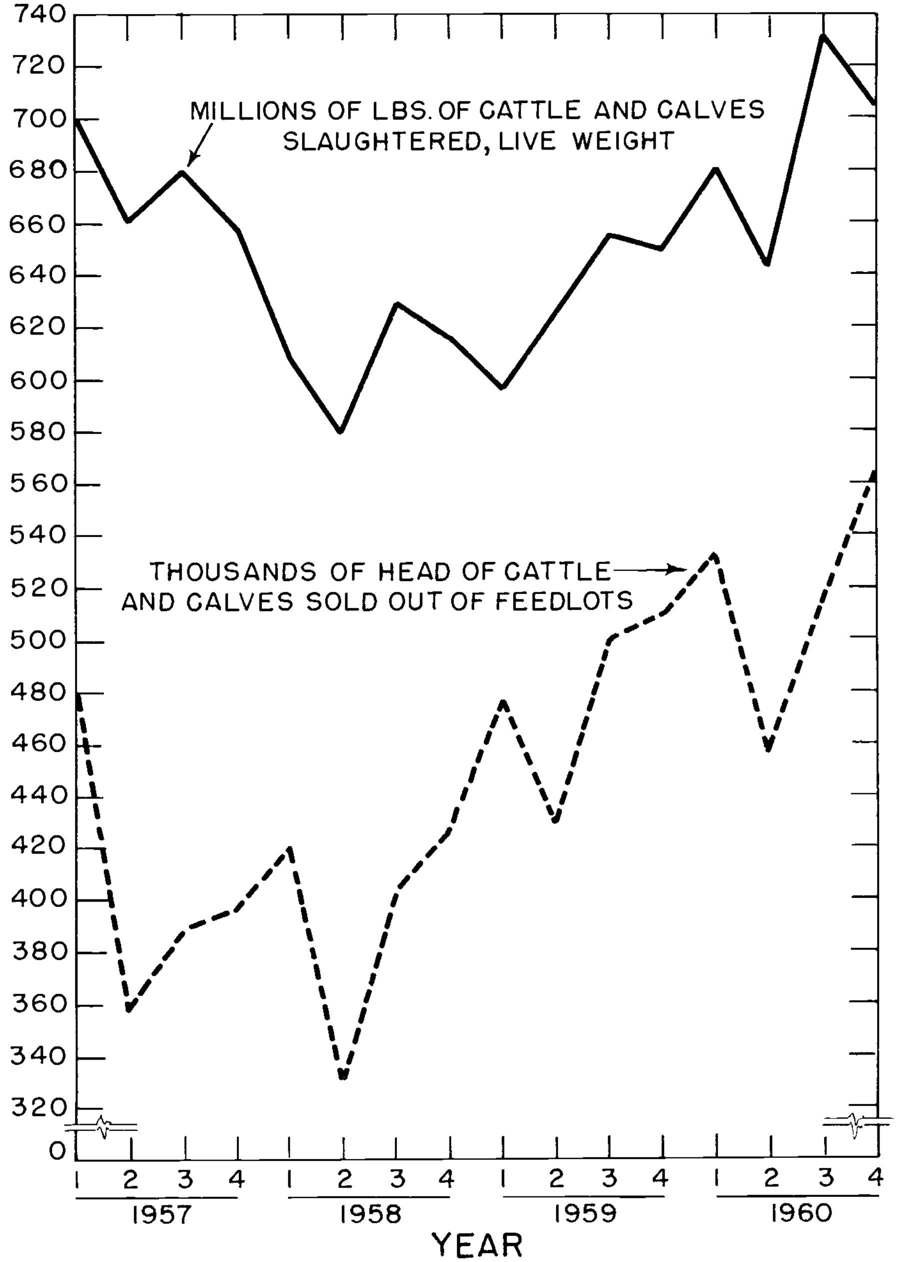

FIGURE 3. *Total slaughter and marketings of cattle and calves out of feedlots in Arizona and California by quarters.*

Source: *Livestock Slaughter* and *Cattle and Calves on Feed*, U. S. Dept. of Agric., Statistical Reporting Service, Crop Reporting Board, Washington, D. C.

Table 4. Cattle and Calves: Number Shipped into California, by State of Origin, 1951-1960 for Immediate Slaughter.

State	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
					(Thousand Head)					
Arizona	117	194	249	235	251	297	295	256	242	253
Colorado	48	46	62	61	19	30	36	29	30	12
Idaho	54	63	92	96	84	117	88	88	92	57
Kansas	4	2	3	11	7	9	3	2	2	5
Montana	25	25	51	59	59	66	43	20	16	7
Nebraska	8	9	30	40	13	11	11	6	4	3
Nevada	19	21	30	30	34	24	26	25	25	21
New Mexico	12	18	28	30	25	29	16	5	6	4
Oklahoma	4	1	3	9	8	13	6	2	1	1
Oregon	22	13	33	27	28	34	22	19	23	17
Texas	50	48	57	93	61	67	42	24	25	32
Utah	42	56	85	79	70	83	62	51	54	36
Washington	—	—	1	—	—	1	2	1	1	—
Wyoming	2	3	7	15	6	6	4	2	1	—
Miscellaneous	1	1	8	12	2	2	2	2	1	2
TOTAL	408	500	739	797	667	789	658	532	523	450

Source: *California Annual Livestock Report, Summary for 1960,* California Crop and Livestock Reporting Service, Sacramento, California, June 1961, p. 11.

sold, the packer is in a position to take the statement of sale to his bank and finance the sale of meat to the retail stores, brokers, wholesalers, etc., and on an accounts receivable basis.[17]

If the packer purchases cattle on carcass grade and weight basis, the packer does not own the cattle until the carcasses are weighed and graded. Very often the carcasses are not graded until the day after slaughter. At this time the packer issues a draft for the cattle. By the time the draft has cleared the packer's bank and has been deposited the feeder's bank, part or all of the carcasses may have been sold allowing the packer to finance the sale on an accounts receivable basis. Thus, if the packer finds it difficult to finance his kill during a period when there is a short-run surplus, he is inclined to encourage the feeder to sell on a carcass grade and weight basis. Due to the intense competition among the packers in the Los Angeles area, each packer is inclined to increase his kill as the supply of slaughter cattle increases to prevent his fellow packers from "capturing" part of the accounts he is filling.

Carcass Cutout

Packers are very conscious of the difference in the cutout of retail cuts of different carcasses. A recent study indicates that this is as high as 13 percent.[18]

The major reason for this is the great variation in the amount of outside and kidney fat on carcasses. Retail cuts from carcasses having a thick outside covering of fat and a large amount of kidney fat have to be severely trimmed before cuts can be sold. Consequently, the retailer discounts such carcasses rather heavily. In order to avoid this problem, Los Angeles packers prefer to buy cattle which will produce carcasses grading low choice. However, such cattle vary greatly in cutout. In order to eliminate this uncertainty, packers try to purchase cattle from feedlots from which they have purchased similar cattle that produced carcasses with high cutability. Large commercial feedlots in Arizona and Southern California usually have several different types and qualities of cattle on feed at any one time.

In addition, in periods of market gluts, some feeders are inclined to feed to heavy weights, hoping there will be an upturn in the market. In such instances, packers are usually able to fill their immediate needs with cattle they feel would do the best in their packing plants. When the supply of fat cattle is more than enough to keep the packers' killing floors operating on a 40-hour-week basis, the packers can be more discriminating in their purchases.

Feeders' Attitudes About Selling on Carcass Grade and Weight

The authors visited most of the large feedlots in Arizona and several in California during the period of 1957-1960. Most of the feeders indicated they avoided selling on a carcass grade and weight basis because they had no way of checking on grades and weights of the carcasses sold and had to extend credit to the packer until the carcasses were weighed and graded. There were a few feeders who sold to a few packers on the carcass grade

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[17] The packers in the Los Angeles area extend credit to their debtors for a two-week period. At times it takes as long as three weeks to collect some of the accounts.

[18] *Meat Type Beef Foundation, Carcass Cutout Contest,* January 1961, Safeway Stores, Inc.

and weight basis and felt that the prices received were equal or above those they would have received from other packers on a live-weight basis.

A third group indicated they would sell on a carcass grade and weight basis if they felt that there was a distinct advantage in selling on such a basis. Most of the time they sold on a live-weight basis.

Cost of Feeding

The cost of feeding choice grade heifers and steers has been rather steady for several years at 22 to 25 cents per pound of gain.[19] The average price of good and choice 900-1100 pound steers in Phoenix for 1957 through 1960 is shown in Figure 4. Note that the price of choice grade steers of 900-1100 pounds was below 25 cents per pound during 1957, January 1958, November 1959, and August, September, October, and November 1960.[20] The number of carcass grade and weight sales were at their highest during these periods. The fact that carcass grade and weight sales were at their highes during these periods can be explained by the feeders being willing to take the uncertainties connected with carcass grade and weight sales to obtain a higher price in order to have the "least loss."[21]

Conclusions

1. The feeders who sold cattle on a carcass grade and weight basis did not have an opportunity to sell at the same price as those feeders who sold on a live-weight basis.
2. Cattle sold on a carcass grade and weight basis sold for as high or higher price, in general, than the packers would have paid on a live-weight basis.
3. The Arizona and California feeders were in a stronger bargaining position in 1958 than they were in 1957, 1959, and 1960. Their position declined in 1959 and 1960 until the packers were in almost if not as strong a bargaining position in 1960 as they were in 1957.
4. In spite of their weakening bargaining position, the feeders did not sell cattle on a carcass grade and weight basis until the price of choice grade steers declined to approximately 25 cents a pound or less which was the approximate top range of the cost of a pound of gain in Arizona and California feedlots for 900-1100 pound steers. Thus, most of the feeders were not willing to accept the uncertainty of the packers paying on the correct carcass weight and grade and the cost of financing the ownership of cattle until the cattle were slaughtered and graded as long as the feeder was making a profit over the cost of feeding.

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[19] This figure includes all labor and management cost as well as interest on production loans and investment. This does not include the cost of feeder cattle.

[20] It should be noted that during these periods there was an increase, relatively, in the number of fat cattle available for purchase. However, the same was true of the other periods when prices declined, such as the second quarter of 1958 and the first quarter of 1959, when there was very little, if any, increase in the number of cattle sold on carcass grade and weight basis.

[21] Heavier choice cattle sold for a lower price per pound during the period of study than did choice 900-1100 pound steers. The cost of a pound of gain was also higher.

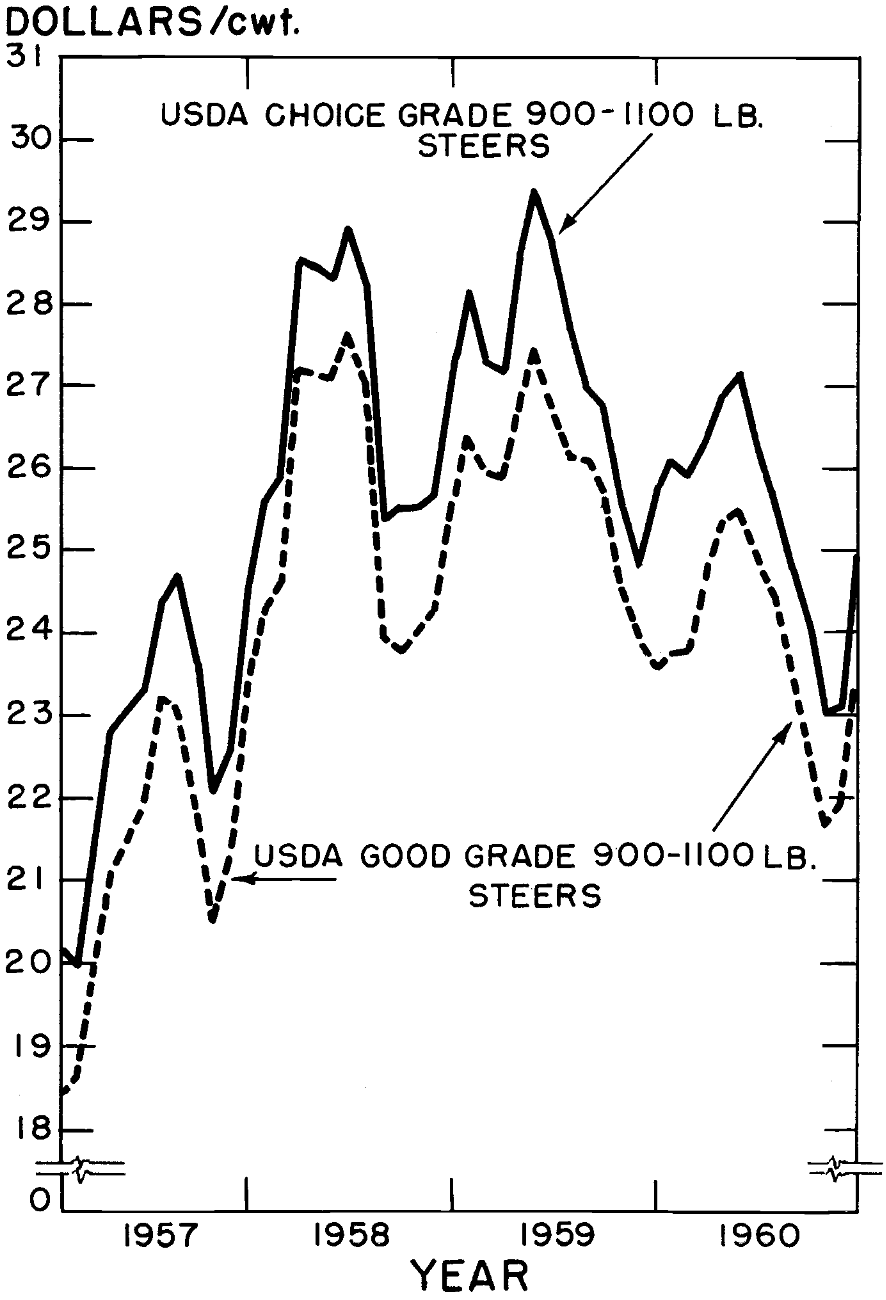

FIGURE 4. *Price of slaughter steers at Phoenix, Arizona.*
Source: Market News Branch, AMS, USDA

APPENDIX

Statistical Analysis of Live Weight Versus Carcass Grade and Weight Sales — 1957

In order to compare different methods of sale, a common basis had to be determined. The common basis in this study was the price received per pound of carcass by grade.[22]

It was possible to secure enough data on only two classes of cattle sold in 1957 — choice 800-1025 pound steers and choice 700-1000 pound heifers. The results of the analysis of variance of prices received for choice 800-1025 pound steers are shown in Appendix Table 1.

Appendix Table 1. Analysis of Variance of Prices Received for Choice Grade Steers, 800-1025 Pounds, Sold in the Los Angeles Area During 1957, Live Weight Versus Carcass Grade and Weight.

Source	*df*	*SS*	*MS*
Months	11	55.98	50.54*
Weeks in Months	40	42.08	1.05*
Treatment	1	17.59	17.59*
Treatment x Months	11	1.63	.15*
Treatment x Weeks in Months (11 weeks missing)	29	1.30	.04
	92	618.58	

* Significant at the one percent level.

The analysis is based on 11,215 head sold on live-weight basis and 2,074 head sold on carcass grade and weight basis, with 11 missing weeks (2 live-weight basis and 9 on carcass grade and weight basis). These data were collected from five cattle feeders — one in California, four in Arizona. One of these feeders sold only live-weight basis; the other four sold both methods.

Appendix Table 2. Analysis of Variance of Prices Received for Choice 700-1000 Pound Heifers Sold in the Los Angeles Marketing Area During 1957, Live Weight Versus Grade and Yield Sales.

Source	*df*	*SS*	*MS*
Months	11	677.26	61.57*
Weeks in Months	40	49.00	1.22*
Treatment	1	1.50	1.50*
Treatment x Months	11	9.39	.85*
Treatment x Weeks in Months (13 weeks missing)	27	1.05	.039
	90	738.20	

* Significant at the one percent level.

[22] This was done by converting cattle sold on a live-weight basis to a carcass grade and weight basis. The sale weight (actual weight at the feedlots minus a four or five percent shrink, whichever was the case) was divided by the dressing percentage times 100 to give the carcass price for the specific grade . Data gathered on carcass grade and weight basis sales were in the form of prices per pound of carcass for specific grades.

Analysis of variance on choice heifers is shown in Table 2. The analysis of choice grade heifer prices is based on 6,021 head sold on live-weight basis and 2,598 head sold on carcass grade and weight basis. Missing are 13 weeks' data — 4 live weight and 9 carcass grade and weight.

The analysis of variance shows that months, weeks in months, treatment, and treatment times months interaction is significant at the one percent level for both heifers and steers. This means that the price varies from month to month and also varies between weeks during a month at the one percent level. The treatment effect shows that a difference exists at the one percent level between the price received for cattle sold live weight and by carcass grade and weight.

Choice 700-1000 pound heifers averaged 36.83 cents per pound live-weight basis and 36.57 cents per pound carcass grade and weight basis. A pound of choice heifer carcass brought .26 cents per pound more on the average when sold on the live-weight basis by the five feeders who furnished sales data for this study.

Choice 800-1025 pound steers brought on the average 38.55 cents per pound live and 37.68 cents per pound by carcass grade and weight basis. This is an average of .87 cent per pound in favor of live-weight basis sales over the carcass grade and weight basis.

A significant treatment times months interaction means that the difference between treatments varied from month to month (at the one percent level). This is shown in Figures 1 and 2 which shows the average monthly price for choice 800-1025 pound steers and choice 700-1000 pound heifers. It is also noted from Figures 1 and 2 that no one method of sale has a consistent advantage over the other during the 12-month period.

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