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A Comparison of the Utah Cattle Slaughter Market with the California Cattle Carcass Market

M. Lloyd Davies

A COMPARISON OF THE UTAH CATTLE SLAUGHTER MARKET WITH THE CALIFORNIA CATTLE CARCASS MARKET

by

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M. Lloyd Davies

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ABSTRACT

A Comparison of the Utah Cattle Slaughter Market with the California Cattle Carcass Market

by

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Utah State University, 1970

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Reliable price data for fat cattle in Utah are becoming difficult to obtain because fewer and fewer slaughter cattle go through market channels where live cattle prices are reported.

The objectives of this study were to determine how correlated Utah fat cattle prices are with the California dressed meat market for cattle and formulate an equation or equations enabling reliable price predictions to be made for the Utah slaughter cattle market.

Utah choice and good steer prices (both direct and auction) were compared to the San Francisco wholesale meat market prices. Utah choicesteer, good steer and choice heifer prices (both direct and auction) were compared with the Los Angeles wholesale meat market prices. All price comparisons were highly correlated except Utah good steer prices and Los Angeles dressed meat market prices.

A regression analysis not only gave the correlation coefficients but was also used to determine any time lags between the Utah slaughter cattle market and the California dressed meat market for cattle. Price changes in the Utah slaughter cattle market are preceded by at least

one weeks change in the California dressed meat market for all classifications and grades of slaughter cattle used in this study.

A mathematical model was formulated which equated Utah fat cattle prices with the California dressed meat market prices. This model as well as statistical model obtained from the regression analysis if used with the time lags predict Utah fat cattle prices very satisfactorily.

(84 pages)

INTRODUCTION

Cattle sold at terminal and auction markets are shipped to market on the basis of anticipated prices. There is no assured or set price that the producer will receive. He has to rely on the forces of supply and demand and hope that the demand for his livestock is strong.

Once the animals have reached market, the supply is essentially fixed, because in the majority of cases it is not feasible to hold animals over at the auction market for later trading or transfer to another auction in hopes of a better price. Supply is essentially fixed also because once the sale conditions have been determined, producers are not able to react quickly enough if supply conditions are low or demand conditions high to transport cattle to the market. The supply then becomes fixed both from inshipments and outshipments, at a particular sale.

This phenomena of a fixed supply gives rise to an infinitely inelastic (vertical) supply curve for the particular trading day. Over the range of an inelastic supply curve the demand sets the price. Thus the prices that a producer receives for his cattle are determined by the strength of the demand for his cattle.

During the past several years there has been a transition in marketing cattle from the terminal market to the local auction market to the direct sales market. Many packers buy slaughter cattle directly from the feeder or have their own feed lots, thus, these animals bypass any public market.

Utah meat packers purchased 53 percent of their cattle kill through auctions and central markets, 44 percent directly from feed lots and ranchers,

and the balance through custom feedlots of their own (8, p. 165). Thus, nearly half of all slaughter animals in Utah never enter the public market.

Large feed lots have a tendency to sell direct to meat packers in contrast with the small cattle producer selling at the local auction or terminal market. Slaughter animals from large feed lots usually have a reputation of being more uniformly finished and having higher quality than cattle fed by small cattle feeders. Meat packers prefer to buy directly because they know the reputation of the feeder and because it is cheaper in comparison with other means of purchase (Table 1).

Table 1. Estimated expenses per head of marketing cattle through various types of markets: 1955

Market outlet	Rate/head
Auctions	2.25
Terminals	2.74
Direct	1.35

Source: Marketing Costs and Margins for Livestock and Meats, Agricultural Marketing Service, Marketing Research Report number 418.

The fixed supply, and large numbers of cattle which bypass public markets through direct sales may have caused unreliable price estimates to be reported from central and local auction markets.

Information gained in this study can be used by cattle producers to determine whether or not current price quotations are reliable. This study will also provide data on price correlations between the Ogden auction and direct sale markets and the California dressed meat markets for cattle. This information is important for producers who want to get the best price possible when they market their cattle.

Meat packers in Utah can also benefit from this study as packer margins will be analyzed. If the packer can operate within these margins, then he can profit by exporting carcass beef to California.

OBJECTIVES OF THE STUDY

1. Determine the importance of California as an importer of Utah carcass beef.
2. Determine price correlations between Utah fat cattle market and the California dressed meat market for cattle. Grades of slaughter steers and heifers at the Ogden auction market and Utah direct sales market will be compared with grades of steer and heifer carcass beef in Los Angeles and San Francisco.
3. Determine Utah meat packer's gross and net margins of slaughter steers and heifers for the years 1967, 1968, and 1969. These margins will be used to determine what Utah prices ought to be.

LITERATURE REVIEW

In reviewing literature on livestock marketing, there was no research found which compared Utah slaughter cattle market with the California dressed meat market for cattle. There were several articles concerning the livestock and meat packing industry which contributed to this study.

Two articles gave an important overview as well as descriptive information on the market structure and marketing activities in the Los Angeles area. The first of these articles was written by Williard F. Williams and Edward Uvacek entitled, "Pricing and Competition on Beef in Los Angeles." These men were employed by the Agricultural Marketing Service of the United States Department of Agriculture. The second article by Raymond A. Dietrich and Williard F. Williams was entitled, "Meat Distribution in the Los Angeles Area."

The first article was published in 1960 and reported demand, supply, and structural characteristics of the Los Angeles beef market. Los Angeles meat packer margins were indicated for 1956-1958 and an analysis was made of meat packer and retailer marketing practices.

The second article was published in 1959 and reported the meat distribution channels of the various meat classifications in Los Angeles. This article was informative on market changes which occured in Los Angeles during 1946-1957.

Information concerning Utah meat exports and slaughtering costs were obtained from "Feasibility of Expanding the Livestock Feeding and Meat Packing Industry in Utah" prepared by M. H. Taylor, L. H. Davis, D. B. Nielsen, S. L. Olsen, and R. H. Woolf. This article was published in January, 1970 by Utah State University cooperating with the United States Department of Agriculture. This article was divided into five sections,

only one section was valuable in this thesis. This section was relevant because of information obtained on the meat packing industry of Utah in 1968. Packer margins and costs, cattle procurement methods, meat exports and an outlook for future expansion in the meat packing industry of Utah were indicated.

Further information concerning meat packing costs were obtained from the August 1963 issue of the Marketing and Transportation Situation. This article gave the cost of buying, processing, and selling dressed beef. The article was entitled, "Meat Packers' Costs and Spread for Beef," and was prepared by Donald B. Agnew.

Marketing costs and margins were obtained from a publication by the Marketing Economics Research Division of the Agricultural Marketing Service entitled, "Marketing Costs and Margins for Livestock and Meat."

Elizabeth L. Murphy of the Marketing Economics Research Division prepared the article, "A Comparison of Small Truck Carriers." This article provided information about costs of carriers of agricultural products. The author wrote concerning the revenues and expenses of these carriers.

A thesis was written by Jerald R. Barnard at Utah State University in 1967 entitled, "A Price Analysis of the Ogden and Los Angeles Livestock Markets for Slaughter and Feeder Cattle, 1956-1960." The purpose of this paper was to determine price differentials between grades of live slaughter steers and heifers. This article was very informative and was important in understanding various relationships of live slaughter prices between the two markets.

Information concerning the market structure of the meat packing industry was obtained from "Packer Feeding of Cattle, Its Importance and

Volume," by Arnold Aspelin and Gerald Engelman. This article was published in November 1966 by the Packer and Stockyard Division, Consumer and Marketing Service of the United States Department of Agriculture. Drs. Aspelin and Engelman reported on the extent of packer feedings in various states. Packer feeding under various market structures was analyzed.

SOURCE OF DATA

Data for this study were obtained from the following sources:

1. Wholesale Meat Trade Quotation, Consumer and Marketing Service, Livestock Division of the United States Department of Agriculture and the California Department of Agriculture cooperating.
2. The Hide and Offal Value Estimates, Consumer and Marketing Service of the United States Department of Agriculture.
3. Ogden Weekly Price Quotations, Consumer and Marketing Service of the United States Department of Agriculture.
4. A personal interview with the meat packers exporting carcass beef to california.
5. California Annual Livestock Report, California Crop and Livestock Reporting Service of the California Department of Agriculture.
6. Statistical Reporting Service of the United States Department of Agriculture.
7. Unpublished information gathered by Utah State University Extension Service.

"The Wholesale Meat Trade Quotation" was used to obtain a five year (1965-1970) time series of weekly price quotations of various classifications and grades of carcass beef in Los Angeles and San Francisco. The various classifications and grades used in this study are:

<u>Los Angeles</u>

Choice Steers	500-700 pounds
Good Steers	500-700 pounds
Choice Heifers	500-700 pounds

<u>San Francisco</u>

Choice Steers	600-700 pounds
Good Steers	600-700 pounds

The midpoint of the price quotations is used in this study.

To obtain the same time series for Utah slaughter cattle, "Ogden Weekly Price Quotations" were used. The classifications and grades obtained and used are:

Choice Steers	800-1200 pounds
Good Steers	800-1200 pounds
Choice Heifers	800-1100 pounds

The above weight classifications are average quotations in this report.

Price quotations of direct sales in Utah were also obtained from the Ogden report. Direct sale prices as well as auction sale prices will be used in this thesis as the basis for comparison with the Los Angeles and San Francisco dressed meat markets. Direct sale prices are weekly random samples of those feed lots which have in the past had a reputation for selling directly to the meat packer.

In this study, the assumption made in making price comparisons is that quality (between and within grades) weight, breed, and type of cattle are the same for each market. The scope of this paper cannot determine this. However, most beef carcasses in Los Angeles are purchased in lots rather than individually. When bought in lots, all carcasses are purchased at the same price as if all are of one grade, irrespective of within grade differences in quality, weight, or breed. This tends to reduce price variability within a grade and to obscure the importance of both weight and quality (9, p. 85).

Weekly quotations of the value of offal and hides were obtained from "The Hide and Offal Value Estimate." This report is published for the purpose of informing the Mid-west and Western portion of the United States concerning hide and offal values. It is important to understand that hide and offal values may vary significantly from day to day, month

to month, and year to year; as well as from city to city and state to state. These estimates are official USDA statistics and it is believed that these figures are applicalbe to the state of Utah. Attempts were made to obtain values from Utah rendering and by-product plants, but this information was not available.

Information concerning carcass beef exports to California was obtained by a personal interview with those meat packers exporting carcass beef to that state, and from unpublished information gathered by the Utah State University Extension Service in 1968. A search through published current literature provided little assistance. Border inspection stations in California record live movements, but not carcass imports. It will probably be several years before carcass movements are kept and recorded by marketing institutions. In 1967 the California Crop and Livestock Reporting Service made the following statement. "The inshipments of dressed meat by trucks are not subject to inspection; therefore, no attempt has been made to assemble this information" (5, p. 16).

The meat packers co-operated by providing a time series of Utah exports from 1965 to 1970. Very rough estimates were available before this time. This five year time period adequately establishes the importance of California carcass beef exports in relation to the Utah meat industry.

Cost figures for transporting carcass meat to California were also obtained from eat packers who export to California. Slaughter and processing costs were obtained from only three of the four packers. These costs were given as a single quotation and not obtainable as a time series.

California shipments of cattle and calves ready for slaughter and the commercial cattle slaughter in Utah were obtained from the California Annual Livestock Report and the Statistical Reporting Service respectively.

UTAH CARCASS BEEF EXPORTS

California

Utah has been exporting carcass beef to California for about fifteen years. As livestock slaughter shifted to the producing areas and away from packing plants at terminal markets, the shipment of carcass beef to California has become more and more significant. During a five year period, California imports of carcass beef, increased 100 percent, from a yearly total of approximately 26.9 million pounds in 1965 to 53.0 million pounds in 1969 (Table 2).

Table 2. Utah exports to California, 1965-1969

Year	Destination Los Angeles millions of pounds	Destination San Francisco millions of pounds	Total millions of pounds
1965	20.0	6.9	26.9
1966	22.0	7.8	29.8
1967	27.7	10.5	38.2
1968	33.2	12.6	45.8
1969	38.1	14.9	53.0

Source: Utah meat packers.

These exports accounted for 15.4 and 32.3 percent of the commercial cattle slaughtered in Utah during those years (Table 3).

Utah carcass exports are shipped to either the Los Angeles area or the San Francisco area. Los Angeles imports 72 percent and San Francisco 28 percent of the carcass beef exported to the state of California.

The major outlets for exported beef are wholesalers or breakers. These are large-volume distributors handling beef almost exclusively and

engaged primarily in breaking carcasses into the type and weight of beef that can be merchandized most profitably as wholesale cuts. Other outlets are retail chains and jobbers. The jobber is a meat distributor engaged primarily in servicing restaurants, hotels, and other dining establishments.

Table 3. Commercial cattle slaughter, 1965-1969

Year	Head #1000	Average Live Weight	Total Live Weight in millions of pounds	Carcass Weight in millions of pounds
1965	293.6	1026	301.2	174.7
1966	321.8	1012	235.7	188.9
1967	271.0	1001	271.3	157.4
1968	277.1	1001	277.4	160.9
1969	273.7	1034	283.0	164.2

Source: Livestock Slaughter, Statistical Reporting Service United States Department of Agriculture.

Utah meat packers exported about 90 percent of their meat in hung carcass form. The remainder was exported as primal cuts. The packers interviewed indicated that exports as primal cuts will become more important in the near future. The quantities and grades of carcass beef exported were unavailable. There is some cow beef exported. However, the bulk is choice steer, good steer, and choice heifer beef.

There are fifty-three meat packers in the state of Utah. Only four account for the export of carcass beef to California. Two of these four, export over 95 percent of the total. This is well over 50 percent of their cattle slaughter.

It should be realized that California continues to import some cattle ready for slaughter, although this type of movement has decreased from 62,000 head in 1957 to 11,000 head in 1966 (Table 4). If the decreasing trend continues through 1969 an estimated 6,000 head of ready to slaughter cattle would be exported to California. This number of cattle would be equivalent to approximately an additional 3.5 million pounds of carcass beef.

Table 4. Cattle and calves: Number shipped into California for immediate slaughter from Utah, 1957-1966

Year	# Thousand head
1957	62
1958	51
1959	54
1960	36
1961	21
1962	18
1963	14
1964	19
1965	16
1966	11

Source: California Annual Livestock Report, California Crop and Livestock Reporting Service.

Other States

Nevada, Wyoming, Arizona, and Idaho are the only other states importing carcass beef from Utah. Nevada is by far the largest importer of this group. In 1968, Nevada imported eight million pounds compared to one million pounds to Wyoming, 215,000 pounds to Arizona and 108,000 pounds to Idaho.

Nevada is next in rank to California importing 5 percent in 1968 and 6 percent in 1969 of the commercial cattle slaughter of Utah.

Relatively few meat packers (5 of 53) account for the export to these states. In most cases the packers exporting were located very close to the border of the importing state.

UTAH PRICE CORRELATIONS WITH CALIFORNIA PRICES

Linear regression analysis was used to determine price correlations between various grades and classifications of slaughter cattle. Utah choice and good steer, and choice heifer prices (auction and direct sale) were compared to the Los Angeles choice and good steer and choice heifer dressed meat market prices. Utah choice and good steer prices (auction and direct sale) were compared to the San Francisco choice and good steer dressed meat market prices.

The mathematical model used to make the above comparisons was:

$$Y = bo + b_1 X \qquad (1)$$

where:

Y = Utah price
bo = Y intercept
b_1 = slope of the function
X = Los Angeles or San Francisco price

The correlation index was recorded for each comparison previously mentioned (Table 5). The correlation index (R^2) shows the percentage of the variation between the two markets which is explained by the model. If the variables are highly associated or correlated, the correlation index will be high, close to one. Similarly, if the model fits poorly, the correlation index will be close to zero, reflecting a low correlation.

Prices usually change in the consumption area before there is a change in the production area. It would be expected, therefore, that a price

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[1]The variables are reversed from the equilization theory model which is to follow, in order that Utah's slaughter prices could be easily determined.

change in the Utah slaughter cattle market would follow a change in the California dressed meat market. In order to determine the time interval of a change in these markets, Utah slaughter cattle prices were compared with week advances in the San Francisco and Los Angeles dressed meat market. The week advance having the highest correlation index would be the time interval of a change in the markets.

Table 5. Correlation index of the various classifications and grades of slaughter cattle, 1965-1969

	Choice Steer	Good Steer	Choice Heifer
(a) Utah auction prices and Los Angeles dressed meat market prices.			
No lag	.886	.369	.396
One week lag	.893	.362	.605
Two week lag	.867	.345	.837
Three week lag	.837	.314	.815
(b) Utah direct sale prices and Los Angeles dressed meat market prices.			
No lag	.936	.328	.899
One week lag	.916	.316	.911
Two week lag	.880	.291	.886
(c) Utah auction prices and San Francisco dressed meat market prices.			
No lag	.890	.823	
One week lag	.894	.830	
Two week lag	.866	.824	
Three week lag	.821	.790	
(d) Utah direct sale prices and San Francisco dressed meat market prices.			
No lag	.931	.600	
One week lag	.919	.857	
Two week lag	.880	.827	

Correlation of Utah Auction Prices and Los Angeles Prices

Choice steer and choice heifer market prices are highly correlated between Utah live cattle prices and California dressed meat prices. The good steer market has a low correlation index.

The highest correlation index for the choice steer market occurred with a one week lag. The index was .893. This means that the mathematical model accounts for 89.3 percent of the price variation between the Los Angeles choice steer dressed meat market and the Utah choice steer slaughter cattle market. Utah producers could determine this weeks price change in the Los Angeles market and expect a related price change in the Utah choice steer market for the coming week.

To illustrate, suppose for consecutive weeks in Los Angeles the choice steer dressed meat prices were $20 and $30 per 100 weight. Making a difference of $10 per 100 weight. The same two weeks in the Utah choice steer slaughter cattle prices were $10 and $20 per 100 weight. The difference was also $10. Now suppose the price during the third week in Los Angeles was $35. For a correlation index of one the price difference between consecutive weeks in the two markets would be the same. The price in Utah would be $25 per 100 weight. Using the correlation index of .893 in the above example, the actual change in the Utah price would be $10 from the first to second week and $5 from the second to and third week, but the mathematical model would indicate a price change of only $8.93 and $4.47 respectively.

A two week lag in the choice heifer market had the highest correlation index of .837.

The correlation index for the good steer market was .369. Very little variation in the price variables was accounted for by the model.

The reasons for the poor correlation could be that only a small amount of good steer beef is exported to Los Angeles. The quantity which is exported could be sold as primal cuts and in this case the good steer prices would not be expected to highly correlated. It is also possible that consumer preference in Utah is very high for good steer beef and most of the good steer slaughter cattle are demanded by the packers who market their meat in-state.

Correlation of Utah Direct Sale Prices and Los Angeles Prices

Like the auction market price correlations the choice steer and choice heifer direct sale market prices are highly correlated and the good steer market prices are poorly correlated. The choice steer market correlation index was highest at .936, with no time lag; the choice heifer market was highest at .911, with a one week lag; and the good steer market was highest at .328, with no time lag.

The time lags in the choice steer and heifer direct sale market are one week less than the time lags in the choice steer and heifer auction market. This indicates that the direct sale market reacts a week faster to price changes in Los Angeles, than the auction sale market.

The correlation index for the direct sale market is higher than the correlation index for the auction sale market. For example, the weeks with the highest R^2 in the choice steer and heifer direct sale market had R^2's of .936, and .911 compared with .893 and .837 in the choice steer and heifer auction sale market. The variables in the direct sale market have 4.3 and 7.4 percent more association than the variables in the auction sale market.

The fact that the direct sale market reacts a week faster to price change and is higher in correlation than the auction sale market

would indicate that the producers who sell direct and have a better understanding of market conditions and are receiving a fairer price for their slaughter cattle.

Correlation of Utah Auction and Direct Sale Prices and San Francisco Prices

Choice steer prices and good steer prices are highly correlated with an index for identical weeks of .890 and .823 in the auction market and .937 and .860 for identical weeks in the direct sale market. The highest correlation occurred in the auction market with a one week lag and a R^2 of .894 for choice steers and .820 for good steers. The highest correlation in the direct sale market was with identical weeks, indicating no time lag in the choice and good steer direct sale market.

The correlation between Utah prices and San Francisco prices has a one week less lag in the direct sale than the auction sale market. Also the direct sale market is higher in correlation than the auction sale market.

An interesting phenomena that occurs with the comparison of Utah and San Francisco prices is that the good steer market is highly correlated. Unlike the comparison of Utah with Los Angeles prices having a R^2 in the 30 percent range, the comparison of Utah and San Francisco prices has an R^2 in the 80 percent range. This indicates that the good steer markets for Ogden and San Francisco have a similar demand and supply structure, and possibly meat packers export most of the good steer slaughterings to San Francisco.

PACKER COSTS AND MARGINS

Market Equalization Theory

The process of market equalization means that the net price for a product is the same throughout the market system. Net price is the market price minus all costs of storage, transportation, and processing.

In the United States, livestock production has developed in specialized geopraphical areas. High production areas are not necessarily high consumption areas. This produces surplus and deficit areas. The forces of supply and demand cause a movement of livestock from surplus areas to deficit areas. In perfect competition, the cost of livestock in deficit areas will be equal to the cost of the livestock in surplus areas plus transportation, storage, and processing from surplus areas to deficit areas.

In the long run, prices appear to comply with this theoretical concept quite well. In the short run, however, prices fluctuate considerably. Forces of supply and demand in a specific geographic area tend to make prices volatile. It becomes very important, therefore, for producers and meat packers to have an understanding of any price variations that occurr and any price pattern which may exist in the market area where they operate.

Market Equalization Model

A mathematical model was formulated to equate slaughter cattle prices in Utah with the California dressed meat market prices for cattle. The model is:

$$Y = \frac{1}{A}(X_1) + X_2 + X_3 - X_4$$

where:

Y = price per 100 pounds of carcass beef in California
A = dressing percentage coefficient
X_1 = price per 100 pounds of fat slaughter cattle in Utah
X_2 = cost of buying and slaughtering per 100 pounds of carcass beef in Utah
X_3 = cost of transporting per 100 pounds of carcass beef from Utah to California
X_4 = value of the by-products per 100 pounds of carcass beef in Utah

Dressing percentage coefficient

The amount of carcass beef obtained from slaughtering individual animals varies. There are averages used by different institutions for the various grades of slaughter animals.

The dressing percentage coefficients used in the study are:

Choice steers[2]	60 percent
Choice heifers	60 percent
Good steers	58 percent

Transportation costs

Carcass beef exports to California are either transported by commercial freight line or by packer owned trucks.[3] Of the four meat packers exporting carcass beef to California, two export commercially and two use their own trucks. The two independent packers export a large percentage of their own kill to California and export consistently each week. Over 95 percent of all carcass beef exports to California are handled by these two packers. California is not a major outlet for

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[2]The dressing percentage coefficients were reported by those meat packers interviewed. The dressing percentage of .58 appears in many U.S. Dept. of Agr. publications.

[3]To avoid the constant repetition of the phrase "packers using their own trucks" the phrase "independent packers" or "packer exporting independently" will be used in this thesis.

the other two packers, who export occasionally when a surplus occurs and when a competitive advantage arises.

Commercial freight costs from the Salt Lake-Ogden vicinity to the Los Angeles-San Francisco areas are:

40,000 pounds[4]	$1.18 per 100 weight
38,000 pounds	$1.66 per 100 weight
30,000 pounds	$1.77 per 100 weight
23,000 pounds	$1.90 per 100 weight

A cost of $1.18 per 100 pounds of carcass beef will be used in this study as transportation cost of carcass beef exported commercially from Utah to California.

Transportation costs reported, in 1969, by meat packers exporting carcass beef independently to California ranged from $0.35 to $0.40 per running mile. In 1963, Elizabeth L. Murphy reported that the cost of carriers transporting non-manufactured agricultural products and livestock was $0.32 per running mile (Table 6). This figure would be equivalent to the $0.35 to $0.40 reported by Utah meat packers when inflation and the difference in weight of freight hauled are considered. The haul of the independent packers would range very close to 40,000 pounds, whereas the freight transported by the carriers sampled by Murphy averaged only 29,000 pounds per load (6, p. 20). A round trip transportation cost for meat packers exporting carcass beef independently would range from $1.31 to $1.50 per 100 pounds of carcass beef.[5]

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[4]Interviews with five major freight lines in Salt Lake City.

[5]These costs were determined by the following equation:

$$TC = \frac{C \cdot D}{W}$$

Where:
TC = transportation cost per 100 pounds of carcass beef
C = cost per running mile
D = distance in miles
W = weight of carcass beef per load in 100 pounds

The distance from Salt Lake to Los Angeles is 743 miles and the distance

Table 6. Truck carriers of non-manufactured agricultural products, livestock and fish 1963

Items	Unit	Carriers
Carriers	Number	11,369
Total operating revenue from motor carriers	Million dollars	510
Total expense of motor Carrier operating	Million dollars	520
Operation ratio	Percentage	91
Vehicles		
Straight truck	Thousand dollars	19.8
Truck tractor	"	18.5
Full trailer	"	2.3
Averages		
Revenue per vehicle mile	dollars	.35
Cost per vehicle mile	"	.32
Profit per vehicle mile	"	.03
Revenue per ton carried	"	1.72
Cost per ton carried	"	1.57
Profit per ton carried	"	.15

Source: Motor Carrier Survey p. 809 and Interstate Commerce Commission Selected Statistics of Class III Motor Carrier of Property, 1963, Statement number 6505 (September 1965)

Printed from "A Comparison of Small Truck Carriers" by Elizabeth L. Murphy.

Independent meat packers have back-haul contracts which must be considered in their transportation costs. Elizabeth Murphy reported that

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from Salt Lake to San Francisco is 752 miles. This makes a round trip of 1486 miles from Salt Lake to Los Angeles and 1504 miles from Salt Lake to San Francisco. Only one distance figure will be used in this study, 750 miles. The reason for this is because the commercial freight is quoted as one figure and the exact distinctions in the Los Angeles and San Francisco vicinities are unknown.

carriers of non-manufactured agricultural products made a profit of $0.03 per running mile (6, p. 20). If no profit or loss is considered on the back-haul of the independent packers, that is all costs are covered by revenues, the transportation cost for the independent packer would range from $0.65 to $0.75 per 100 pounds of carcass beef.[6]

Transportation costs of $1.18 for meat packers exporting commercially and $0.75 for meat packers exporting independently will be used in this study.

Slaughtering costs

In 1968, the average operating expense for slaughtering reported by three of the four meat packers exporting carcass beef to California was $3.23 per 100 pounds of dressed beef.[7] Slaughtering costs for 1967 and 1969 were unavailable. Cost of slaughter was determined for these years in the following manner. A study by Donald B. Agnew showed that labor accounted for almost 50 percent of the total operating costs of packers (Table 7). Gross average earnings of laborers in manufacturing industries increased 6.6 percent in 1967 and 3.4 percent in 1969 (10, p. 277). Considering labor cost for meat packers in 1968 to be $1.60 per 100 weight of carcass beef and a 6.6 and 3.4 percent increase in labor costs, the slaughtering cost for 1967 would be $3.13 per 100 pounds of carcass beef and for 1969, $3.28 per 100 pounds of carcass beef.

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[6]These costs were obtained by using the model:

$$TC = \frac{C \cdot D}{W}$$

The cost per running mile being $0.35 and $0.45; the distance being 750 miles; and the weight being 400 pound weights of carcass beef.

[7]This figure was reported as all operating expenses and would consist of procurement costs, wages, expenses and salaries, supplies, taxes, depreciation, and other miscellaneous expenses. These costs will be referred to in this study, as slaughtering costs.

Table 7. Costs of meat packer's fresh beef operations, per 100 pounds of dressed beef, fall and winter 1962-1963

Item	Oct. - Dec. 1962	Jan. - March 1963
Labor	1.56	1.50
Grading	.20	.19
Procurement and selling	.39	.38
Fixed plant and adminsitration	.99	1.03
Total operating costs	3.14	3.10

Source: Meat Packers' Cost and Spread, prepared by Donald B. Agnew, Marketing Economic Division.

An average procurement cost of $0.42 per 100 pounds of carcass beef is included in the yearly cost of slaughter. This is assumed to be the cost of buying cattle at local auctions.

An analysis of the direct sale market was conducted in this study. Therefore, it is important to determine the effect that buying direct has upon cost of slaughter. Wilson, Price and Phillips reported that the cost of buying cattle directly from feed lots was $0.23 per 100 pounds of carcass beef compared to $0.38 if purchased at local auctions and $0.46 if purchased at terminal markets (10, p. 26-28). Considering the above relationship between purchasing cattle directly and buying cattle at local auctions a decrease of at least $0.18 cents in slaughtering costs can be obtained by meat packers if slaughter animals are procured directly from the producer. When direct sale calculations are made, slaughter costs of $2.95, $3.02 and $3.10 will be used for the years 1967, 1968 and 1969.

By-product values

Price quotations for hides and offal are based on current market values of finished products as well as general economic indicators in the market. Unless packing plants have rendering facilities of their own, the value meat packers recieve for their by-products is very much distated by the renderer because the supply of by-products is determined by livestock slaughtered.

Hide and offal value estimates used in this study were supplied by the United States Department of Agriculture. These are estimates for the mid-West and Western portions of the United States. Time series of values were available from 1967 to date. Price quotations are per 100 pounds of live weight for the average 1,000 pound steer. Hide and offal values were transferred to dressed meat equivalents by dividing by the dressing percentage coefficient.

Packer Margins

Weekly gross and net margins

Weekly gross and net margins were calculated for the various classifications and grades of slaughter cattle (Figure 1-10). The gross margin is the difference between the price that the Utah packers pay for slaughter cattle in carcass weight and the price he sells his carcass meat for in California. The net margin is the gross margin minus all costs of slaughtering and transportation. The net margin, when the market equalization model is used is the difference between the calculated California price for a particular classification and grade of dressed meat and the actual California dressed meat price.

The net margins were computed using the cost structure of both the meat packer exporting commercially and those exporting independently.

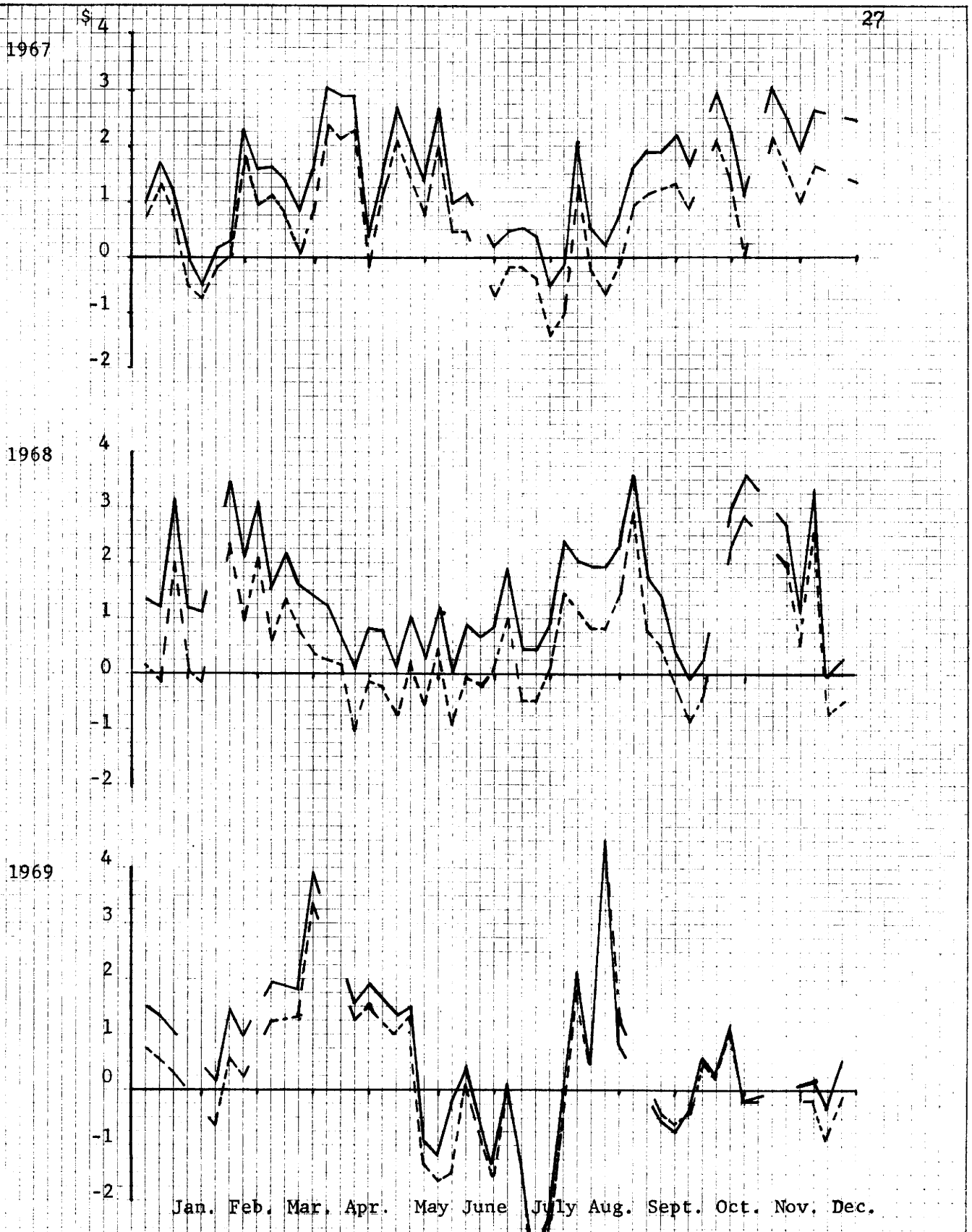

Figure 1. Weekly gross and net margins, Utah choice steer auction prices and Los Angeles dressed meat market prices.

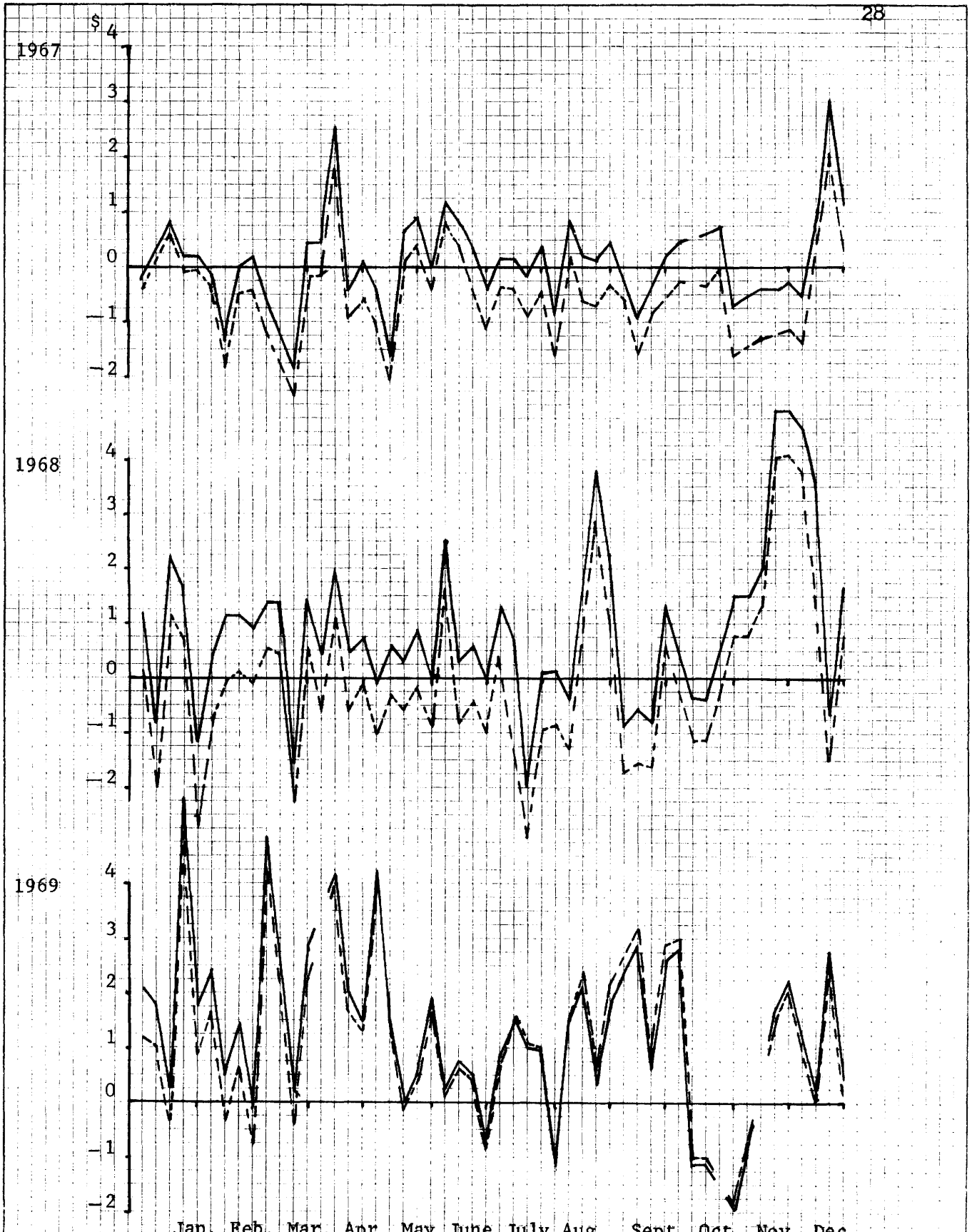

Figure 2. Weekly gross and net margins, Utah good steer auction prices and Los Angeles dressed meat market prices.

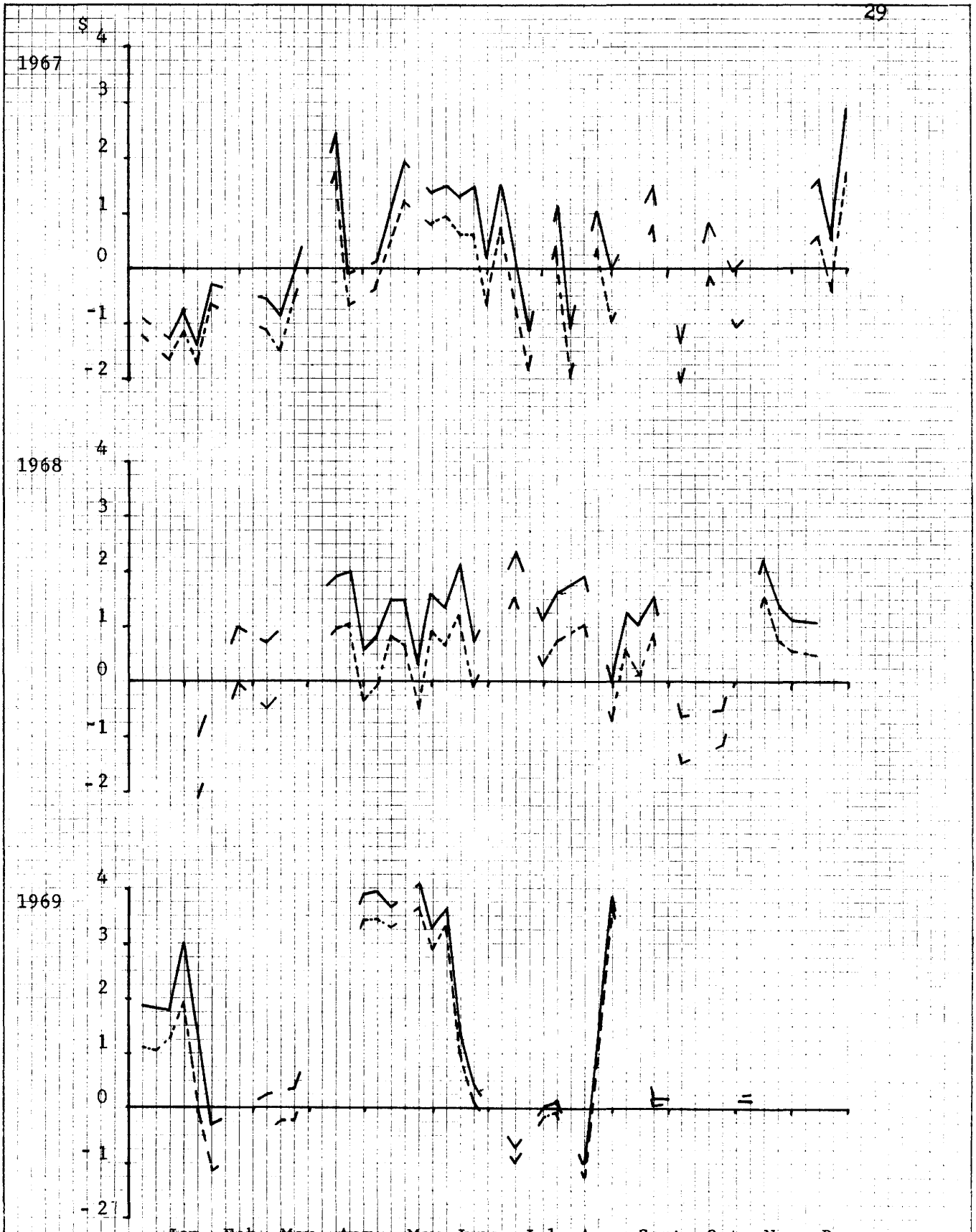

Figure 3. Weekly gross and net margins, using Utah choice heifer auction prices and Los Angeles dressed meat market prices.

Gross ————

Net – – – – –

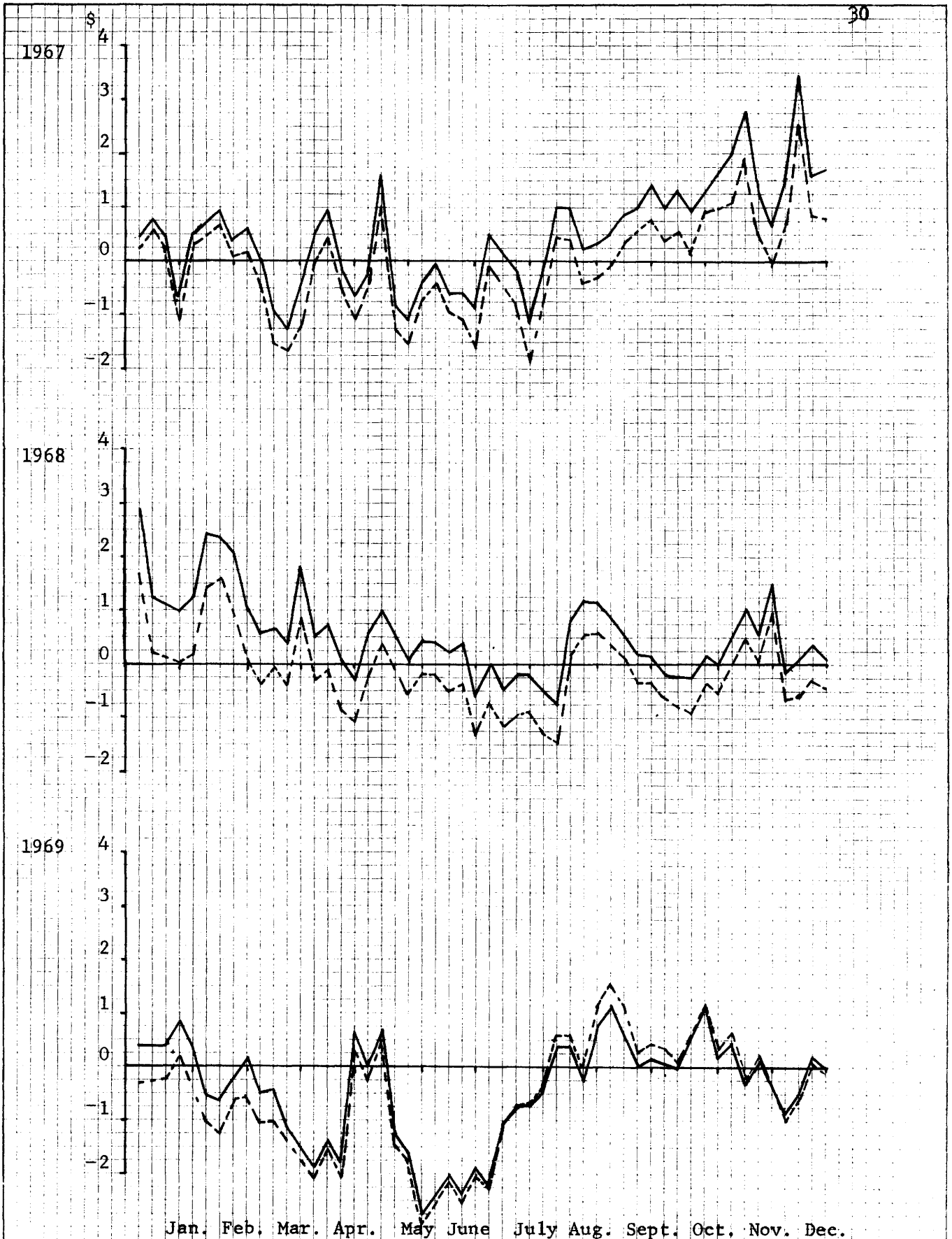

Figure 4. Weekly gross and net margins, Utah choice steer direct sale prices and Los Angeles dressed meat market prices.

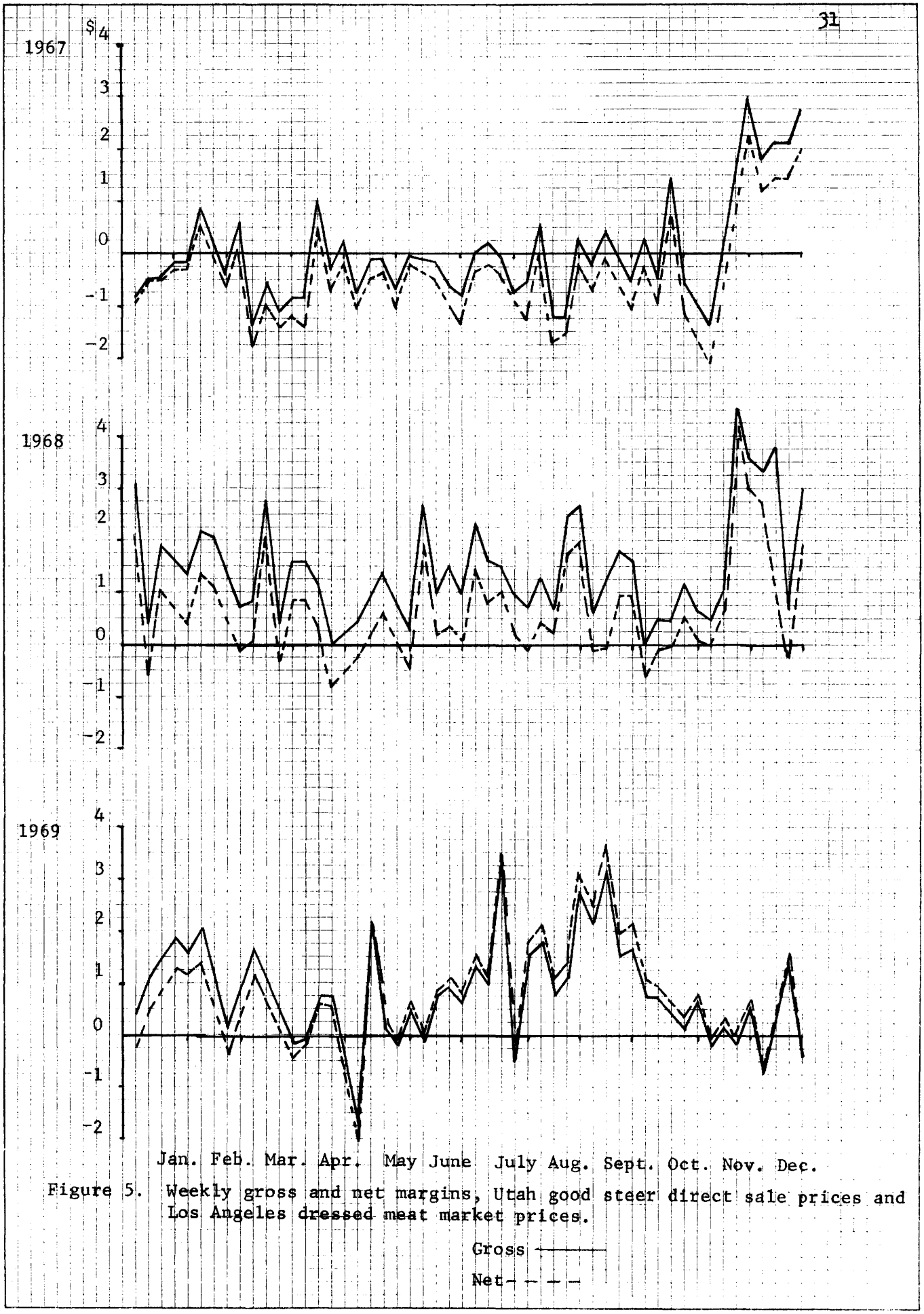

Figure 5. Weekly gross and net margins, Utah good steer direct sale prices and Los Angeles dressed meat market prices.

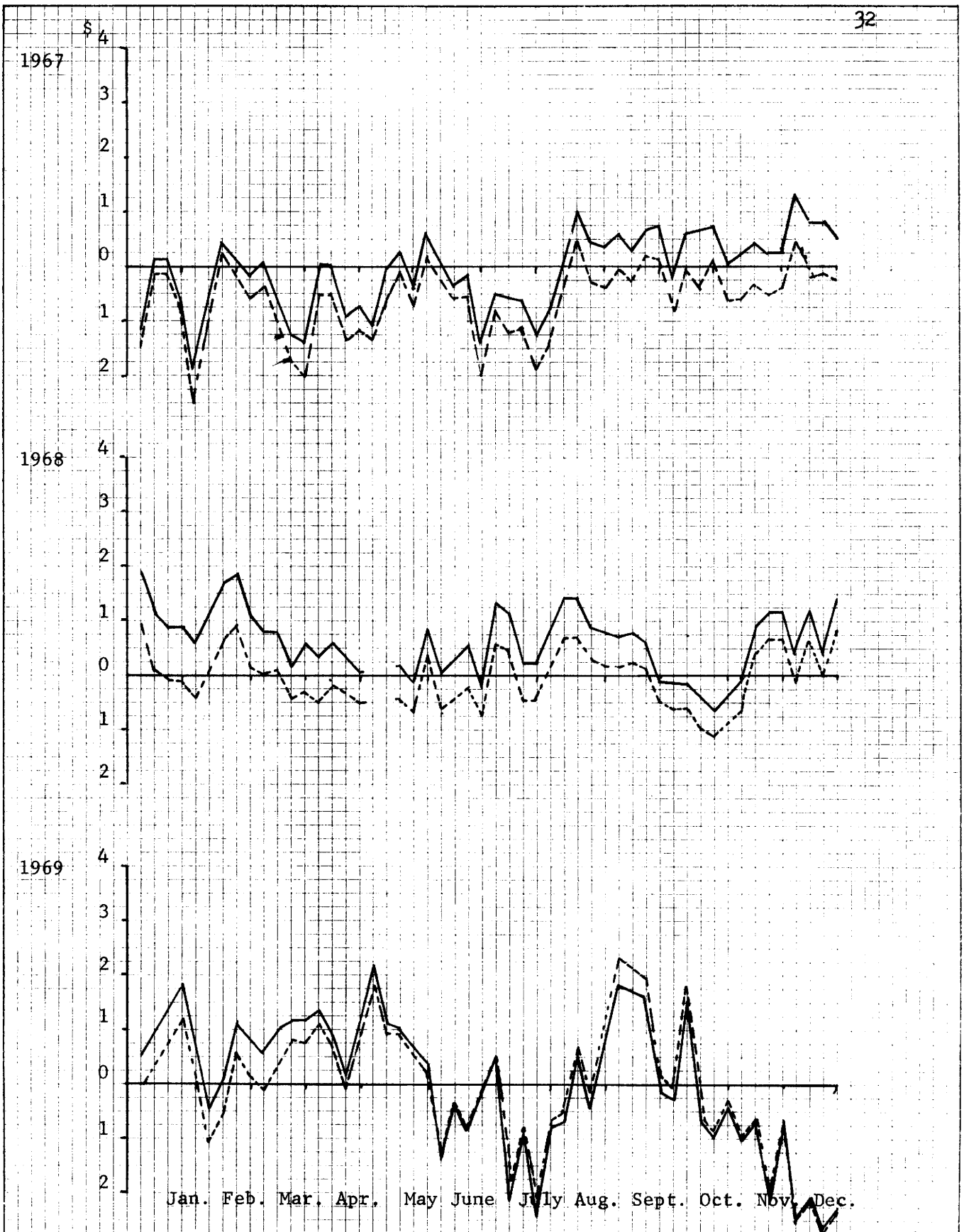

Figure 6. Weekly gross and net margins, Utah choice heifer direct sale prices and Los Angeles dressed meat market prices.

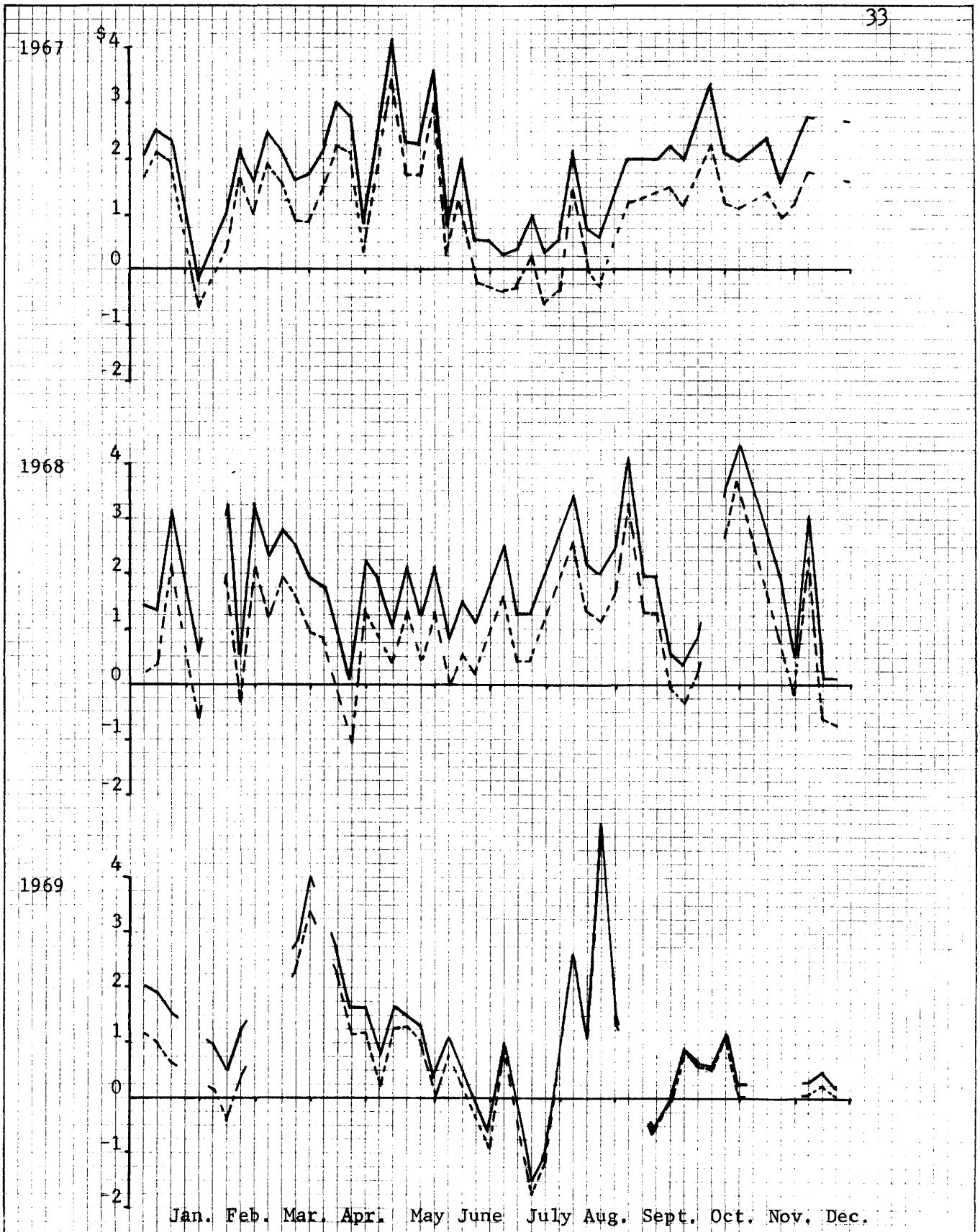

Figure 7. Weekly gross and net margins, Utah choice steer auction prices and San Francisco dressed meat market prices.

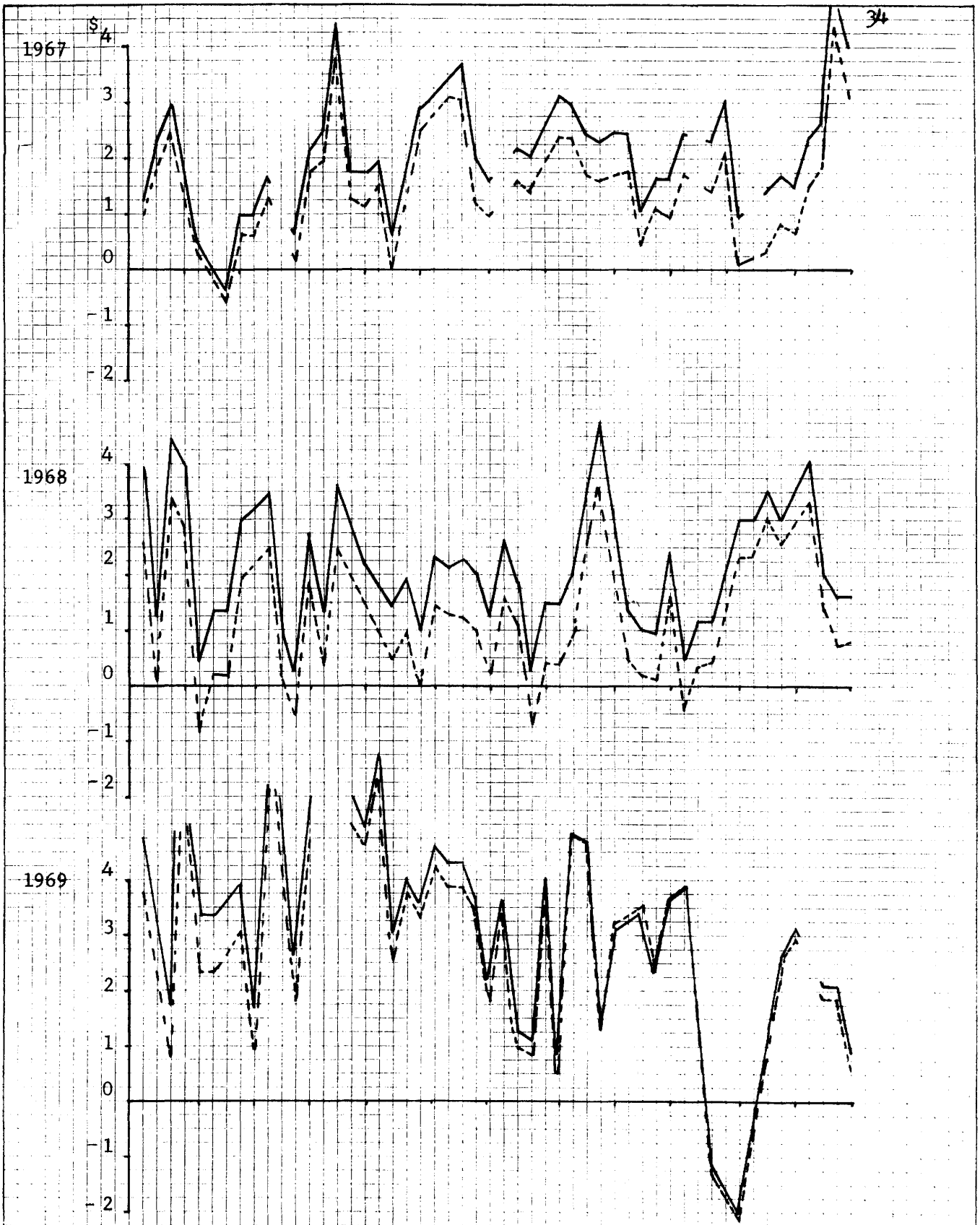

Figure 8. Weekly gross and net margins, Utah good steer auction prices and San Francisco dressed meat market prices.

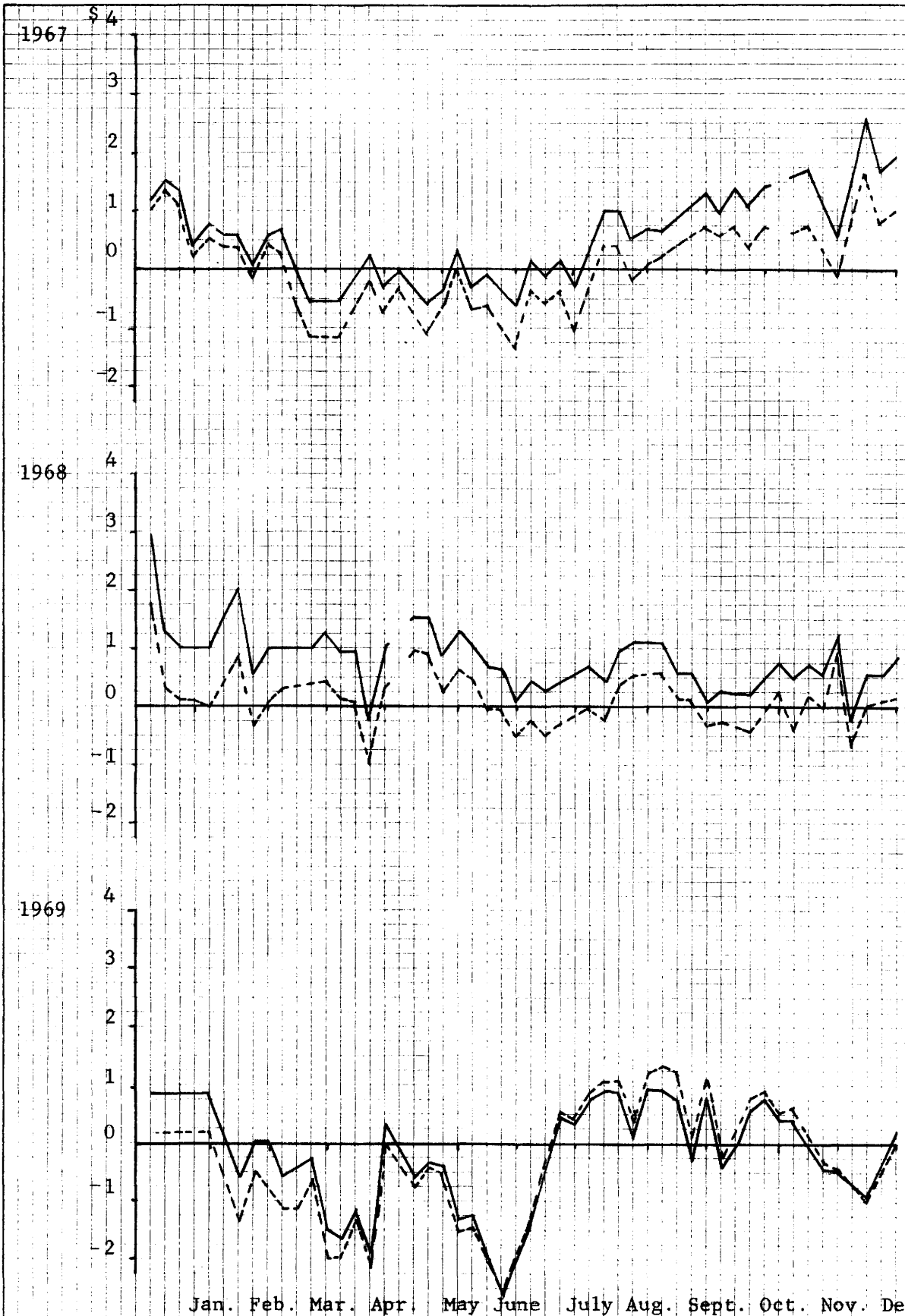

Figure 9. Weekly gross and net margins, Utah good steer direct sale prices and San Francisco dressed meat market prices.

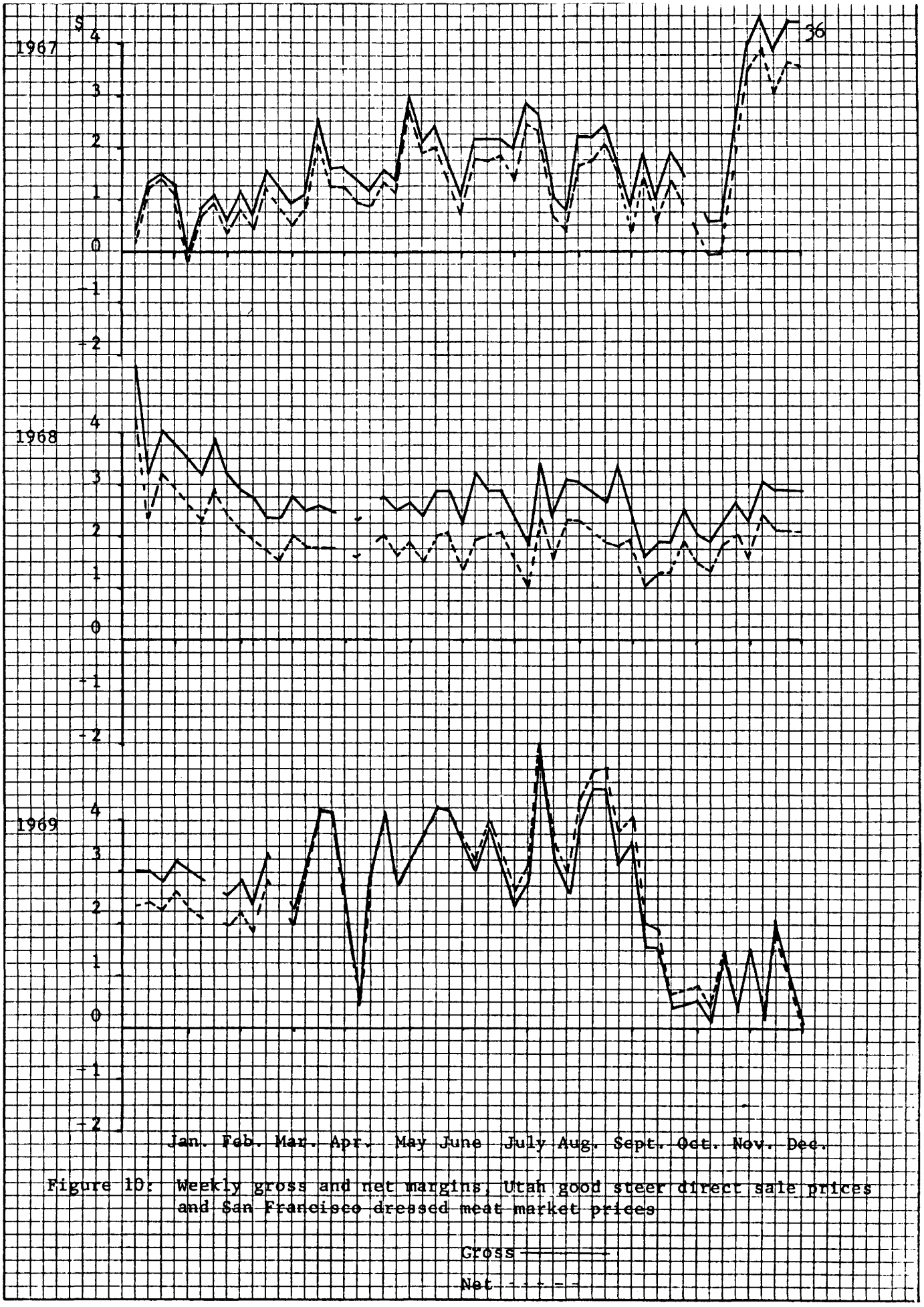

Figure 10: Weekly gross and net margins, Utah good steer direct sale prices and San Francisco dressed meat market prices

For clarity, only, the net margin for those meat packers exporting independently are indicated in the following figures. Meat packers exporting commercially had a cost structure of $0.43 greater than independent packers. Graphs of net margins for commercial packers would be a constant $0.43 below graphs for independent packers.

Packers net and gross margins fluctuate greatly. There appears to be very few time patterns evolving. The major pattern which is noticeable is that the difference between gross and net margins tend to increase and then decrease from 1967 to 1969. During the last six months in 1969 the net margin was greater than the gross margin, indicating that the value of the by-products was greater than the costs of slaughtering and transportation.

Yearly gross and net margins

Packers yearly gross and net margins were calculated for the various classifications and grades of slaughter cattle (Table 8).

Analysis of Packer Margins

Yearly gross and net margins for various classifications and grades of slaughter cattle are average figures for the year. Because weekly gross and net margins fluctuate greatly, meat packers who export occasionally to California can take advantage of the market situation and export only when the gross and net margins are above averages for the year. Packers who do this can make much higher profits than are indicated in the analysis.

Choice steer auction prices and Los Angeles prices

Meat packer's gross margins for choice steers were positive for all years of the time series, varying from a high of $1.49 in 1968 to a low

Table 8. Packer's yearly gross and net margins per 100 pounds of carcass beef

Year	Gross Margin	Net Margin (commercial trans.)	Net Margin (independent trans.)
(a)	Utah choice steer auction prices and Los Angeles prices		
1967	1.45	.31	.74
1968	1.49	.15	.58
1969	.67	.03	.46
(b)	Utah good steer auction prices and Los Angeles prices		
1967	.11	-.93	-.50
1968	.93	-.43	0
1969	1.33	.60	1.03
(c)	Utah choice heifer auction prices and Los Angeles prices		
1967	.38	-.70	-.26
1968	1.09	-.21	.22
1969	1.53	.72	1.15
(d)	Utah choice steer direct sale prices and Los Angeles prices		
1967	.46	-.49	-.06
1968	.57	-.59	-.16
1969	-.43	-.86	-.43
(e)	Utah good steer direct sale prices and Los Angeles prices		
1967	-.01	-.87	-.44
1968	1.43	.24	.67
1969	.80	.40	.83
(f)	Utah choice heifer direct sale prices and Los Angeles prices		
1967	-.08	-1.06	-.63
1968	.63	-.43	0
1969	.03	-.40	.03
(g)	Utah choice steer auction prices and San Francisco prices		
1967	1.67	.52	.95
1968	1.81	.44	.87
1969	1.09	.39	.82

Table 8. Continued

Year	Gross Margin	Net Margin (commercial trans.)	Net Margin (independent trans.)
	(h) Utah good steer auction prices and San Francisco prices		
1967	2.05	.91	1.34
1968	2.19	.89	1.32
1969	3.26	2.66	3.09
	(i) Utah choice steer direct sale prices and San Francisco prices		
1967	.67	-.33	.10
1968	.88	-.27	.16
1969	-.10	-.62	-.19
	(j) Utah good steer direct sale prices and San Francisco prices		
1967	1.83	.97	1.40
1968	2.82	1.56	2.00
1969	2.75	2.25	2.68

of $0.67 in 1969. Meat packers exporting commercially in 1969 had a low $0.03 net margin compared to $0.46 net margin for packers exporting independently. Earnings of $0.31 and $0.74 would have been made in 1967 by the two packers respectively.

Good steer auction prices and Los Angeles prices

Packer's gross margin for this market increased for all years of the time series, from $0.11 in 1967 to $1.33 in 1969. Meat packers exporting commercially in 1967 and 1968 would have incurred large losses but would have shown substantial earning of an average of $0.60 in 1969. Independent packers, in 1969, would have made an average profit of $1.03.

Choice heifer auction prices and Los Angeles prices

The choice heifer auction market followed the same pattern as the good steer auction market. The average earnings in 1969 were $0.72 and $1.15 respectively for the packers exporting commercially and independently.

Choice steer direct sale prices and Los Angeles prices

Net margins for both the packer exporting commercially and independently were negative for all years of the time series. Packers could not afford to slaughter choice steers and export the meat to Los Angeles if the cattle were bought directly from the feeder. The reason was meat packers had to pay a higher price for choice steers bought directly from the producer than for choice steers bought at the auction market. The net margins in 1969 were -$0.86 for packers exporting commercially and -$0.43 for packers exporting independently.

Good steer direct sale prices and Los Angeles prices

In 1968 and 1969 the independent packer would export good steer carcass meat to Los Angeles and make a profit of $0.67 and $0.83 respectively. The gross margins for independent packers in 1968 were $1.43 and $0.80 in 1969.

Choice heifer direct sale prices and Los Angeles prices

For meat packers to buy choice heifers directly from the feeder, pay the average price, and export the choice heifer carcass meat to Los Angeles would prove unprofitable in 1969. The net margin in 1969, for meat packers exporting independently was only $0.03. In the same year the net margin for the packer exporting commercially was -$0.40.

Choice steer auction prices and San Francisco prices

Net margins for independent packers in 1967, 1968 and 1969 were $0.95, $0.87 and $0.82 respectively. Excellent profit could have been made by all packers during the three year time series.

Good steer auction prices and San Francisco prices

The gross margins for this market were higher than all other markets, having during the three year time series values of $2.05, $2.19 and $3.26. The net margins for independent packers were $1.34, $1.32 and $3.09. Packers exporting commercially would also make large profits of $0.91, $0.89 and $2.66.

Choice steer direct sale prices and San Francisco prices

Net margins, in 1969, for both independent packers and commercial packers were negative. Independent packers would lose $0.19 per 100 pounds of carcass beef if they exported choice steer carcass meat to San Francisco and bought their animals directly from the cattle producers.

Good steer direct sale prices and San Francisco prices

Purchases in the good steer direct sale market would be very profitable for the meat packer. Profits of $1.40, $2.00 and $2.68 would have been made by the independent packer in 1967, 1968 and 1969. The packer exporting commercially would have made for the same time period $0.97, $1.56 and $2.25.

General Conclusions of Packer Gross and Net Margins

In the future larger quantities of carcass meat will be exported to San Francisco if a market is available in that city for Utah carcass beef. The San Francisco outlet for Utah meat was more profitable than the Los Angeles market. The overall average net margin for the choice steer

market (auction and direct sale) for the three year time series was $0.19 for the Los Angeles market and $0.46 for the San Francisco market. Choice meat exported to San Francisco would return $0.27 more per 100 pounds than if exported to Los Angeles. The good steer market had an average net margin of $0.27 for Los Angeles and $1.97 for San Francisco. The choice heifer market for Los Angeles had an average net margin of only $0.09.

Producers who sell directly to the meat packer receive a higher price for their choice steer and heifer slaughter cattle than if the cattle were sold at auction markets. Meat packers can make more profit by buying choice steers and heifers from the auction market than if they bought directly from producers. For choice steers, the average auction sale net margin for Los Angeles and San Francisco was $0.67 compared to a -$0.07 for the direct sale market. For choice heifers, the average net margin for Los Angeles was $0.39 for the auction market and a -$0.20 in the direct sale market. The direct sale margin was higher than the auction sale margin for the good steer market, as a margin of $1.19 and $1.05 was calculated.

UTAH PRICE CHANGES

Market equalization theory suggests that the net price for a product is the same throughout the market system. The net price is adjusted to allow firms performing a service in the market channels an average profit of the industry. Prices in a specified geographical area do not always follow this theoretical concept. Market concentration (the percent of total sales controlled by the larger firms in the industry) tends to increase as a product moves from the production area to the consumption area. The more concentrated a market the greater the tendency towards imperfect competition and price control.

It is important therefore to determine what price changes can be made in the Utah slaughter cattle market and still allow the concept of market equalization to exist.

Wilson Pence and Phillips in 1958 reported that meat packers net earnings were 0.7 percent of total sales or 2.8 percent of the gross margin (Table 9). Later statistics published by the American Meat Institution showed that earnings as a percent of total sales for the year 1947-1968 averaged .8 percent. This was equivalent to $0.41 per 100 pounds of dressed meat. From 1959-1968 the average earning per 100 pounds of dressed meat was 44 cents (Table 10). The average net earning of $0.44 per 100 pounds will be used in this thesis in determining price changes in the Utah slaughter cattle market.

The average changes in Utah prices necessary for Utah meat packers to obtain the average profit for the meat packing industry were calculated for the various classifications and grades of slaughter cattle (Table 11). In determining Utah price changes, average packer earnings for the industry were subtracted from the average net margin for Utah meat packers. The

Table 9. Distribution of meat packing industry's sales dollar, 1951-1958

Items	Percent of sales	Percentage of Packers gross margin
Total sales	100.0	
Cost of livestock and other materials	75.4	
Gross margin	24.6	100.0
Operating expenses		
Wages and salaries	12.0	48.8
Supplies and containers	3.9	16.1
Transportation	2.5	10.1
Taxes	1.2	4.8
Depreciation	.6	2.5
Interest	.2	.8
All other expenses	3.5	14.1
Total expenses	23.9	97.2
Total net earnings	.7	2.8

Source: Financial facts about the Meat Packing Industry Department of Marketing American Meat Institute, Chicago, July 1959.

difference was adjusted to live cattle prices. Just as there were two yearly net margins there were two price changes for each classification and grade of slaughter cattle depending on the cost structure used in the computations. Price changes when independent packers costs are used are approximately $0.25 higher per 100 pounds of slaughter cattle than price changes when the cost structure of packers exporting commercially are used.

It appears that live cattle prices should be changed according to the cost structure faced by the independent packer. The following evidence supports this agreement.

Table 10. Financial statement of the meat packing industry, 1959-1968

Year	Total Sales Million Dollars	Net Earning Million Dollars	Earnings as percent of sales	Earnings per 100 pounds Live Dressed	
1959	$13,275	$136	8.5	34	52
1960	13,225	110	6.7	26	40
1961	13,500	84	5.0	20	30
1962	13,975	112	6.7	26	40
1963	14,125	117	6.8	26	40
1964	14,550	166	9.5	34	52
1965	15,825	129	6.7	26	42
1966	17,850	120	6.4	24	39
1967	18,375	185	9.3	36	55
1968	19,150	175	8.6	33	51
1959-1968 Average	15,385	133	7.4	26	44

Source: 1968 Annual Report, American Meat Institute, Chicago, Ill. Printed from Feasibility of Expanding the Livestock Feeding and Meat Packing Industry in Utah.

As previously mentioned in this thesis, those meat packers who occasionally export carcass beef to California do so when the ne margin is above average. The average return for slaughtering exported meat to California for these companies would also be much higher than the average figure indicated.

For example, in 1969, the price change in the Utah choice steer auction market when compared with the Los Angeles dressed meat market for those meat packers exporting commercially was-$0.24 per 100 pounds of live slaughter cattle. If these packers exported a constant amount each week, they would not obtain the $0.44 net earning for the industry. Their net earnings would have been only three cents per 100 pounds of carcass beef. In reality, however, these meat packers export only occasionally when

Table 11. Average yearly Utah price changes, per 100 pounds of slaughter cattle, necessary for Utah meat packers to obtain the average profit of the meat packing industry, 1967-1969

Year	Price changes using commercial transportation	Price changes using independent transportation
(a) Utah choice steer auction prices and Los Angeles prices		
1967	-.08	.18
1968	-.17	.09
1969	-.24	.01
(b) Utah good steer auction prices and Los Angeles prices		
1967	-.79	-.54
1968	-.50	-.25
1969	.10	.35
(c) Utah choice heifer auction prices and Los Angeles prices		
1967	-.68	-.42
1968	-.39	-.13
1969	.17	.43
(d) Utah choice steer direct sale prices and Los Angeles prices		
1967	-.55	-.30
1968	-.62	-.36
1969	-.78	-.52
(e) Utah good steer direct sale prices and Los Angeles prices		
1967	-.76	-.51
1968	-.11	.14
1969	-.02	.23
(f) Utah choice heifer direct sale prices and Los Angeles prices		
1967	-.89	-.46
1968	0.52	-.26
1969	-.50	-.28
(g) Utah choice steer auction prices and San Francisco prices		
1967	-.05	.21
1968	0	.26
1969	-.03	.23

Table 11. Continued

Year	Price changes using commercial transportation	Price changes using independent transportation
(h) Utah good steer auction prices and San Francisco prices		
1967	.28	.52
1968	.26	.51
1969	1.29	1.54
(i) Utah choice steer direct sale prices and San Francisco prices		
1967	-.46	-.24
1968	-.42	-.21
1969	-.63	-.41
(j) Utah good steer direct sale prices and San Francisco prices		
1967	.31	.56
1968	.65	1.01
1969	0.05	1.35

Utah prices are low and the gross and net margins are high. If these meat packers exported carcass beef, the last week in March, they would have faced a gross margin of $4.00 and a net margin of $3.40. When compared to the yearly gross of $0.61 and net margins of $0.03, it is easily recognized that for this week meat packers would have made high profits. During July the margins were negative. It would prove unprofitable and unlikely that these packers would export carcass beef to Los Angeles during this month. Because the packers who export commercially do so when the margins are high, the profit obtained by these companies for exporting carcass beef to California would be higher than the average yearly profit figure quoted for those companies.

The companies exporting carcass beef weekly would face net returns similar to those indicated in the yearly averages.

Dr. Taylor reported, in 1968, that 68.5 percent of Utah cattle was slaughtered by eight meat packing firms. Two of these controlled 43.4 percent of the yearly slaughter (8, p. 163). Considering a total of 53 meat packing firms in the state, it would appear that the Utah meat packing industry is highly concentrated and involves imperfect competition to some extent.

The form of imperfect competition in which only a few buyers control a large share of the market is known as oligopsony. The oligopsonist is large enough to influence prices in the market place.

> This does not mean that the oligopsonistic firm always benefits from its position. During periods of comparative scarcity of supply (or very strong demand) a large individual buyer in a local market must pay increasingly higher purchases. On the other hand, such a buyer will be capable of depressing the local price if it restricts its purchase volume. (2, p. 9)

If oligopsonistic competition exists in the Utah meat packing industry it would be expected that meat packers would operate on both low and high margins. Weekly prices for slaughter cattle would be expected to fluctuate from extreme high and low positions as packers attempt to remain at the usual slaughter capacity.

In 1965, Utah meat packers controlled 7.5 percent of all slaughter cattle marketed. Packers themselves fed 6.5 percent of the slaughter cattle and controlled another one percent in associated interests. In other words, 9,400 of the 125,000 head of cattle slaughtered in Utah were fed by meat packers.

If the eight largest packing firms feed a large protion of the packer fed cattle, then the oligopsonist has further control of market prices.

The oligopsonist who is feeding cattle can transfer his own cattle for slaughter when supplies are low or demand is high and this acts as a bargaining tool for the meat packer.

The purpose of this paper is not to report on the competitive nature of the Utah slaughter market. However, when suggesting price changes, a knowledge of the competitive nature of the market system is extremely important.

Price Changes Analyzed

Utah auction market and Los Angeles market

In 1969, Utah slaughter cattle prices could have been increased $0.01 per 100 pounds of choice steers, $0.35 per 100 pounds of good steers, $0.43 per 100 pounds of choice heifers and still enabled Utah meat packers the average profit of the meat packing industry. Meat packers exporting choice steer carcass beef during 1967 to 1969 would have made more than the average profit of the industry. Meat packers exporting good steer and choice heifer carcass beef during 1967 and 1968 would not have made the average profit of the industry but would have made more than the average profit for the industry during 1969.

Utah direct market and Los Angeles market

Demand in the choice steer and heifer direct sales market was extremely high. Utah direct sales prices in 1969 for choice steer and choice heifer slaughter cattle needed to be decreased $0.52 per 100 pounds of choice heifers for meat packers to obtain $0.44 profit. Prices in the good steer market could have been decreased $0.46 in 1967, increased $0.14 in 1968 and increased $0.23 in 1969.

Utah auction market and San Francisco market

Utah meat packers exporting choice and good steer carcass meat to San Francisco could have made more than the average profit for the meat packing industry for all years of the time series. Utah prices could have been increased, in 1969, by $0.23 for choice steers and $1.54 for good steers and meat packers would have made the $0.44 profit.

Utah direct sale market and San Francisco market

Choice steer direct sale prices needed to be decreased in all years of the time series for Utah packers to make the average profit. Prices in the good steer direct sale market could have been increased. In 1969, good steer direct sale prices could have been increased $1.35 and enabled packers the $0.44 profit.

DETERMINATION OF UTAH SLAUGHTER CATTLE PRICES

There are two methods for cattle producers and feeders to predict Utah slaughter cattle prices. These methods are: (1) using the mathematical model of the linear regression analysis and (2) using the mathematical model for equalization theory.

Utah Price Predictions Using the Regression Analysis Model

Regression analysis provides values for the coefficients, bo and b_1 (Table 12). A prediction of Utah prices can be made by using the mathematical model ($Y = bo + b_1X$) with the coefficients of bo and b_1 for the week when the correlation index was the highest, and the Los Angeles or San Francisco price for the particular market being compared.

Suppose the Los Angeles choice steer market prices and the Utah choice steer auction prices are compared. There is a one week time lag in this comparison. Using the coefficients for bo and b_1 for this one week time lag and the Los Angeles dressed meat market price for a given week, a prediction of the Utah market price could be made. Suppose the week ending October 17, 1969 was chosen. Bo is -2.029, b_1 is 0.633 and the Los Angeles price is $45.00 per 100 pounds of carcass beef. When these values were used in the mathematical model a predicted price for Utah choice steers would be $26.48 for the week ending October 24, 1969. The actual value for that week was $26.37.

Using this method of calculation, Utah producers could have a prediction of next weeks market prices in Utah. The predicted values for the choice steer auction prices were calculated for 1969 (Table 13).

Table 12. Coefficient values of the gighest correlation index

Market	Time lag	Bo Value	B_1 Value
(a) Utah auction prices and Los Angeles dressed meat market prices*			
Choice Steer	One week	-2.029	0.633
Choice Heifer	Two week	4.470	0.489
(b) Utah direct sale prices and Los Angeles dressed meat market prices			
Choice Steer	No lag	-1.871	0.643
Choice Heifer	One week	0.741	0.483
(c) Utah auction prices and San Francisco dressed meat market prices			
Choice Steer	One week	-1.819	0.624
Good Steer	One week	4.217	0.456
(d) Utah direct slae prices and San Francisco dressed meat market prices			
Choice Steers	No lag	-1.480	0.270
Good Steers	No lag	4.545	0.448

*The coefficient values of the comparisons of Utah good steer prices and the Los Angeles good steer dressed meat market prices are not included in this analysis because of the poor correlation.

Utah Price Prediction Using the Market Equalization Model

Price predictions for Utah slaughter cattle can also be made using the following equation:

$$X_1 = A\ (Y - X_2 - X_3 + X_4 - X_5)$$

where:

X_1 = price per 100 pounds of fat slaughter cattle in Utah
A = dressing percentage coefficient
Y = price per 100 pounds of carcass beef in California
X_2 = cost of buying and slaughtering per 100 pounds of carcass beef in Utah

Table 13. Predicted price values for the choice steer auction market using the regression analysis model, 1969

Los Angeles Week ending		Price	Utah Auction Market Week ending		Predicted price	Actual price
December	27, 1968	$45.50	January	2	$26.79	$26.50
January	2, 1969	45.75		9	26.95	26.00
	9	45.75		16	26.95	26.80
	16	45.75		23	26.95	26.80
	23	46.25		30	27.27	26.52
	30	45.75				
			February	6	26.95	27.00
February	6	45.25		13	26.63	27.00
	13	45.50		20	26.79	27.00
	20	46.00		27	27.11	26.75
	27	46.75				
			March	6	27.58	27.00
March	6	47.00		13	27.74	27.00
	13	47.50		20	28.06	27.70
	20	48.00		27	28.38	27.00
	27	49.00				
			April	3	29.01	27.50
April	3	48.50		10	28.69	28.20
	10	49.50		17	29.33	28.40
	17	50.25				
			May	1	29.80	29.70
May	1	51.25		8	30.43	30.20
	8	51.75		15	30.75	31.30
	15	53.75		22	32.02	33.10
	22	54.25		28	32.33	33.10
	28	54.75				
			June	5	32.65	33.50
June	5	55.50		12	33.13	33.40
	12	56.75		19	33.92	33.40
	19	56.00		26	33.44	33.80
	26	54.25				
			July	2	32.33	33.30
July	2	54.50		10	32.49	32.62
	10	53.50		17	31.86	32.75
	17	51.75		24	30.75	32.70
	24	49.25		31	29.17	30.85
	31	48.50				
			August	7	28.69	29.30
August	7	50.00		15	29.64	28.70
	15	49.25		21	29.17	29.20
	21	48.00		28	28.38	28.20
	28	48.25				

Table 13. Continued

Los Angeles Week ending	Price	Utah Auction Market Week ending	Predicted price	Actual price
September 4	$48.50	September 4	$28.53	$34.25
11	47.75	11	28.69	34.25
18	46.25	18	28.22	28.00
25	46.00	25	27.27	28.00
October 2	45.50	2		
9	45.00	9	26.79	26.60
16	45.00	16	26.48	26.82
23	45.25	23	26.48	26.37
30	45.00	30	26.03	27.00
November 7	45.25	November 7	26.48	27.50
14	45.50	14	26.63	27.75
21	45.50	21	26.79	28.00
28	46.25	28	26.79	27.70
December 5	46.25	December 5	27.27	27.70
12	46.62	12	27.27	28.10
19	47.50	19	27.50	28.10
		31	28.06	29.00

X_3 = cost of transporting per 100 pounds of carcass beef from Utah to California

X_4 = value, in Utah, of the by-products per 100 pounds of carcass beef

X_5 = net margin of the classification and grade of slaughter cattle being predicted

Predicted price values for 1969 were calculated for the Utah choice steer auction market when compared with the Los Angeles dressed meat market (Table 14). A predicted price is first calculated without considering

Table 14. Predicted prices for Utah choice steer auction market using the market equalization model, 1969

Week ending	Y	X_2	X_3	X_4	A	X_{1a}	X_5	X_{1b}	X_{1c}
January									
2	$45.75	$3.28	$.75	$3.13	$.60	$26.91	$.44	$26.65	$26.50
9	45.75	3.28	.75	3.17	.60	26.93	.44	26.67	26.00
16	45.75	3.28	.75	3.21	.60	26.96	.44	26.70	26.80
23	46.25	3.28	.75	3.17	.60	27.23	.44	26.97	26.00
30	45.75	3.28	.75	3.10	.60	26.89	.44	26.63	26.50
February									
6	45.25	3.28	.75	3.09	.60	26.59	.44	26.32	27.00
13	45.50	3.28	.75	3.10	.60	26.74	.44	26.48	27.00
20	46.00	3.28	.75	3.21	.60	27.11	.44	26.85	27.00
27	46.75	3.28	.75	3.22	.60	27.56	.44	27.30	26.75
March									
6	47.00	3.28	.75	3.21	.60	27.11	.44	27.45	27.00
13	47.50	3.28	.75	3.27	.60	28.04	.44	27.76	27.00
20	48.00	3.28	.75	3.41	.60	28.43	.44	28.17	27.70
27	49.00	3.28	.75	3.45	.60	29.05	.44	28.79	27.00
April									
3	48.50	3.28	.75	3.68	.60	28.89	.44	28.63	27.50
10	49.50	3.28	.75	3.75	.60	29.13	.44	29.87	28.20
17	49.00	3.28	.75	3.65	.60	29.17	.44	28.91	28.40
24	50.25	3.28	.75	3.65	.60	29.92	.44	29.66	29.00
May									
1	51.25	3.28	.75	3.56	.60	30.47	.44	30.21	29.70
8	51.75	3.28	.75	3.66	.60	30.82	.44	30.54	30.20
15	53.75	3.28	.75	3.77	.60	32.09	.44	31.83	31.30
22	54.25	3.28	.75	3.80	.60	32.41	.44	32.15	33.30
28	54.75	3.28	.75	3.70	.60	32.65	.44	32.39	33.10
June									
5	55.50	3.28	.75	3.77	.60	33.14	.44	32.86	33.50
16	56.75	3.28	.75	3.73	.60	33.87	.44	33.61	33.40
19	56.00	3.28	.75	3.83	.60	33.48	.44	33.22	33.80
26	54.25	3.28	.75	3.85	.60	32.44	.44	32.20	33.80
July									
2	54.50	3.28	.75	3.88	.60	32.61	.44	32.35	33.30
10	53.50	3.28	.75	3.90	.60	32.02	.44	31.76	32.60
17	51.75	3.28	.75	3.91	.60	30.98	.44	30.72	32.75
24	49.25	3.28	.75	3.95	.60	29.50	.44	29.24	32.70
31	48.50	3.28	.75	3.93	.60	29.04	.44	28.78	30.85

Table 14. Continued

Week ending	Y	X_2	X_3	X_4	A	X_{1a}	X_5	X_{1b}	X_{1c}
August									
7	$50.00	$3.28	$.75	$4.01	$.60	$29.29	$.44	$29.73	$29.30
14	49.25	3.28	.75	4.07	.60	29.57	.44	29.31	38.70
21	48.00	3.28	.75	4.13	.60	28.86	.44	38.60	29.20
28	48.25	3.28	.75	4.13	.60	29.01	.44	28.75	28.20
September									
4	48.50	3.28	.75		.60	29.16	.44	28.90	34.25
11	47.75	3.28	.75		.60	28.75	.44	28.59	34.50
18	46.25	3.28	.75		.60	27.81	.44	27.55	28.00
25	46.00	3.28	.75		.60	27.67	.44	27.41	28.00
October									
2	45.50	3.28	.75		.60	27.30	.44	27.04	27.50
9	45.00	3.28	.75		.60	26.98	.44	26.72	26.60
16	45.00	3.28	.75		.60	26.97	.44	26.71	26.80
23	45.25	3.28	.75		.60	27.06	.44	26.50	26.37
30	45.00	3.28	.75		.60	26.97	.44	26.71	27.00
November									
6	45.25	3.28	.75		.60	27.12	.44	26.86	27.50
13	45.50	3.28	.75		.60	27.16	.44	26.90	27.75
20	45.50	3.28	.75		.60	27.20	.44	26.94	28.00
27	46.25	3.28	.75		.60	27.50	.44	27.33	27.70
December									
4	46.25	3.28	.75		.60	27.54	.44	27.33	27.70
11	46.62	3.28	.75		.60	27.85	.44	27.33	28.10
18	47.50	3.28	.75		.60	27.39	.44	27.59	28.10
30	47.50	3.28	.75		.60	28.30	.44	28.13	29.00

X_{1a} is the predicted price without including net margin

X_{1b} is the predicted price using net margins

X_{1c} is the actual price.

a net margin for meat packers. Packers net margin is then included in the mathematical model and a new predicted price is calculated.[8]

[8]The net margin for the meat packing industry for the past ten years has been $.44 per 100 pounds of carcass beef. When cattle producers and

The price predicted will be the midpoint of a range of prices for the week. This would tend to eliminate extreme price prediction and would make the predicted price more reliable.

Price prediction for all the classifications and grades of slaughter cattle can be made using the above procedure.

The average yearly price in the Utah choice steer slaughter cattle market was $29.11 per 100 pounds of live slaughter steer. The average yearly predicted price using the statistical model was $28.73. The average yearly predicted value using the equalization theory model was $28.74. These figures were rounded off to the nearest cent. The actual difference in price of the two models was two tenths of a cent per 100 pounds of slaughter steer. Either method is very reliable in calculating Utah choice steer slaughter prices.

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feeders are attempting to determine what cattle prices will be in Utah, the net margin for the meat packing industry or the net margin of a determined time period in the immediate past could be used. In the latter case, net margins similar to those in Table 8 would be used. The net margin, in 1969, for Utah meat packers slaughtering choice steers was $0.46 per 100 pounds of carcass beef. The net margin of $0.44 for the meat packing industry is used in predicting price values for Utah choice steers in 1969.

SUMMARY AND CONCLUSIONS

A knowledge of price correlations and an understanding of price adjustments which could be made in Utah slaughter cattle markets is important for cattle feeders, and producers so that they can market their cattle for the greatest returns. The purpose of this study was to determine how important the California dressed meat market is to the Utah slaughter cattle industry and make a price analysis of the Ogden-Los Angeles and the Odgen-San Francisco markets to determine the above information.

California is the largest out-of-state market for Utah dressed meat. In 1969, 32.3 percent of the Utah commercial cattle slaughter or 53 million pounds of carcass beef was exported to this sea-coast state. Los Angeles imported 72 percent and San Francisco 28 percent of the meat exported to California. Nevada is the only other major importer of Utah carcass beef. Only 0.6 percent of the commercial cattle slaughter in Utah is imported to Nevada.

Price comparisons of the various classifications and grades of Utah slaughter cattle were made with the corresponding classifications and grades of the Los Angeles and San Francisco dress meat markets to determine the correlation which exists between these market prices. Prices in the Utah slaughter market were compared to week advances in the California market to determine if a time lag existed in price changes in the two markets. In these comparisons, both Utah direct sales prices and auction sale prices were used.

It was found that the Utah choice steer and heifer auction market prices were highly correlated with the Los Angeles dressed meat market, having a one and a two week lag and R^2 of .893 and .837. The direct

sale markets were also highly correlated with no lag and one week lag and a R^2 of .936 and .911.

The good steer market (direct and auction) prices are very poorly correlated.

The Utah choice and good steer market prices and the San Francisco market prices are very highly correlated. There is a one week lag in the auction sale prices and the correlation indexes in these markets are .894 and .830. There was no lag in the direct sale markets, with a correlation index of .937 and .860.

A mathematical model was used to equate Utah slaughter cattle prices with California dressed meat market for cattle. The average yearly net margins were calculated, from this the average net return of the meat packing industry was subtracted. The residual was adjusted to live cattle prices to determine what changes could be made in Utah slaughter prices.

The net margins of the San Francisco market are higher than the net margins of the Los Angeles market. Choice steer meat exported to San Francisco would return $0.25 per hundred weight more than the same meat exported to the Los Angeles market. The good steer market would return $1.70 more.

Prices in Utah for choice and good steer and choice heifers could be increased by $0.01, $0.34 and $0.43 per hundred pounds of live slaughter cattle, in 1969, and still allow meat packers the average return for the industry. These figures were the result of comparing Utah slaughter market prices and the Los Angeles dressed meat market prices. Direct sale prices in the Utah slaughter market, in 1969, could have been changed by- $0.52, $0.23 and- $0.28.

If Utah auction prices for choice and good steers are compared with the San Francisco choice and good steer dressed meat market prices, Utah

prices could be increased by $0.23 and $1.54 in 1969. The direct sale prices for the same markets could be changed by-$0.41 and $1.35.

The information gained in this study, if used, would show producers of slaughter cattle how to calculate predicted cattle prices. Also this information would give an understanding of what price conditions will be at the auction market in a particular day, thus allowing producers to market their slaughter cattle for the highest return.

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APPENDIXES

Appendix A

By-products values

Appendix table 1. Hide and offal value estimates, 1967-1968

WEEK ENDING 1967

January		May		September	
7	$2.13	6	$1.99	2	$1.82
14	2.13	13	1.90	9	1.87
21	2.11	20	1.95	16	1.90
28	2.06	27	1.95	23	1.93
				30	1.85
February		**June**		**October**	
4	2.10	3	2.01	7	1.85
11	2.07	10	2.04	14	1.82
18	1.98	17	1.92	21	1.76
25	2.01	24	1.85	28	1.80
March		**July**		**November**	
4	1.96	1	1.81	4	1.77
11	1.99	8	1.90	11	1.67
18	1.96	15	1.89	18	1.74
25	1.94	22	1.90	25	1.77
31	1.93	29	1.80		
April		**August**		**December**	
8	1.88	5	1.80	2	1.80
15	1.89	12	1.88	9	1.75
22	1.96	19	1.78	16	1.72
29	1.98	26	1.80	23	1.72
				30	1.71

WEEK ENDING 1968

January		May		September	
6	$1.67	11	$1.86		$1.86
13	1.68	18	1.83		1.87
20	1.69	25	1.83		1.89
27	1.68	31	1.86		1.93

Appendix table 1. Continued

WEEK ENDING 1968

February		June		October	
3	$1.65	8	$1.83		$1.90
10	1.68	15	1.77		1.90
17	1.67	22	1.79		1.92
24	1.71	29	1.76		1.90
March		**July**		**November**	
2	1.74	6	1.77	2	1.91
9	1.76	13	1.78	9	1.93
16	1.82	20	1.79	16	1.96
23	1.80	26	1.79	23	1.89
30	1.77			30	1.90
April		**August**		**December**	
6	1.79	3	1.77	7	1.92
13	1.75	10	1.78	14	1.87
20	1.76	17	1.80	21	1.83
27	1.81	24	1.83	28	1.84
		31	1.85		

WEEK ENDING 1969

January		May		September	
4	$1.88	3	$3.14	6	$2.48
11	1.90	10	2.20	13	2.53
18	1.92	17	2.26	20	2.48
25	1.90	24	2.28	27	2.49
		31	2.22		
February		**June**		**October**	
1	1.86	7	2.26	4	2.42
8	1.85	14	2.24	11	2.40
15	1.86	21	2.30	18	2.39
22	1.92	28	2.31	25	2.33
March		**July**		**November**	
1	1.93	5	2.33	1	2.35
8	1.92	13	2.34	8	2.39
15	1.97	19	2.35	15	2.28
22	2.05	26	2.37	22	2.32
29	2.07			29	2.26

Appendix table 1. Continued

WEEK ENDING 1969					
April		August		December	
5	$2.21	2	$2.36	6	$2.26
12	2.25	9	2.43	13	2.29
19	2.19	16	2.44	20	2.31
26	2.19	23	2.48	27	2.23
		30	2.48		

Source: Consumer and Marketing Service, Livestock Division, United States Department of Agriculture.

Note: "The Hide and Offal Value Estimates" is calculated by multiplying the list of by-product yields by the average price in the by-products as reported in the Midwest West section of the weekly offal report.

Appendix B

Time Series Price Quotations

The time period for the San Francisco and Los Angeles weekly price quotations of the dressed meat market began Friday morning and ended Thursday evening of each week. Utah direct sale market prices are weekly price quotations ending Friday of each week. Ogden auction sale market prices are weekly price quotations ending Friday of each week during 1969 and ending Monday during 1967 and 1968. Because there is only a Monday auction at the Ogden Stockyards, the price quotations for Monday were assumed to be representative for the week.

Appendix table 2. Time series price quotations for Los Angeles and San Francisco per 100 pounds dressed meat, 1967-1969.

WEEK ENDING	LOS ANGELES			SAN FRANCISCO	
	Choice Steer	Good Steer	Choice Heifer	Choice Steer	Good Steer
Jan. 5, 1967	$41.00	$38.25	$38.25	$41.75	$39.50
12	42.00	38.75	39.25	42.75	40.50
19	41.50	38.75	29.25	42.67	40.75
26	40.50	38.50	38.75	41.75	40.00
Feb. 2	40.50	38.50	38.25	40.75	38.75
9	40.25	38.75	37.75	40.25	38.75
16	40.50	38.00	38.00	40.25	39.00
23	40.00	37.50	37.87	39.75	38.50
Mar. 2	39.75	37.75	37.50	39.75	38.50
9	40.00	37.25	38.00	40.75	39.50
16	39.75	37.25	37.37	40.50	39.50
23	40.00	37.25	37.50	40.75	39.50
30	40.75	37.50	37.37	40.75	39.25
Apr. 8	41.75	37.50	38.75	40.75	39.50
15	41.75	38.75	38.75	41.75	40.50
22	41.25	38.00	38.00	41.50	40.00
27	41.00	38.50	38.00	41.37	40.00

Appendix table 2. Continued

WEEK ENDING	LOS ANGELES			SAN FRANCISCO	
	Choice Steer	Good Steer	Choice Heifer	Choice Steer	Good Steer
May 4	$41.00	$37.50	$38.37	$41.25	$39.75
11	41.00	38.50	39.50	42.25	40.75
18	42.50	39.50	40.25	42.75	41.25
25	42.25	39.25	40.00	43.00	41.50
June 1	43.75	40.50	41.37	44.50	43.50
8	44.50	41.25	41.75	44.75	43.50
15	44.00	41.25	41.75	44.50	44.00
22	44.00	41.25	41.25	44.37	43.50
29	43.75	41.00	41.50	44.00	43.00
July 6	45.00	41.75	42.25	44.75	44.00
13	44.75	42.00	42.25	44.50	44.00
20	44.25	42.00	42.25	44.75	44.25
27	43.50	41.50	41.67	44.25	44.25
Aug. 3	43.75	40.75	42.00	44.25	44.25
10	44.75	42.00	42.25	44.75	44.25
17	44.75	42.00	42.25	44.87	44.25
24	44.00	42.00	42.25	44.25	44.00
31	44.75	42.25	43.00	45.25	44.25
Sept. 7	45.00	41.75	43.25	45.25	44.25
14	45.25	41.75	42.75	45.25	43.75
21	44.75	41.25	42.75	44.75	43.25
28	44.25	41.25	42.00	44.25	42.75
Oct. 5	43.50	40.75	41.00	43.75	42.50
12	43.37	40.50	41.00	43.50	42.00
19	43.00	40.00	40.50	42.35	41.75
26	43.00	39.00	40.50	42.87	41.25
Nov. 2	43.50	39.00	40.00	42.37	40.75
8	42.75	38.75	40.25	42.37	40.75
16	43.00	39.00	40.00	42.12	40.75
22	43.00	39.00	40.25	42.75	41.12
30	43.75	40.37	40.25	42.75	41.50
Dec. 7	43.50	39.25	41.25	43.50	42.00
14	44.50	40.50	41.25	43.75	42.25
21	43.75	40.00	41.00	43.75	42.25
28	44.00	41.00	42.75	44.12	42.75
Jan 4, 1968	44.00	41.00	41.50	44.12	53.25
11	43.75	39.50	41.50	43.87	42.50
18	44.00	40.25	41.75	44.00	42.50
25	43.75	40.00	41.75	43.87	42.25
Feb. 1	44.00	40.00	41.00	43.37	43.00
8	44.75	41.00	41.75	43.75	43.00
15	45.25	41.75	42.75	44.87	43.50
21	45.00	41.75	42.25	43.50	43.50
29	44.75	41.25	42.50	44.75	43.50

Appendix table 2. Continued

WEEK ENDING	LOS ANGELES			SAN FRANCISCO	
	Choice Steer	Good Steer	Choice Heifer	Choice Steer	Good Steer
Mar. 7	$44.75	$40.85	$42.75	$45.25	$43.75
14	44.87	44.00	42.75	45.25	43.75
21	44.50	41.75	42.25	45.25	43.75
28	44.75	42.50	42.25	44.25	43.75
Apr. 4	44.25	42.50	42.00	44.75	43.50
11	44.50	42.50	42.75	44.75	44.00
18	44.25	41.00	42.00	44.12	43.50
25	43.87	41.00	42.25	45.25	43.50
May 2	44.75	41.75	42.50	45.75	43.75
9	44.75	41.75	42.50	45.75	43.75
16	44.75	42.25	42.50	45.75	43.75
23	44.50	41.75	42.25	45.37	43.50
31	45.00	41.75	53.25	45.87	44.00
June 6	45.00	44.25	42.75	45.75	44.00
13	45.25	42.50	43.25	45.75	44.50
20	45.75	43.25	43.67	46.12	44.75
28	45.25	43.25	43.25	46.00	44.50
July 3	46.25	44.25	44.67	46.75	45.50
11	46.00	44.25	44.65	46.75	45.50
18	46.00	44.00	44.00	46.75	45.50
25	45.50	43.50	48.50	46.50	45.00
Aug. 1	45.75	43.25	47.25	47.00	44.50
8	45.50	43.00	48.00	46.75	45.25
15	48.75	42.75	48.00	46.00	44.50
22	45.75	43.75	47.00	45.75	44.50
29	45.75	43.75	47.00	45.75	44.25
Sept. 5	45.50	41.75	45.50	45.75	44.00
12	45.25	41.75	44.75	45.25	43.50
19	44.75	41.75	44.50	45.25	43.50
26	44.67	41.75	44.50	44.75	42.75
Oct. 3	44.00	40.75	43.25	44.50	42.50
10	43.50	40.50	42.75	44.00	42.00
17	43.50	40.50	43.75	44.00	42.00
24	43.75	40.75	44.75	44.00	42.25
31	43.75	40.75	44.25	44.50	42.25
Nov. 1	44.25	40.75	44.00	44.00	42.25
14	44.75	41.25	44.12	44.50	42.75
21	44.75	44.75	44.75	44.75	43.00
27	45.25	44.75	44.00	45.25	43.50
Dec. 5	45.25	44.50	44.00	45.25	44.00
12	45.25	45.00	43.25	45.75	44.25
19	45.50	42.00	43.50	45.75	44.25
26	45.50	44.25	43.25	46.25	44.25

Appendix table 2. Continued

WEEK ENDING	LOS ANGELES			SAN FRANCISCO	
	Choice Steer	Good Steer	Choice Heifer	Choice Steer	Good Steer
Jan. 2, 1969	$45.75	$41.75	$43.00	$46.25	$44.50
9	45.75	42.50	42.00	46.25	44.50
16	45.75	43.00	41.75	46.25	44.50
23	46.25	43.00	41.50	46.25	44.50
30	45.75	43.00	41.75	46.25	44.50
Feb. 6	45.25	43.67	42.00	46.00	44.50
13	45.50	43.00	42.00	45.50	44.50
20	46.00	43.00	42.25	46.25	44.50
27	46.75	43.75	43.50	46.75	45.75
Mar. 6	47.00	45.25	43.50	47.00	46.00
13	47.50	44.50	43.25	47.50	47.00
20	48.00	44.50	43.50	49.00	47.00
27	49.00	46.00	43.75	49.00	48.50
Apr. 3	48.50	45.25	44.25	46.75	48.50
10	49.50	46.00	44.25	49.75	49.50
17	49.00	46.00	44.25	49.00	49.50
24	50.25	46.50	44.00	50.00	50.50
May 1	51.25	48.00	49.75	51.25	50.50
8	51.75	50.25	49.50	52.00	51.75
15	53.75	50.50	52.50	54.75	54.50
22	54.25	41.50	52.75	55.50	54.50
28	54.75	52.75	53.75	56.25	55.50
June 5	55.50	52.00	53.25	56.75	56.00
12	56.75	52.50	53.75	56.75	56.00
19	56.00	52.25	53.25	55.75	55.50
26	54.25	51.50	53.25	54.87	54.50
July 2	54.50	51.75	53.00	55.37	54.50
10	53.50	50.50	50.75	54.25	53.50
17	51.75	52.50	50.00	53.00	52.50
24	49.25	47.25	46.75	50.37	50.25
31	48.50	47.25	46.75	49.75	49.50
Aug. 7	50.00	47.00	48.00	50.50	50.50
14	49.25	46.00	46.78	49.75	48.50
21	48.00	45.75	45.38	48.50	47.50
28	48.25	46.25	46.00	48.50	47.50
Sept. 4	48.50	45.25	46.25	48.25	47.75
11	47.75	45.00	45.25	47.81	46.50
18	46.25	43.75	45.25	46.12	45.50
25	46.00	43.50	43.50	46.75	45.50
Oct. 2	45.50	42.50	42.25	45.00	43.50
9	45.00	42.50	42.50	45.00	43.50
16	45.00	42.00	42.25	45.25	42.00
23	45.25	41.50	42.25	45.00	42.00
30	45.00	42.00	42.75	45.25	42.00

Appendix table 2. Continued

WEEK ENDING	LOS ANGELES			SAN FRANCISCO	
	Choice Steer	Good Steer	Choice Heifer	Choice Steer	Good Steer
Nov. 6	$45.25	$41.50	$42.75	$45.25	$42.00
13	45.50	42.00	42.50	45.75	43.25
20	45.50	42.00	42.00	45.00	42.75
27	46.25	42.75	43.25	46.26	43.75
Dec. 4	46.25	42.75	43.00	46.50	43.75
11	46.62	43.25	44.25	47.25	45.25
18	47.50	45.00	43.50	47.00	44.25
31	47.50	43.50	44.00	47.75	44.00

Appendix table 3. Time series price quotations for Utah per 100 pounds of slaughter cattle, 1967-1969

WEEK ENDING	DIRECT			AUCTION		
	Choice Steer	Good Steer	Choice Heifer	Choice Steer	Good Steer	Choice Heifer
Jan. 5, 1967	$24.75	$22.57	$23.75	$23.95	$22.30	$23.50
12	24.75	22.75	23.50	24.20	22.25	22.50
19	24.75	22.75	23.50	24.20	22.00	24.30
26	27.75	72.50	23.50	24.30	22.20	24.00
Feb. 2	24.00	22.50	24.25	24.60	22.20	24.05
9	23.75	22.00	22.75	24.00	22.50	23.12
16	23.75	22.00	22.62	23.60	22.80	23.00
23	23.75	22.00	22.62	22.60	21.80	23.00
Mar. 2	23.50	21.67	22.62	22.90	21.80	23.00
9	24.00	22.25	22.75	23.00	22.00	23.15
16	24.50	22.00	22.75	23.00	22.00	22.95
23	24.75	22.25	23.25	23.50	22.60	22.50
30	24.75	22.25	23.25	23.45	21.50	22.00
Apr. 8	24.75	22.25	23.25	23.20	21.50	22.00
15	24.50	22.00	23.25	23.30	21.00	21.80
22	24.75	22.25	23.37	23.00	22.30	22.85
27	25.00	22.25	23.25	24.30	22.30	23.25
May 4	24.75	22.25	23.67	23.60	23.30	23.00
11	25.50	22.50	23.75	22.90	23.30	23.00
18	26.00	23.00	24.00	24.30	22.60	23.00
25	26.00	23.25	24.25	24.50	22.30	23.20
June 1	26.50	23.50	24.50	24.65	23.50	23.20
8	26.75	24.00	25.00	26.10	23.25	23.95
15	26.75	24.12	25.25	25.70	23.45	24.25
22	26.75	24.25	24.87	26.30	24.12	24.20
29	26.75	24.25	25.75	26.10	24.20	24.80
July 6	26.75	24.25	25.50	26.70	24.00	24.50
13	26.75	24.25	25.75	26.50	24.25	25.50
20	26.75	24.37	25.75	26.30	24.50	26.00
27	26.75	24.50	25.75	26.40	24.25	25.00
Aug. 3	26.37	24.00	25.67	26.30	24.10	24.50
10	26.25	24.12	25.25	25.60	23.87	26.00
17	26.25	25.00	24.75	26.50	24.25	27.75
24	26.25	25.00	25.12	26.20	24.30	24.60
31	26.67	24.37	25.62	26.40	24.25	25.90
Sept. 7	26.75	24.37	25.62	26.00	24.25	25.00
14	26.67	24.00	25.50	26.00	24.75	25.00
21	26.25	24.00	25.25	25.70	24.15	24.80
28	25.75	24.25	24.75	25.25	23.85	25.00

Appendix table 3. Continued

WEEK ENDING	DIRECT			AUCTION		
	Choice Steer	Good Steer	Choice Heifer	Choice Steer	Good Steer	Choice Heifer
Oct. 5	$25.50	$23.50	$24.75	$25.10	$23.25	$25.35
12	25.25	23.75	24.25	24.00	22.00	24.50
19	25.25	22.50	24.12	24.00	22.90	24.00
26	24.87	23.00	23.87	24.50	22.20	24.00
Nov. 2	24.75	23.25	24.00	24.25	23.05	24.05
8	24.50	23.25	24.00	24.00	23.00	23.80
16	24.25	23.25	23.75	23.90	22.85	23.80
22	25.00	22.12	24.00	24.25	22.87	24.00
30	25.25	21.75	24.00	24.50	23.20	24.00
Dec. 5	25.25	23.50	24.87	24.50	23.05	23.80
14	24.75	23.75	25.12	24.90	23.00	23.80
21	25.25	24.00	25.12	24.50	21.50	24.25
28	25.37	24.00	25.25	24.90	22.50	24.00
Jan. 4, 1968	24.69	23.75	25.00	25.60	22.50	25.50
11	25.50	23.75	25.00	25.50	24.00	25.20
18	25.75	24.00	25.25	24.50	22.05	25.20
25	25.67	23.75	25.25	25.50	22.20	25.20
Feb. 1	25.67	23.75	25.25	25.70	24.10	25.20
8	25.37	24.00	25.25	25.00	23.60	24.75
15	25.27	23.75	25.25	25.00	23.60	24.80
21	25.27	23.75	25.37	25.70	23.50	24.75
29	26.25	23.75	25.37	24.95	23.37	24.75
Mar. 7	26.50	24.00	25.37	25.80	23.37	25.70
14	26.50	24.12	25.62	25.50	24.75	25.25
21	26.50	24.12	25.72	27.70	25.20	25.25
28	26.37	24.25	25.87	26.00	23.80	25.00
Apr. 4	26.25	24.50	26.00	25.80	24.45	24.75
11	26.25	24.37	26.00	26.20	23.50	24.50
18	26.50	24.75	26.12	26.50	23.50	24.00
25	26.50	24.67	26.25	25.80	23.35	25.00
May 2	26.50	24.67	26.25	26.35	24.30	25.00
9	26.25	24.67	26.00	26.80	24.55	24.70
16	26.50	24.25	25.75	26.20	24.30	24.60
23	26.67	24.25	25.75	26.50	24.67	25.10
31	26.75	24.00	25.75	26.30	24.20	25.00
June 6	26.75	23.87	25.62	27.00	24.25	24.80
13	27.00	23.87	25.50	26.60	24.50	24.70
20	27.25	23.75	25.62	27.00	24.75	25.75
27	27.50	23.25	26.75	26.60	25.05	25.50
July 3	27.75	23.37	25.37	26.60	24.90	25.30
11	27.87	23.67	25.25	27.30	25.25	25.45
18	27.75	23.25	25.25	27.30	26.60	25.45
25	27.50	23.25	25.25	26.70	25.25	25.70

Appendix table 3. Continued

WEEK ENDING	DIRECT			AUCTION		
	Choice Steer	Good Steer	Choice Heifer	Choice Steer	Good Steer	Choice Heifer
Aug. 1	$27.25	$23.00	$25.25	$26.60	$25.00	$25.60
8	27.25	23.25	25.25	26.00	25.10	25.00
15	27.00	23.50	25.25	26.25	23.75	25.40
22	26.75	23.37	25.25	26.25	23.20	25.40
29	26.75	23.37	25.25	26.00	24.05	26.10
Sept. 5	26.75	23.87	25.37	25.10	24.70	25.25
12	26.75	23.87	25.67	26.00	24.60	25.70
19	26.75	24.00	25.67	26.00	24.65	25.25
26	26.75	24.00	26.12	26.50	23.45	25.50
Oct. 3	26.50	24.00	26.00	26.50	24.40	25.60
10	26.25	24.00	26.12	25.90	23.67	24.25
17	26.25	24.00	25.87	25.50	23.67	24.00
24	26.12	24.12	25.75	24.40	23.35	24.50
31	26.25	23.87	25.75	24.10	22.75	24.00
Nov. 7	26.25	23.50	25.25	25.50	22.75	23.90
14	26.25	23.37	25.25	25.00	22.75	24.50
21	26.50	23.37	25.25	25.20	23.15	25.10
27	27.25	23.87	25.37	26.40	23.15	25.30
Dec. 5	27.00	23.87	25.67	25.00	23.15	25.00
12	27.12	24.00	25.67	27.10	24.37	25.70
19	27.12	24.00	26.12	27.10	24.70	25.70
26	27.25	24.00	26.00	27.00	24.70	24.90
Jan. 2, 1969	27.25	24.00	26.12	26.50	23.00	25.30
9	27.25	24.00	25.87	26.00	23.60	25.50
16	27.25	24.12	25.75	26.80	24.75	25.30
23	27.25	23.87	25.75	26.00	21.70	25.20
30	27.25	24.00	25.75	26.50	23.90	25.60
Feb. 6	27.50	24.12	25.87	27.00	23.90	25.80
13	27.67	26.25	25.87	27.00	23.75	25.80
20	27.67	24.87	26.00	27.00	24.10	25.80
27	28.00	24.87	26.25	26.75	25.50	25.80
Mar. 6	28.50	25.25	26.50	27.00	23.40	26.70
13	28.75	25.25	26.67	27.00	24.30	26.50
20	29.50	25.75	27.50	27.70	25.75	26.90
27	30.25	26.75	27.50	27.00	25.00	27.00
Apr. 3	30.25	26.25	28.00	27.50	25.75	27.00
10	30.50	26.25	28.25	28.20	24.25	25.50
17	30.50	26.75	28.25	28.40	25.50	25.50
24	29.75	27.25	28.50	29.00	26.10	26.80
May 1	30.75	29.00	28.50	29.70	25.35	27.50
8	31.50	28.87	29.00	30.20	28.25	27.75
15	33.00	29.25	30.25	31.30	29.25	30.00
22	33.50	30.00	31.25	33.10	29.50	29.20
28	34.50	30.25	32.00	33.50	29.50	30.30

Appendix table 3. Continued

WEEK ENDING	DIRECT			AUCTION		
	Choice Steer	Good Steer	Choice Heifer	Choice Steer	Good Steer	Choice Heifer
June 5	$34.75	$30.25	$32.75	$33.40	$30.00	$29.80
12	35.25	30.00	34.25	33.80	30.00	31.40
19	35.00	29.75	32.50	33.80	30.00	31.75
26	34.00	29.50	32.75	32.30	30.35	31.50
July 2	34.00	29.25	31.50	32.60	29.55	30.50
10	32.75	28.75	31.75	32.75	30.25	30.90
17	31.50	28.50	30.50	32.70	29.20	29.85
24	30.00	27.75	29.50	30.85	26.85	30.00
31	29.37	26.50	28.50	29.30	28.30	28.00
Aug. 7	29.75	26.25	28.40	28.70	26.50	29.00
14	29.30	26.25	27.75	29.20	25.40	29.10
21	29.00	26.00	27.50	29.20	26.75	26.85
28	28.50	25.25	27.00	28.20	25.75	25.35
Sept. 4	28.37	25.00	26.62	31.00	25.00	27.20
11	28.25	24.25	31.25	30.00	25.00	27.00
18	27.87	24.50	36.12	28.00	25.00	27.10
25	27.50	24.25	26.12	28.00	24.30	26.50
Oct. 2	27.25	24.25	25.50	27.50	23.00	26.75
9	27.00	24.25	24.50	26.60	24.00	26.00
16	26.75	24.12	25.75	26.80	25.00	26.00
23	26.50	24.00	25.87	26.37	25.00	26.00
30	26.87	24.00	25.87	27.00	25.50	25.75
Nov. 6	26.87	24.25	26.25	22.50	24.60	25.50
13	27.50	24.25	26.37	27.75	25.00	25.40
20	27.25	24.50	26.50	28.00	25.35	25.00
27	28.00	24.50	26.50	27.70	23.50	27.00
Dec. 4	28.25	25.25	27.25	27.70	25.00	27.00
11	29.00	25.37	27.75	28.10	25.00	27.00
18	28.37	25.25	27.75	28.50	24.50	27.70
31	28.50	25.50	27.75	29.00	25.00	26.90

VITA

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Master of Science

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