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AN EVALUATION OF RETAIL YIELD
INFLUENCE ON BEEF PRICING AND
TRANSPORATION COSTS OF
DRESSED BEEF

ALVIN R. SCHUPP, WILLIAM C. STRINGER AND CHARLES L. CRAMER



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SUMMARY

This study was conducted to evaluate pricing accuracy, in terms of estimated retail yield, at the packing plant level. Previous research had indicated that live animal and carcass beef values were influenced greatly by their percentage retail yield. However, little empirical evidence has been published concerning the actual packer price-live animal retail yield and wholesale price-carcass retail yield relationships existing in today's marketing system. Data were also lacking as to the extent of packer and retailer utilization of retail yield as a pricing criterion in their buying of live cattle and carcasses.

Data from three Missouri packing plants were obtained in 1964 and 1965, consisting of 65 lots totaling 1506 carcasses. Retail yield percentages were estimated by observation of the carcasses by a member of the Animal Husbandry staff of the University.

Analysis on a packer lot basis of data collected for this study indicated that price tended to vary directly with grade and that retail yield varied inversely with grade. However, these relationships are for the average of all lot average prices and retail yields not necessarily for individual lot averages (Tables I, II and III). Variation within the particular lots studied may have resulted in this relationship for averages. If the packers had bought exclusively on the basis of estimated retail yield they would have almost reversed their buying and paid most where they actually paid least and vice versa. Correlation coefficients between estimated retail yield and price paid by packer, when grade was uncontrolled, were $-.56$, $-.89$ and $-.73$ respectively, for the three plants.

When "spreads" (the difference in price paid by the packer per cwt. live weight and retail value of the cuts obtainable per cwt. live weight) were plotted against estimated retail yield a positive relationship resulted. This indicates the packer realizes a greater return from the higher yielding animals *if* he sells the higher yielding carcasses at a higher price. It also indicates that the live animal price is too low in relation to retail value, (especially for the higher yielding animals).

Analysis of wholesale prices indicated no relationship between estimated retail yield and wholesale prices. This absence suggests that there is little effort on the part of retailers to buy on the basis of estimated retail yield.

Substantial differences existed between purchasers in the average retail yield of their purchases. Some purchasers consistently received high yielding carcasses while others received low yielding carcasses. Prices paid did not necessarily coincide with these averages as high prices were compatible with both low and high retail yield averages and vice versa. Statistical analysis of the mean retail yields among purchasers indicated there were significant differences in mean retail yields among purchasers (with grade and weight controlled).

An attempt was made to measure the extent to which the purchasers were buying on the basis of estimated retail yield. This was done by measuring the differences (deviations) between individual purchaser "spreads" and the "mean spread" of all purchasers of a particular grade and plant. Under the assumption that this mean spread indicates pricing accuracy for all factors other than retail yield, the sign and magnitude of the deviations indicate those purchasers paying too much and those too little for the retail yield they received. The average purchaser with a positive deviation had a \$1.08 (Plant A) per cwt. carcass wider calculated retail spread than the average purchaser with a negative deviation. The same measurement for Plant B was \$2.07 and \$3.27 for Plant C.

Graphically this spread-estimated retail yield relationship is positive, meaning retailer returns increase as retail yield increases. The packer can share this benefit from increasing retail yield percentage if he receives a premium for higher yielding carcasses from the retailer. The producer may also share in these benefits by receiving a higher price for cattle with higher retail yield.

The transportation study offered evidence of substantial savings to the retailer by buying higher yielding cattle whose shipping cost per pound retail yield is lower. Additional savings in shipping costs are also possible for the retail buyer if he requests the packer trim excess fat prior to shipment. Should the packer reimburse the buyer for the value of the trimmed fat, which is a valuable edible by-product at the packer level, even more savings from this policy would accrue to the retail buyer.

Implications

The data in the study revealed a lack of general realization by the marketing system of the potential of estimated retail yield as a measure of carcass value. Certain of the retail purchasers seemed, from their purchases, to be aware of retail yield variation and were capitalizing on it through use of company employed buyers. Margins or spreads were greater from the high yielding cattle indicating a potential inequality in pricing. If pricing differentials for retail yield variation are to exist it will require large numbers of retailers and packers actively bidding for carcasses and live animals on the basis of their estimated retail yield. Such a system of differentials for retail yield are possible provided the trade elements realize its value and make the appropriate adjustments.

The consumer has expressed her preference for the leaner more tender cuts of beef. Rhodes¹ indicated the marketing system will realize the importance of retail yield as a value determinant when they fully recognize the nearly homogeneous acceptance of high Good and Choice grade beef by consumers and when they understand its implications and uses. These conditions have not been met by the marketing system.

When the retailer pays more for the higher yielding carcasses (because of their greater retail value) than for the low yielding carcasses the profit incentive encourages the packer to select and buy the higher yielding beef animals. Competitive bidding will raise the price of the live animals due to the increased demand for higher yielding animals. In this way the marketing system can naturally develop its own price differentials for retail yield variation without force or coercion from outside. True pricing accuracy requires recognition and utilization of all factors known to affect value and not only those which the system is presently using.

If the retailer uses retail yield as a pricing criterion, the packer will realize a reduction in his margin unless he, too, begins to buy and sell with retail yield as a value standard. This will logically result in price differentials for retail yield in live animals, rewarding those producing high yielding animals and discriminating in price against those producing fat wasty animals. Packer buyers can be trained to estimate retail yield in live animals and to adjust their bid prices accordingly. Since a packer buys animals on a lot basis, but sells carcasses individually, the packer buyer must carefully and accurately estimate the lot retail yield average.

Beef production can be changed to meet retail yield standards much as it has been for grade standards. Extra compensation is by far the most effective "educator" for the producer. The potential of retail yield as a value determinant should eventually give it equal, or greater, weight with grade and dressing percentage as value criteria in live and carcass beef. The ideal described for beef pricing is far from reality yet definitely not beyond reach in a free enterprise system.

This study suggested several areas which invite further research:

- 1. Determining the economies of packer trimming, cutting and packaging beef as opposed to same functions being performed by the retailer.
- 2. Determining the extent of packer and retailer use of retail yield in forming their bid prices.
- 3. Improvement in present breeds of cattle to provide both high cutability and desirable grade characteristics while maintaining or increasing present growth and feed efficiencies.

¹V. James Rhodes, "Acceptance and Yield of Choice and Good Beef: Research Results and Implications," *J. Farm Economics*, May, 1961, p. 187.

INTRODUCTION

The consumer's quality standard for judging retail cuts of beef has changed. The present generation is more calorie and nutrition minded and has changed its eating habits accordingly.² The satisfaction formerly gained from a highly finished retail cut of beef is no longer in evidence as today's housewife shows definite signs of discrimination against retail cuts having large amounts of subcutaneous fat. This discrimination has increased the popularity of trimming beef both before and after it is separated into retail cuts. Marketing research has developed new tenderizing methods, more attractive packages and new means of preserving fresh beef without refrigeration. However, these "remedies" do not treat the major problem of excessive, unattractive fat, much less correct it.

In the past, producers have been educated to produce beef animals to meet certain U.S. Grade standards. According to Kidwell (1959), fatness was the principal determinant of grade.³ To meet these standards and command the highest prices, producers were encouraged to breed and feed animals which would produce the desired conformation and degree of finish. Since degree of finish is highly related to dressing percentage,⁴ packers realize a larger percentage of salable product from the highly finished animal. However, the retailer is concerned with the consumer's acceptance of the beef and the percentage of retail cuts he can realize from the side or quarter he purchases. This conflict of basic interests between packer and retailer has encouraged research toward discovering new standards of judging beef quality and toward more equitable pricing criteria utilizing retail yield percentage.

Previous Work in this Area

Several studies of consumer preferences have been made by Missouri Experiment Station personnel and by others. Missouri researchers discovered a general similarity in consumer preference of Good and Choice beef⁵ but indicated that more consumers expressed dissatisfaction with the lower grade cuts than with the higher grade cuts.⁶ Washington State researchers found in a test of salability of chuck roasts, with and without price differentials, that consumers were conscious of the amount of fat and were willing to pay from 4¢ to 8½¢ per pound more

¹D. E. Brady, "Results of Consumer Preference Studies," *J. Animal Science*, 16:233, 1957.

²J. F. Kidwell and others, "Relation of Production Factors to Conformation Scores and Body Measurement, Associations Among Production Factors and the Relation of Carcass Grade and Fatness to Consumer Preferences in Yearling Steers," *J. Animal Science*, 18:906, 1959.

³Branaman, O. G. Hankins, and L. M. Alexander, "The Relation of Degree of Finish in Cattle to Production and Meat Factors," *Proc. Am. Soc. Animal Prod.*, pp. 295-300, 1956; M. A. Alexander, "A Study of Beef Carcass Composition and Quality," M. S. thesis, University of Missouri, 1961, p. 76.

⁴Rhodes, pp. 181-186.

⁵V. James Rhodes and others, "A New Approach to Measuring Consumer Acceptability of Beef," *Research Bulletin* 677, Mo. Agri. Exper. Station, September, 1958, pp. 10-11.

for the leaner grades and cuts.⁷ Research workers in Arizona, California, Colorado, and Texas found a regional preference for Good grade beef as compared with Choice grade with or without price differentials.⁸ Prime grade was the least desired of all grades tested.

Tenderness and flavor are said to be associated with quality by the consumer.⁹ Many means, both mechanical and subjective, have been devised to test tenderness of beef. Studies have indicated that tenderness increases with U.S. Grade.¹⁰ However, several other reports have revealed that fat does not necessarily increase tenderness, especially if it is not intramuscular fat.¹¹

As mentioned previously, the retailer wants a carcass that yields as much in retail cuts of a certain grade as possible. Studies by USDA revealed that there is a wide variation in retail yield among carcasses of each grade.¹² Losses in carcass weight, when separated into salable retail cuts, are the results of fat trim, loss of bone, and cutting losses. It is commonly known that retail yield is negatively correlated with dressing percentage and the degree of finish. Conformation score of carcass was found to not be indicative of retail yield.¹³ In fact variation in retail yield is primarily due to variation in finish. Finish, within a grade, was 4.5 times as important as conformation indicating retail yield of closely trimmed major retail cuts. Other tests have indicated that retail yield is lower among heifers than steers¹⁴ and is a function of nutrition.¹⁵

The Problem

Value differences have been associated with variation in carcass retail yield percentages by several.¹⁶ Their data reveal some significant carcass value variation

⁷Van Syckle, Calla and T. S. Russell, "Consumer Choice of Chuck Roasts of Varying Qualities with and without Price Differentials," Washington State College, 1958 (as cited by G. T. King in Proc. Twelfth Recip. Meat Conference, p. 16, 1959).

⁸E. Birmingham, "Projects and Results of Consumer Preference for Meat and Meat Products," *Proc. Tenth Ann. Recip. Meat Conference*, pp. 87-88, 1957.

⁹W. E. Meyer, "A Study of Meatiness and Quality of Beef Cattle," M.S. Thesis, University of Missouri, 1961, p. 1.

¹⁰E. Wierbicki and others, "Effect of Castration on Biochemistry and Quality of Beef," *J. Agri. Food Chem.*, 3:248-249, 1955, R. M. Griswold, "The Effect of Different Methods of Cooking Beef Round of Commercial and Prime Grades, I. Palatability and Shear Value," *Food Res.*, 26:160-170, 1955.

¹¹Cover and others, "The Relationship of Fatness in Yearling Steers to Juiciness and Tenderness of Broiled and Braised Steaks," *J. F. Animal Science*, 15:464-72, 1956; Branaman, Loc. cit., p. 296.

¹²J. C. Pierce, "Quality and Retail Cutability," *Proc. Twelfth Ann. Recip. Meat Conference*, pp. 41-42, 1959.

¹³J. C. Miller, "Comparison of Longissimus Dorsi Muscle and Subcutaneous Fat measurement and other Measurements Related to Beef Carcasses Retail Yield," M.S. thesis, University of Missouri, p. 65, 1964.

¹⁴D. H. Kraft and R. L. Graf, "The Effect of Carcass Grade, Weight and Classification Upon Boneless Beef Yield" *J. of Animal Science*, 18:101-103, 1959.

¹⁵P. P. Graham, R. F. Kelly and J. P. Fontenot, "The Effect of Nutrition and Age on the Carcass Composition of Beef Steers," *J. Animal Science*, 18:1475-76, (Abstr.), 1959.

¹⁶C. L. Cramer and others, "An Analysis of Retail Yield of Beef Carcasses," Research Bulletin 858, Missouri Agri. Exper. Station, April, 1964, p. 6; Pierce, Loc. cit., p. 41-42.

within the grade as percentage of retail yield varies. However, very little has been published concerning the relationship actually existing in the marketing system between retail yield and price. All indications are that retail yield variation should be reflected in the price paid by the packer as well as by the retailer.

This study was designed to determine if prices reflect retail yield and, if so, to what extent. The price paid by the packer to the producer has, in the past, mainly reflected the estimated dressing percentage, weight, and grade of the live animal as well as the general market situation existing at the time of purchase. On the other hand, the retailer reflected grade, weight, current consumer demand, and, to an unknown extent, retail yield in his bid price for sides and quarters. Finish has taken on new importance to the retailer with the realization of the present consumer preferences in beef. Consumer preference for more closely trimmed cuts of beef has resulted in some buyers discriminating against fat wasty carcasses in the packer cooler. The extent of actual estimating of retail yield of live animals by packer buyers is not known nor is it known if their bid prices reflect this new variable.

Objectives

Three major objectives were outlined to be reported upon by this paper:

- I. To determine:
 - a.) The variation in retail yield by packer lots and whether the variation in retail yield is reflected in packer price;
 - b.) The relationship existing between retail yield and price paid by the retailer at the packer level (by weight and grade);
 - c.) The variation in purchase price and retail yield within the grade by retail purchaser.
- II. To evaluate the change in value of carcass brought about by varying percentages of retail yield.
- III. To evaluate the reduction in transportation costs that would result from each of the following situations:
 - a.) The retailer purchasing higher yielding carcasses;
 - b.) The retailer buying carcasses whose retail yield has been increased through fat trim at the packer plant;
 - c.) The retailer buying carcasses trimmed at the packing plant and being credited with the value of the trimmed fat.

PROCEDURE

The empirical data used in this study were gathered from three Missouri packing plants in 1964 and 1965. Data on certain lots of carcasses were collected

for one week (five days) from each of the cooperating packers. Several criteria used to select the plants were:

1. The plant must have capacity to handle a sufficient number of cattle for 100-150 carcasses to be chosen in lots having particular weight and grade characteristics.
2. The plant must slaughter fed animals of varying live weights to insure data on the principal weight group carcasses.
3. The plant management should express a cooperative attitude toward the project.

The lots selected daily from the previous day's slaughter were purchased by the packer from a commission firm or directly from the producer. To meet the objectives of the study, the lots were chosen with the following essentials in mind:

1. All lots consisted of fed steers or heifers which were expected to grade at least Good +.
2. Lots were chosen specifically to gain broader sample coverage in the 500-600#, 600-700#, and 700-800# carcass weight groups. As expected, variation within these lots provided data on carcasses below and above these weight groupings.

Data on 338 carcasses in 14 lots were obtained from Plant A, 589 carcasses in 27 lots from Plant B, and 591 carcasses in 24 lots from Plant C.

The procedure used in the physical collection of data at the plant was similar in all three cases. Carcasses (from the lots selected daily) were tagged, one tag per quarter, upon which was recorded the lot number, carcass number, and section of the carcass (right fore, left hind, etc.). After the carcasses had been "ribbed", hot weight, U. S. Grade, and estimated retail yield of the carcasses were recorded.

The retail yield was estimated by a member of the Animal Husbandry staff of the University. Estimates of retail yield of carcasses were made on the basis of subjective visual appraisal of the carcasses. The ability to estimate retail yield from observation of sides can be readily learned through practice and is very accurate when accomplished by trained individuals. Reports from a USDA study of 162 carcasses indicated that estimations by trained individuals resulted in a .923 correlation coefficient between estimated and actual retail yield.¹⁷

Any unusual characteristics of the various carcasses were noted while the yield was being estimated. These characteristics were grub damage, bruise damage, unusual lean or fat colors and any other factor which might materially influence the value or salability of the carcass. No attempt was made to arrive at actual retail yield as the carcasses were not observed beyond the packer delivery doors.

Packer cost per hundredweight by lot and the lot average dressing percentage were obtained on all but three of the lots marked for study. Even though a few of the carcasses in several lots were not located or various data on them were

¹⁷Pierce, Loc. cit., p. 42.

not collected, they represented a random loss and did not alter the representativeness or reliability of the data obtained from the remainder. Though several buyers of carcasses were not strictly retailers, this study will consider all buyers from the plant as being retailers.

Prices paid by the retailers and their identity were obtained from the plant management. Prices were computed or adjusted to F.O.B. the plant to eliminate the transportation cost variable. Prices of those test carcasses retained for breakdown into wholesale cuts within the plant (hereafter referred to as Break) were the weekly transfer cost used in the internal accounting of each company.

ANALYSIS BY LOT OF RETAIL YIELD AND PACKER PURCHASE PRICE

The influence of expected U.S. Grade on price paid by the packer and the relationship between retail yield and grade warrants consideration of lot data by grade. Table I shows the lot averages for Plant A by grade, Table II the lot averages for Plant B by grade, and Table III the lot averages for plant C by grade. The data reaffirm earlier studies that retail yield averages tend to vary inversely with grade and in addition show that average price tends to vary directly with grade. This would, on the surface, indicate that packers were using expected grade as their main value criterion.

At plant B, if buyers purchased solely on potential retail yield, they would have reversed their buying policy and paid the high price where actually they paid the lowest and vice versa. At plant A, nearly the same situation existed as only lot 14 received a lower price than lot 8 which had the highest retail yield average. The very low price for lot 14 was due chiefly to its being a lot of highly finished heifers. Lot 7 had the lowest retail yield percentage and received the highest price. Only lot 21 had a higher price in Plant C than lot 23 which recorded the lowest estimated retail yield average. The difference in price was only 25¢/cwt. and the difference in yield only 0.41% between lot 21 and 23. Again the lowest priced lot recorded the highest estimated retail yield percentage.

Figures 1, 2, and 3 show diagrammatically the relationship between estimated retail yield and price paid by the packer when the effects of grade are not controlled. Weighted lot average retail yield from Tables I, II, and III compose the horizontal axis and the average lot price the vertical axis. The negative relationship points out that retail yield is not the deciding factor in pricing of live animals by packers. Correlation and regression results for these relationships were obtained and appear on the individual graphs. Most of the price and retail yield averages fall into rather narrow limits (\$2 spread in price and a 2% spread in retail yield). This is explained by the lot selection criteria and by the fact that they are *averages*. Since packers buy on a lot basis it is doubly important that criteria be developed which will recognize small differences in retail yield potential of live animals to insure more equitable pricing.

TABLE I--AVERAGE ESTIMATED RETAIL YIELD AND AVERAGE PRICE
PAID BY PACKER BY LOT AND GRADE; WEIGHTED* LOT AVERAGE RETAIL YIELD; PLANT A

Lot	Good		Choice		Prime		Wtg. Lot Avg. R. Y. %
	Avg. Est. R. Y. %	Avg. Price (Dollars per Cwt.)	Avg. Est. R. Y. %	Avg. Price (Dollars per Cwt.)	Avg. Est. R. Y. %	Avg. Price (Dollars per Cwt.)	
1	70.0	20.29	68.5	20.29	-	-	68.8
2	-	-	69.0	20.55	-	-	69.0
3	73.0	19.55	70.9	19.55	-	-	71.1
4	73.0	20.36	69.3	20.36	-	-	69.5
5	71.2	19.71	69.8	19.71	-	-	70.1
6	70.5	19.75	71.3	19.75	-	-	71.2
7	-	-	66.2	20.80	67.4	20.80	66.6
8	73.4	19.31	72.5	19.31	-	-	73.1
9	-	-	69.3	19.56	68.0	19.56	69.2
10	71.0	19.55	71.2	19.55	-	-	71.1
11	70.4	19.44	70.0	19.44	-	-	70.1
12	70.0	19.49	70.0	19.49	-	-	70.0
13	71.0	20.30	70.5	20.20	70.0	20.30	70.5
14	72.0	18.56	69.4	18.56	-	-	69.7
Range	70.0-73.4	18.56-20.36	66.2-72.5	18.56-20.80	67.38-70.0	19.56-20.80	
Weighted* Average of all Lots	71.6	19.59	69.9	19.78	68.4	20.40	

*Weighted by number of carcasses and sides in each lot.

TABLE II--AVERAGE ESTIMATED RETAIL YIELD AND AVERAGE PRICE
PAID BY PACKER BY LOT AND GRADE; WEIGHTED* LOT AVERAGE RETAIL YIELD; PLANT B

Lot	Good		Choice		Prime		Wtg. Lot Avg. R. Y. %
	Avg. Est. R. Y. %	Avg. Price (Dollars per Cwt.)	Avg. Est. R. Y. %	Avg. Price (Dollars per Cwt.)	Avg. Est. R. Y. %	Avg. Price (Dollars per Cwt.)	
1	69.3	24.25	68.6	24.25	-	-	68.8
2	71.2	23.38	70.3	23.38	-	-	70.8
3	-	-	63.1	24.50	-	-	63.1
4	68.8	24.00	68.0	24.00	-	-	68.1
5	69.7	23.25	69.2	23.25	-	-	69.4
6	71.1	22.00	70.3	22.00	-	-	70.6
7	71.0	22.86	71.0	22.86	-	-	71.0
8	70.0	22.00	69.9	22.00	-	-	69.9
9	73.3	21.75	71.9	21.75	-	-	72.6
10	70.0	23.50	69.1	23.50	-	-	69.7
11	-	-	69.1	22.83	-	-	69.1
12	69.6	22.25	71.5	22.25	-	-	71.1
13	-	-	70.4	22.50	-	-	70.4
14	69.6	23.20	69.6	23.20	-	-	69.6
15	72.2	21.85	71.9	21.85	-	-	72.0
16	70.7	23.25	71.1	23.25	-	-	70.9
17	72.0	22.85	72.2	22.85	-	-	72.2
18	71.0	23.25	71.0	23.25	-	-	71.0
19	-	-	70.3	22.25	-	-	70.3
20	70.0	23.00	70.2	23.00	-	-	70.2

TABLE II (Continued)

Lot	Good		Choice		Prime		Wtg. Lot Avg. R.Y. %
	Avg. Est. R. Y. %	Avg. Price (Dollars per Cwt.)	Avg. Est. R. Y. %	Avg. Price (Dollars per Cwt.)	Avg. Est. R. Y. %	Avg. Price (Dollars per Cwt.)	
21	No data						
22	73.00	21.18	70.9	21.18	-	-	71.0
23	70.8	23.24	71.0	23.24	-	-	71.0
24	73.0	22.50	70.8	22.50	-	-	71.1
25	-	-	66.8	23.29	64.0	23.29	66.5
26	-	-	72.2	23.00	-	-	72.2
27	74.8	20.04	74.4	20.04	-	-	74.5
Range	68.8-74.8	20.04-24.25	63.1-74.4	20.04-24.50	64.0	23.29	
Weighted* average of all Lots							
	71.0	22.71	70.2	22.82	64.0	23.29	

*Weighted by the number of carcasses and sides in each lot.

TABLE III--AVERAGE ESTIMATED RETAIL YIELD AND AVERAGE PRICE
PAID BY PACKER BY LOT AND GRADE; WEIGHTED* LOT AVERAGE RETAIL YIELD; PLANT C

Lot	Good		Choice		Prime		Wtg. Lot Avg. R. Y. %
	Avg. Est. R. Y. %	Avg. Price (Dollars per Cwt.)	Avg. Est. R. Y. %	Avg. Price (Dollars per Cwt.)	Avg. Est. R. Y. %	Avg. Price (Dollars per Cwt.)	
1	70.0	23.46	71.7	23.46	-	-	71.6
2	74.5	23.00	73.0	23.00	-	-	73.2
3	73.5	23.02	71.3	23.02	-	-	71.5
4	-	-	72.6	22.67	-	-	72.6
5	70.5	23.09	70.2	23.09	-	-	70.3
6	-	-	69.9	24.50	71.3	24.50	70.1
7	-	-	68.1	24.86	68.5	24.86	68.1
8	-	-	70.8	24.19	71.8	24.19	70.9
9	-	-	71.1	23.58	68.3	23.58	70.4
10	-	-	70.0	24.75	69.6	24.75	69.9
11	70.6	22.73	70.5	22.73	68.3	22.73	69.9
12	71.7	23.15	72.6	23.15	74.0	23.15	72.5
13	72.0	24.00	70.7	24.00	70.7	24.00	70.8
14	74.5	22.60	72.4	22.60	-	-	72.7
15	-	-	69.2	23.78	68.8	23.78	69.0
16	71.8	24.22	69.7	24.22	-	-	70.0
17	73.4	23.49	71.0	23.49	72.3	23.49	71.8
18	74.6	19.28	72.5	19.28	-	-	73.5
19	No data						
20	No data						
21	-	-	67.8	25.00	-	-	67.8
22	71.3	23.32	68.8	23.32	67.5	23.32	69.5
23	-	-	67.7	24.75	65.7	24.75	67.4
24	67.5	24.50	68.6	24.50	68.0	24.50	68.5
Range	67.5-74.6	19.28-24.50	67.7-73.0	19.28-25.00	65.7-74.0	22.73-24.86	
Weighted* average of all Lots							
	72.3	22.61	70.1	23.73	69.2	23.97	

*Weighted by the number of carcasses and sides in each lot.

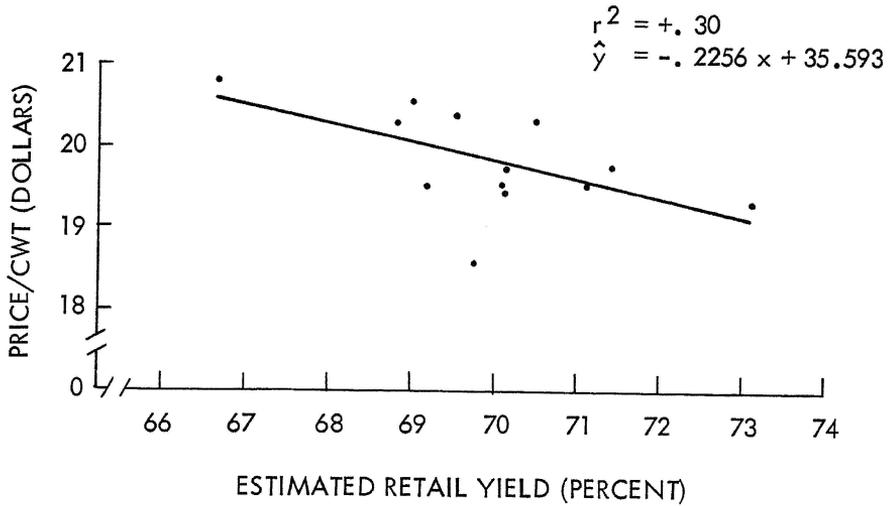


Fig. 1—Relationship of price paid by Packer A and estimated retail yield by lots.

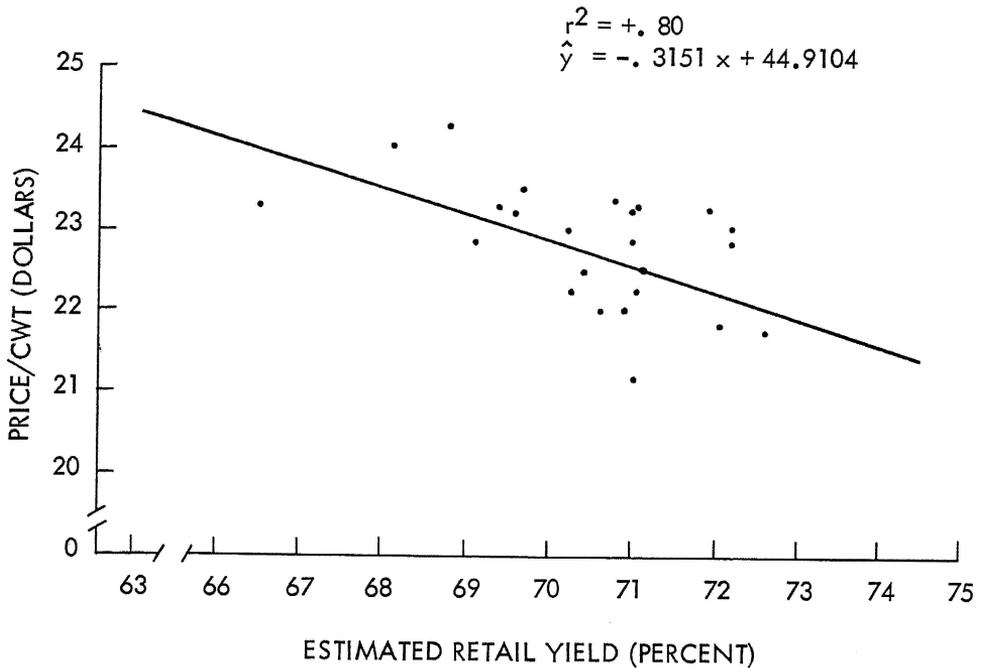
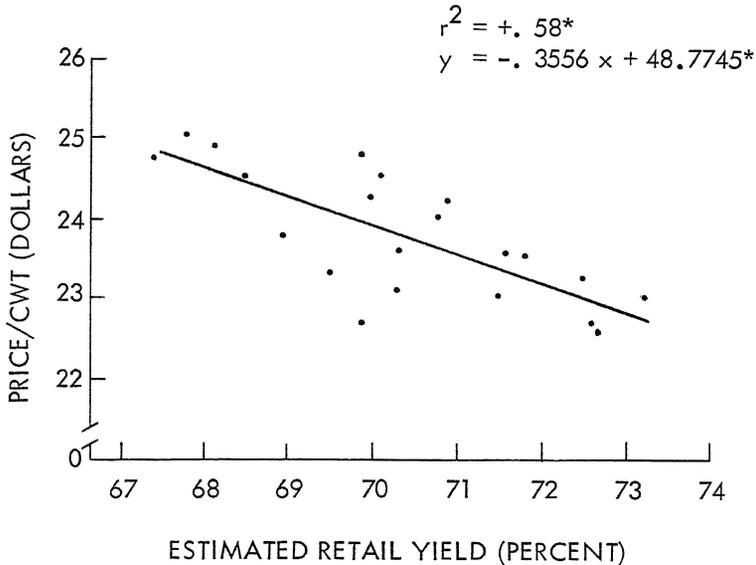


Fig. 2—Relationship between price paid by Packer B and estimated retail yield by lots.



*Lot 18 (Table III) omitted as contained several ungraded carcasses.

Fig. 3—Relationship between price paid by Packer C and estimated retail yield by lots.

To determine how the various lots differed in retail value due to differences in average estimated retail yield, an analysis as summarized in Tables IV, V, and VI was made. These tables reveal some interesting observations as to the differences in retail value and price paid by the packer expressed in dollars per cwt. of live animal. First, however, an explanation of how these tables were constructed is necessary. This will be handled by explanation of individual columns in the table.

1. Column 1 is the average live weight of an animal from the lot. It was obtained through use of the average dressing percent (Column 3) and the average hot weight of a carcass from the lot (Column 2).
2. Column 2 is the average hot weight of a carcass from the lot.
3. Column 3 is the average dressing percentage for the lot obtained from plant records.
4. Column 4 is the average weight of retail cuts per carcass. The average hot weight per carcass was corrected for shrinkage by an assumed 3 percent loss factor. This calculated average shipping weight was multiplied by the average estimated retail yield.

5. These are the assumed composite carcass prices per pound of retail cuts. The prices for Choice grade were obtained by personal communication from the USDA Agricultural Marketing Service and are weekly national averages for the period of the three tests. The prices for Good and Prime grades were derived from the Choice price by use of a correction factor as used in Research Bulletin 858.¹⁸
6. Column 6 is the average value of the retail cuts obtained per 100 pounds of live animal. This is computed by dividing the average retail carcass value—average weight of retail cuts per carcass (Column 4) times assumed composite carcass price by grade (Column 5)—by average live weight (Column 1).
7. Column 7 is the weighted average retail value per cwt. of live animal by lot. This weighted average value is now comparable to the price paid by the packer.
8. Column 8 is the price per cwt. live animal that the packer paid for the cattle in the lot.
9. Column 9 is the return to the marketing system (from packer through the retailer).¹⁹ This is the difference between the packer buying price (Column 8) and the retail value of 100 pounds of live animal (Column 7).
10. Column 10 is the deviations of lot “spreads” (Column 9) from the mean “spread” of all the lots. If we assume the average of the spreads listed in Column 9 is a logical and realistic measure with which to compare the spreads of individual lots these deviations have a special meaning which is discussed later.

¹⁸Cramer, *Loc. cit.*, p. 32.

¹⁹This assumes the composite carcass values are accurate and omits the value of by-products.

TABLE IV--CALCULATED FARM TO RETAIL SPREAD BY LOT AND DEVIATIONS
OF INDIVIDUAL LOT SPREADS FROM THE MEAN SPREAD OF ALL LOTS; PLANT A

Lot & Grade	1	2	3	4	5	6	7	8	9	10
	Avg. Live Weight (lbs.)	Avg. Hot Weight (lbs.)	Avg. Dress. (%)	Wt. of Retail Cuts per Carcass (lbs.)	Retail Price per Pound (\$)	Retail Value per Cwt. Live Wt. (\$)	Wtd. Retail Value per Cwt. Live Wt. (\$)	Price Packer Paid per Cwt. (\$)	Calculated Spread per Cwt. (\$)	Deviations From Mean Spread (\$)
1 Gd	1279	760		516.2	.7343	29.64				
Ch	1178	699	59.4	464.9	.7423	29.30	29.37	20.29	9.08	-2.01
2 Ch	1107	691	62.4	462.6	.7423	31.02	31.02	20.55	10.47	-.62
3 Gd	977	580		410.7	.7343	30.87				
Ch	1109	658	59.3	452.6	.7423	30.29	30.35	19.55	10.80	-.29
4 Gd	905	558		387.8	.7343	31.46				
Ch	1135	700	61.7	470.8	.7423	30.79	30.82	20.36	10.46	-.63
5 Gd	1232	743		513.4	.7343	30.60				
Ch	1211	730	60.3	495.4	.7423	30.37	30.42	19.71	10.71	-.38
6 Gd	1129	681		465.7	.7343	30.29				
Ch	1068	644	60.3	445.8	.7423	30.99	30.91	19.75	11.16	+0.07
7 Ch	984	615		395.0	.7423	29.80				
Pr	892	558	62.5	364.6	.7829	32.00	30.68	20.80	9.88	-1.21
8 Gd	981	573		408.3	.7343	30.56				
Ch	920	537	58.4	378.0	.7423	30.50	30.54	19.31	11.23	+1.14
9 Ch	914	569		383.2	.7423	31.12				
Pr	1027	640	62.3	422.1	.7829	32.18	31.26	19.56	11.70	+0.61

TABLE IV (Continued)

Lot & Grade	1 Avg. Live Weight (lbs.)	2 Avg. Hot Weight (lbs.)	3 Avg. Dress. (%)	4 Wt. of Retail Cuts per Carcass (lbs.)	5 Retail Price per Pound (\$)	6 Retail Value per Cwt. Live Wt. (\$)	7 Wtd. Retail Value per Cwt. Live Wt. (\$)	8 Price Packer Paid per Cwt. (\$)	9 Calculated Spread per Cwt. (\$)	10 Deviations From Mean Spread (\$)																																																																					
10 Gd	1111	685	61.6	471.8	.7343	31.18	31.45	19.55	11.90	+.81																																																																					
Ch	1091	672		464.3	.7423	31.59					11 Gd	1088	670	61.6	457.8	.7343	30.90	31.02	19.44	11.58	+.49	Ch	1153	710	482.1	.7423	31.04	12 Gd	1018	628	61.7	426.4	.7343	30.76	31.10	19.49	11.61	+.52	Ch	1061	654	444.6	.7423	31.11	13 Gd	1018	629	61.8	433.2	.7343	31.25	31.67	20.30	11.37	+.28	Ch	970	599	410.1	.7423	31.38	Pr	992	613	416.2	.7829	32.85	14 Gd	698	444	63.6	310.1	.7343	32.62	31.88	18.56	13.32	+2.23	Ch
11 Gd	1088	670	61.6	457.8	.7343	30.90	31.02	19.44	11.58	+.49																																																																					
Ch	1153	710		482.1	.7423	31.04					12 Gd	1018	628	61.7	426.4	.7343	30.76	31.10	19.49	11.61	+.52	Ch	1061	654	444.6	.7423	31.11	13 Gd	1018	629	61.8	433.2	.7343	31.25	31.67	20.30	11.37	+.28	Ch	970	599	410.1	.7423	31.38	Pr	992	613		416.2	.7829	32.85					14 Gd	698	444	63.6	310.1	.7343	32.62	31.88	18.56	13.32	+2.23	Ch	865	550	370.1	.7423	31.76							
12 Gd	1018	628	61.7	426.4	.7343	30.76	31.10	19.49	11.61	+.52																																																																					
Ch	1061	654		444.6	.7423	31.11					13 Gd	1018	629	61.8	433.2	.7343	31.25	31.67	20.30	11.37	+.28	Ch	970	599	410.1	.7423	31.38	Pr	992	613		416.2	.7829	32.85					14 Gd	698	444	63.6	310.1	.7343	32.62	31.88	18.56	13.32	+2.23	Ch	865	550	370.1	.7423	31.76																								
13 Gd	1018	629	61.8	433.2	.7343	31.25	31.67	20.30	11.37	+.28																																																																					
Ch	970	599		410.1	.7423	31.38																																																																									
Pr	992	613		416.2	.7829	32.85					14 Gd	698	444	63.6	310.1	.7343	32.62	31.88	18.56	13.32	+2.23	Ch	865	550	370.1	.7423	31.76																																																				
14 Gd	698	444	63.6	310.1	.7343	32.62	31.88	18.56	13.32	+2.23																																																																					
Ch	865	550		370.1	.7423	31.76																																																																									

TABLE V--CALCULATED FARM TO RETAIL SPREAD BY LOT AND DEVIATIONS
OF INDIVIDUAL LOT SPREADS FROM THE MEAN SPREAD OF ALL LOTS; PLANT B

Lot & Grade	1	2	3	4	5	6	7	8	9	10
	Avg. Live Weight (lbs.)	Avg. Hot Weight (lbs.)	Avg. Dress. (%)	Wt. of Retail Cuts per Carcass (lbs.)	Retail Price per Pound (\$)	Retail Value per Cwt. Live Wt. (\$)	Wtd. Retail Value per Cwt. Live Wt. (\$)	Price Packer Paid per Cwt. (\$)	Calculated Spread per Cwt. (\$)	Deviations From Mean Spread (\$)
1 Gd	1219	756		508.1	.7901	32.93				
Ch	1251	776	62.0	515.9	.7981	32.91	32.92	24.25	8.67	-1.40
2 Gd	1102	643		444.3	.7901	31.85				
Ch	1152	673	58.4	457.3	.7981	31.68	31.78	23.38	8.40	-1.67
3 Ch	1422	913	64.2	558.8	.7981	31.36	31.36	24.50	6.86	-3.21
4 Gd	1125	703		469.2	.7981	32.95				
Ch	1122	701	62.6	462.7	.7981	32.91	32.92	24.00	8.92	-1.15
5 Gd	1163	721		487.9	.7901	33.15				
Ch	1218	755	61.0	507.0	.7981	33.22	33.20	23.25	9.95	-.12
6 Gd	1265	760		524.4	.7901	32.75				
Ch	1317	791	60.1	539.8	.7981	32.71	32.73	22.00	10.73	+.66
7 Gd	1036	632		434.5	.7901	33.14				
Ch	920	561	61.0	386.5	.7981	33.53	33.50	22.86	10.64	+.57
8 Gd	1248	738		501.4	.7901	31.74				
Ch	1204	712	59.2	483.0	.7981	32.02	31.96	22.00	9.96	-.11
9 Gd	951	558		396.4	.7901	32.93				
Ch	967	568	58.7	396.2	.7981	32.70	32.82	21.75	11.07	+1.00
10 Gd	1091	657		446.3	.7901	32.32				
Ch	1143	688	60.2	461.5	.7981	32.22	32.28	23.50	8.78	-1.29
11 Ch	1066	654	61.4	438.4	.7981	32.82	32.82	22.83	9.99	-.08

TABLE V (Continued)

12 Gd	1007	616		416.1	.7901	33.86					
Ch	877	537	61.2	372.1	.7981	32.65	33.59	22.25	11.34	+1.27	
13 Ch	1114	677	60.8	462.3	.7981	33.12	33.12	22.50	10.62	+ .55	
14 Gd	1163	703		474.5	.7901	32.24					
Ch	1196	723	60.5	488.2	.7981	32.58	32.54	23.20	9.34	- .73	
15 Gd	980	585		409.4	.7901	33.01					
Ch	990	591	59.7	412.0	.7981	33.21	33.10	21.85	11.25	+1.18	
16 Gd	1191	729		499.5	.7901	33.14					
Ch	1129	690	61.2	476.1	.7981	33.66	33.45	23.25	10.20	+ .13	
17 Gd	823	484		338.0	.7901	32.45					
Ch	849	499	58.8	349.9	.7981	32.89	32.84	22.85	9.99	- .08	
18 Gd	1121	677		466.3	.7901	32.87					
Ch	1065	643	60.4	442.8	.7981	33.18	33.14	23.25	9.89	- .18	
19 Ch	859	526	61.2	358.8	.7981	33.34	33.34	22.25	11.09	+1.02	
20 Gd	998	590		401.0	.7901	31.75					
Ch	1017	602	59.2	409.8	.7981	32.16	32.10	23.00	9.10	- .97	
21 Gd	No Data										
Ch											
22 Gd	922	554		392.3	.7901	33.62					
Ch	1016	610	60.1	419.6	.7981	32.96	33.00	23.46	11.82	+1.75	
23 Gd	1121	669		458.9	.7901	32.34					
Ch	1080	644	59.7	443.8	.7981	32.80	32.71	23.24	9.47	- .60	
24 Gd	957	574		406.5	.7901	33.56					
Ch	1111	667	60.0	458.1	.7981	32.91	33.00	22.50	10.50	+ .43	
25 Ch	1129	707		458.3	.7981	32.40					
Pr	1108	694	62.6	430.8	.8387	32.61	32.42	23.29	9.13	- .94	
26 Ch	1012	614	60.7	430.0	.7981	33.91	33.91	23.00	10.91	+ .84	
27 Gd	940	544		394.9	.7901	33.19					
Ch	965	558	57.9	402.8	.7981	33.31	33.27	20.04	13.28	+3.16	

TABLE VI--CALCULATED FARM TO RETAIL SPREAD BY LOT AND DEVIATIONS
OF INDIVIDUAL LOT SPREADS FROM THE MEAN SPREAD OF ALL LOTS; PLANT C

Lot & Grade	1	2	3	4	5	6	7	8	9	10
	Avg. Live Weight (lbs.)	Avg. Hot Weight (lbs.)	Avg. Dress. (%)	Wt. of Retail Cuts per Carcass (lbs.)	Retail Price per Pound (\$)	Retail Value per Cwt. Live Wt. (\$)	Wtd. Retail Value per Cwt. Live Wt. (\$)	Price Packer Paid per Cwt. (\$)	Calculated Spread per Cwt. (\$)	Deviations From Mean Spread (\$)
1 Gd	1079	647		439.7	.8100	33.01				
Ch	998	598	60.0	416.4	.8180	34.13	34.02	23.46	10.56	-.07
2 Gd	904	528		381.6	.8100	34.19				
Ch	1037	605	58.4	428.8	.8180	33.82	33.88	23.00	10.88	-.39
3 Gd	1050	623		444.2	.8100	34.27				
Ch	988	586	59.3	405.0	.8180	33.53	33.60	23.02	10.58	-.09
4 Ch	1024	620	60.5	436.4	.8180	34.86	34.86	22.67	12.19	-1.70
5 Gd	885	534		365.0	.8100	33.41				
Ch	1007	607	60.3	413.9	.8180	33.62	33.59	23.09	10.50	-.01
6 Ch	1148	669		453.8	.8180	32.34				
Pr	1106	645	58.3	446.2	.8586	34.64	32.54	24.50	8.04	+2.45
7 Ch	1152	706		466.5	.8180	33.13				
Pr	1093	670	61.3	445.2	.8586	34.97	33.23	24.86	8.37	+2.12
8 Ch	1084	629		431.6	.8180	32.57				
Pr	1066	618	58.0	430.4	.8586	34.67	32.87	24.19	8.68	+1.81
9 Ch	1019	617		426.0	.8180	34.20				
Pr	1191	722	60.6	478.1	.8586	34.47	34.27	23.58	10.69	-.20
10 Ch	1083	682		463.2	.8180	34.99				
Pr	1039	654	63.0	442.0	.8586	36.53	35.55	24.75	10.80	-.31

TABLE VI (Continued)

21 Ch	987	626	63.4	411.7	.8180	34.12	34.12	25.00	9.12	+1.37
22 Gd	1017	609		421.2	.8100	33.55				
Ch	1064	637	59.9	425.7	.8180	32.73	33.01	23.32	9.69	+ .80
Pr	1145	686		449.1	.8586	33.68				
23 Ch	1186	740		485.9	.8180	33.51				
Pr	1207	753	62.4	479.9	.8586	34.14	33.65	24.75	8.90	+1.59
24 Gd	1120	695		455.4	.8100	32.93				
Ch	1112	691	62.1	459.8	.8180	33.82	33.91	24.50	9.41	+1.08
Pr	1087	675		445.4	.8586	35.18				

Several of the interesting aspects revealed in Tables IV, V and VI concerning the relationship between packer price and estimated retail yield are:

1. There are substantial differences among lots in the magnitude of the spread. At Plant A the range in individual lot spreads were from \$9.08 to \$13.32 or \$4.24, at Plant B \$6.86 to \$13.23 or \$6.37 and at Plant C \$8.37 to \$13.81 or \$5.44. The average spread at Plant A was \$11.09, Plant B \$10.07 and Plant C \$10.49. So Plant A had a \$1.02 advantage in spread over Plant B. However these spreads are not solely the packer's but are shared by the retailers (they are farm-retail spreads). The spreads include only the carcasses studied, not all carcasses processed by the plant.
2. An interesting observation is possible when the differences in Column 9 are compared to the average estimated retail yield of these same lots found in Tables I, II, and III. There is an inclination of spread to increase as retail yield increases. This positive relationship is especially noticeable when estimated retail yield is plotted against these differences. Figure 4 shows this for Plant B. The other plants have similar relationships. Here again is evidence that the packer is buying mainly on potential grade and

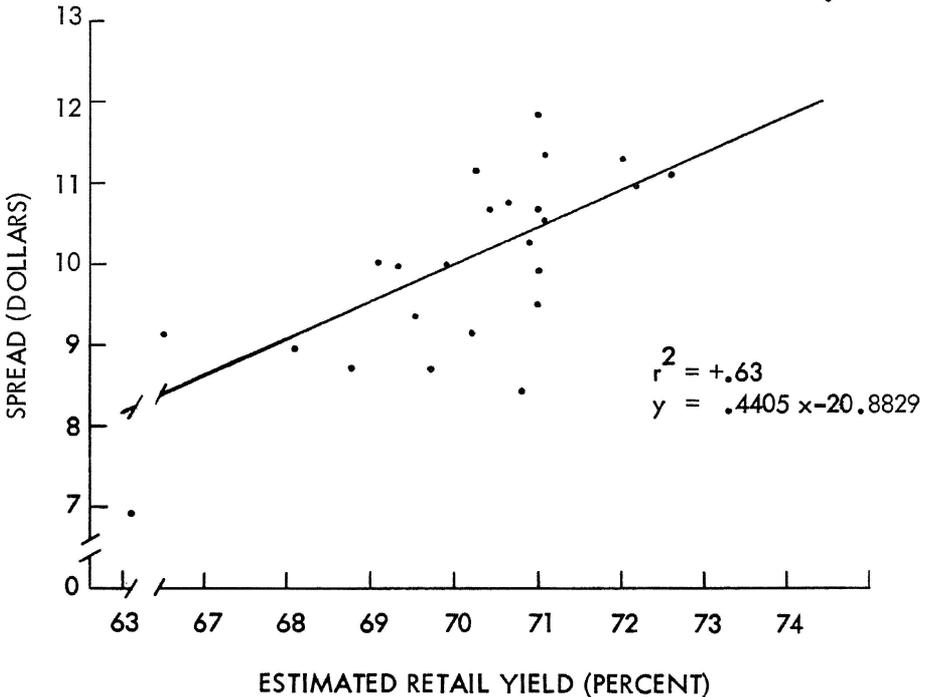


Fig. 4—Relationship between calculated farm to retail "spread" and average estimated retail yield by lots; Plant B.

dressing percentage, the two variables whose influences are controlled within the tables.

3. If the assumption is made that the mean spread for the lots studied from each plant reflects pricing accuracy for all factors other than retail yield these deviations take on special meaning. If estimated retail yield were closely observed by packer buyers, and if packers paid more for the higher yielding cattle, those lots which have negative deviations should have received less from the packer buyer.²⁰ Of course, under the same assumption, the plus deviations would indicate the packer should have paid more for the cattle. The size of the deviation would be indicative of the change in payment required provided that the mean spread were the actually existing spread or one calculated as being the "ideal" spread.

The data reveal that estimated retail yield of live animals was not being utilized to any great extent in packer buying of lots of cattle. Difficulty has been encountered in setting up standards in live animal characteristics which are positively correlated with retail yield. The USDA, in a test of 1,000 cattle, found that in about 50% of the live cattle they could estimate the yield of boneless cuts from the round, loin, rib, and chuck to within 1% of the actual carcass cut out.²¹ They were also able to estimate to within 2% in about 80% of the cattle.

In a test of 32 steers, the live animal measurements of circumference of middle, width at hocks, and dept of rear flanks, were found to be negatively correlated with primal yield.²² No other measurements were found by this study to be indicative of retail yield. However, with experience and the knowledge of the relationship of retail yield to grade and finish, a trained cattle buyer should be able to estimate retail yield of live animals with reasonable degree of accuracy.

RELATIONSHIP BETWEEN RETAIL YIELD AND WHOLESALE PRICE

Another important area in retail yield pricing accuracy at the packer level is the relationship between retail yield and wholesale price. Because of the influence of grade on price, a separate analysis again is made for each grade. Unlike the lot data analysis where all carcasses were included in the analysis, the analysis of data by retail purchaser will exclude all carcasses whose value has been changed due to trimming, grub damage, bruise damage, dark cutters, etc.

²⁰The assumption must also be made that composite carcass values are accurate, known by the retailer and are not subject to wide fluctuations.

²¹J. C. Pierce, "The Producers Stake in a Dual Grading System for Beef," Address to the 50th Annual Feeders Day Program, University of Nebraska, Lincoln, Nebraska, April 18, 1962, p. 6.

²²L. W. Eaton, "Relationships of Live Animal Measurements and Scores with Various Carcass Traits and Average Daily Gain," M.S. thesis, University of Missouri, 1963, p. 53.

The second part of the first objective of this study was to investigate the relationship between retail yield and the wholesale price within the grade for carcasses and sides of various weight groups. Graphing the actual data revealed that the relationship was much too random and disorderly for correlation and regression analysis to be meaningful. Prices paid by the retailer are closely centered around several prevalent prices; however, the prices are representative of the actual pricing situation. The small (\$1-2) amount of price variation takes on visual meaning when the prices per cwt. of carcasses and sides are plotted against estimated retail yields of the same carcasses and sides.

Figures 5 through 7 show these relationships by various weight groups, grades and by plant. Each dot on the graphs represents a single carcass or side of the particular weight and grade. Carcasses going to Break are excluded as well as all irregular carcasses (description previously made). The relationships for the three plants by all grades and weights were plotted and were similar to the ones included in this bulletin.

It is obvious that no clear relationship existed between estimated retail yield and retailer purchase price when the influence of grade and weight are controlled. High yielding carcasses bring both high and low prices from the retailer and the low yielding carcasses do likewise.

The lack of any positive or negative relationship between wholesale price and retail yield indicates that there is no consistent and concerted effort on the part of most retailers to buy beef on the basis of retail yield. Evidently the two variables whose influence was controlled in making these comparisons (namely weight and grade) exert the predominant force on retailer purchase prices. Very little would be gained by making any comparisons unless these two variables are controlled due to their tremendous influence on price.

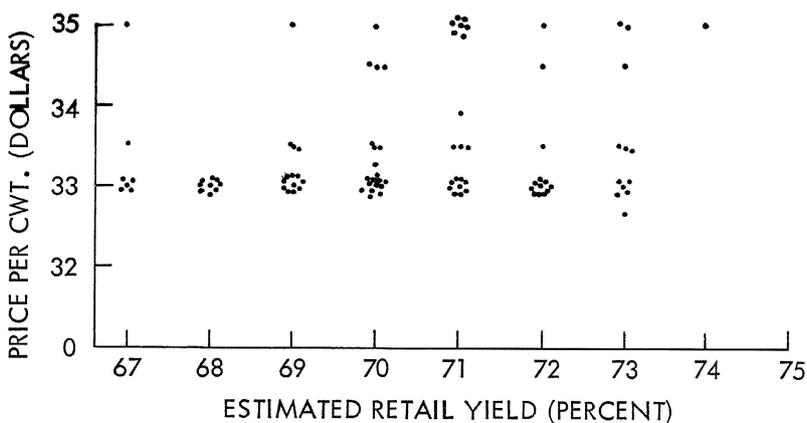


Fig. 5—Relationship between wholesale price and estimated retail yield for Choice grade 600-700# and sides; Plant A.

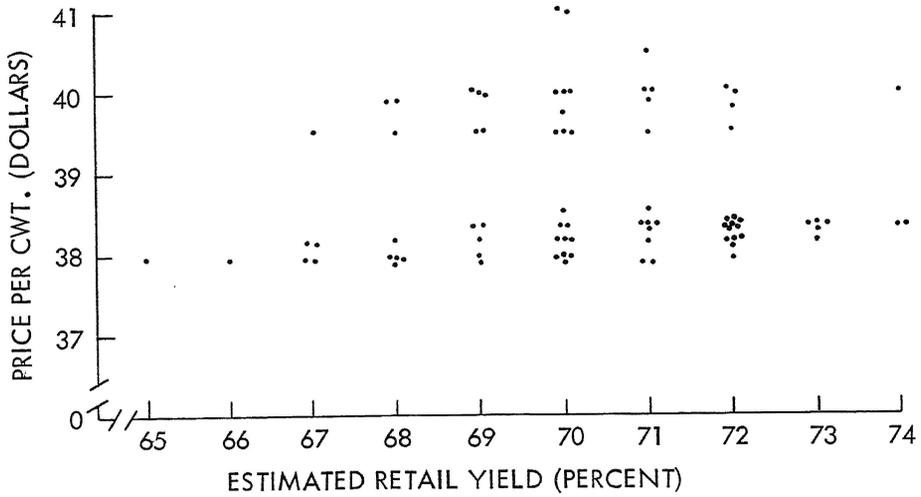


Fig. 6—Relationship between wholesale price and estimated retail yield Choice grade 600-700# carcasses and sides; Plant B.

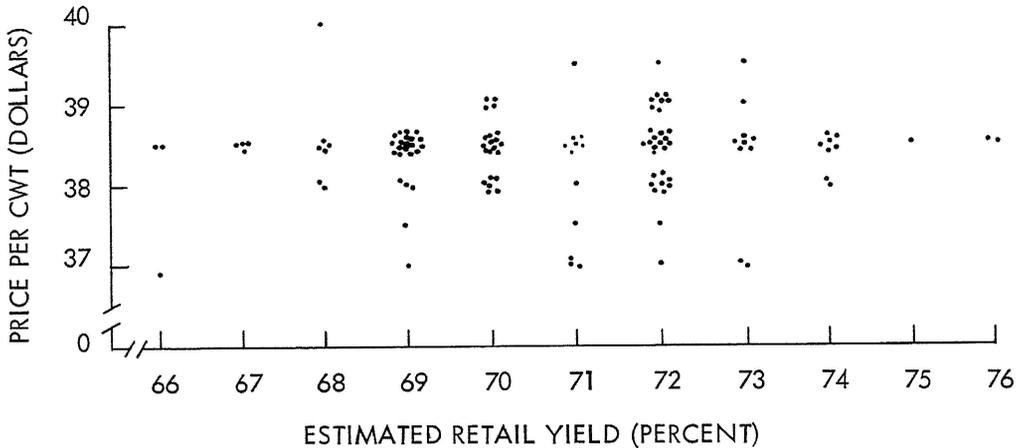
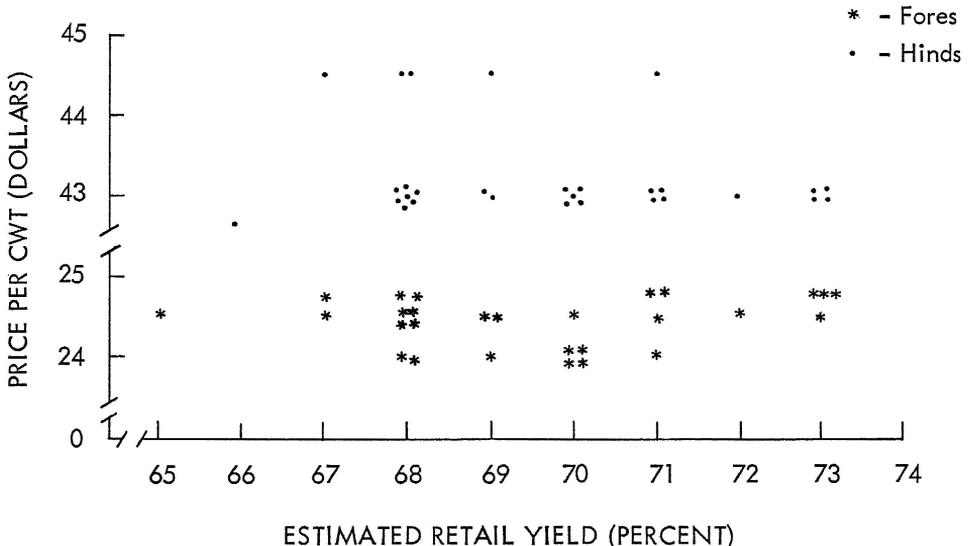


Fig. 7—Relationship between wholesale price and estimated retail yield Choice grade 600-700# carcasses and sides; Plant C.

The variables of grade and weight are largely the deciding factor under absentee buying where the buyer does not judge each carcass individually. Since grade standards are well known by all in the trade they, along with weight and sex, provide the major specifications upon which cattle and carcasses are purchased by phone, letter, wire, etc. Individual buyers have set their own cutability standards and have communicated these standards to the packers or to their company employee buyers. Wider use of these cutability standards by retail buyers would benefit those using them.

Even though the study of carcasses and sides was the chief concern of this study, many of the carcasses tagged for observation were sold as quarters (fores or hinds). The question naturally arises as to the relationship of estimated retail yield and retailer purchase price for fores and hinds. Is the relationship similar to that encountered for carcasses and sides or is it much different? Some retail purchasers bought almost exclusively fores and hinds as others had carcasses and sides. Again there is a small variation in price by grade and weight for each plant, especially in fores.

Figures 8, 9, and 10 show graphically the relationship of price and retail yield for Choice fores and hinds derived from 600-700 weight carcasses. The dots on the graphs represent fore purchases whereas the x's represent a hind purchase. As with carcasses and sides no definite relationship exists. Therefore it appears, at least from these data, that fores and hinds were purchased using standards similar to those used in buying carcasses and sides. Any statement concerning pricing accuracy at the packer level which holds for carcasses and sides seems also to apply to fores and hinds.



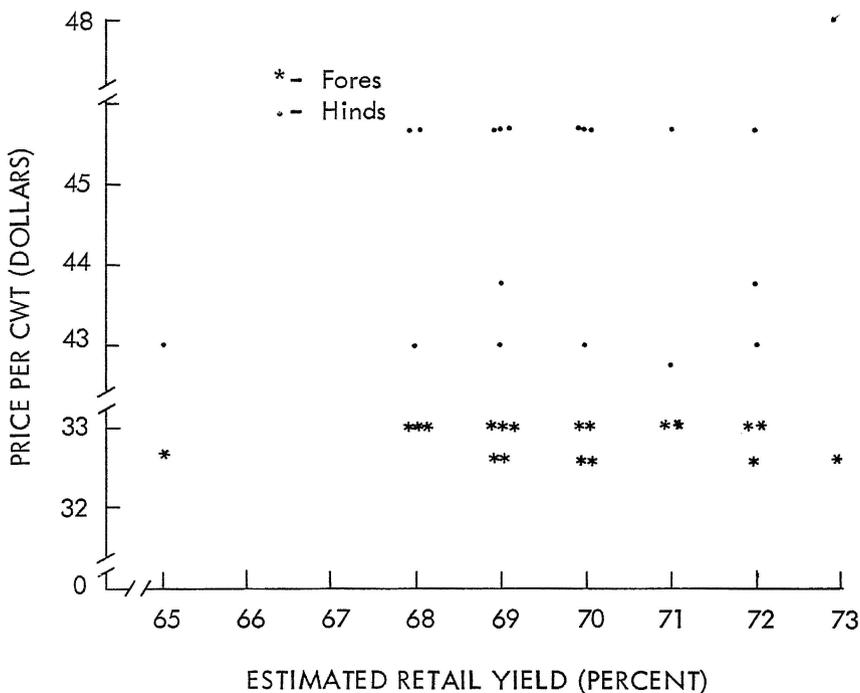


Fig. 9—Relationship between wholesale price and estimated retail yield Choice grade 600-700# fores and hinds; Plant B.

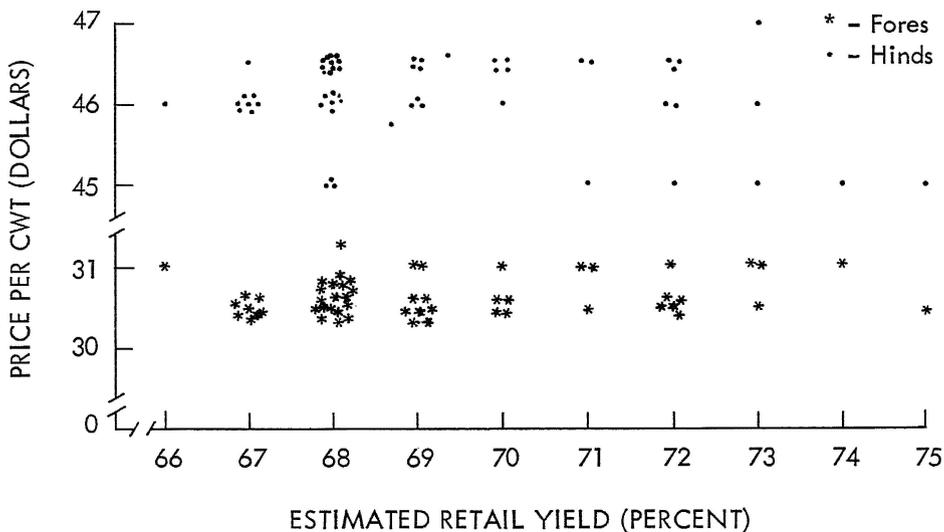


Fig. 10—Relationship between wholesale price and estimated retail yield Choice grade 600-700# fores and hinds; Plant C.

Analysis of Price-Retail Yield Relationship by Individual Purchaser

To this point retail purchasers have been grouped together to show their composite buying practices as they relate to differences in retail yield. This grouping has resulted in no discernible relationship in their purchase prices and the estimated retail yield of the carcasses and sides as well as quarters that they buy. Does this apparent lack of consideration of retail yield as value determinant hold true for all purchasers or are some aware of this additional value standard? If the latter is true, which purchasers are actively buying on the basis of retail yield potential and to what extent? Answers to these questions and others were sought when the analysis reported in this section was underway.

Tables VII, VIII, and IX show the carcasses and sides purchased from the three plants broken down by grades, weight and purchaser. All carcasses having any unusual characteristics which might change their normal value are omitted. "Break" is considered as a retail purchaser for these tables. The range, average retail yield and average price for all the purchasers are at the bottom of the tables by weight and grade.

Again no consistent pattern is present when all purchasers are considered. Both high and low purchase prices are consistent with low yielding carcasses. The same situation exists for high yielding carcasses. There maybe a very slight tendency for price to drop as retail yield rises; however, it is too small to be significant. Some of the purchasers are getting higher yielding carcasses and are generally paying above average for them. Some purchasers operate in two or more of these plants and are relatively consistent in their retail yield and prices paid. The following are four purchasers buying from two or more plants: A-8, B-7, and C-15; A-10, B-12, and C-27; A-6 and C-18; and A-9 and B-9.

At Plant A one purchaser (A-8) paid above average prices for slightly above average yielding carcasses; and at Plant B the same purchaser (B-7) received generally lower than average yielding carcasses at higher than average prices; and at Plant C the same purchaser (C-15) received higher yielding carcasses and paid higher than average prices. Another purchaser at Plant A (A-10) paid more than average prices for lower than average yielding carcasses; at Plant B the same purchaser (B-12) paid generally more than average prices for lower than average yielding carcasses; and at Plant C the same purchaser (C-27) paid a higher than average price for generally lower than average yielding carcasses.

A third purchaser at Plant A (A-6) generally paid less than average prices for slightly above average yielding carcasses; at Plant C the same purchaser (C-18) paid mostly less than average prices for higher yielding carcasses of Choice grade and paid less than average prices for lower than average yielding carcasses of Prime grade. A fourth purchaser at Plant A (A-9) paid generally higher than average prices for lower yielding carcasses of Good grade and paid higher prices for generally higher than average yielding carcasses of Choice grade; the same purchaser at Plant B (B-9) paid higher than average prices for both Good and

TABLE VII--AVERAGE ESTIMATED RETAIL YIELD AND AVERAGE WHOLESALE
PRICE BY PURCHASER, WEIGHT AND GRADE; PLANT A

Sides and Carcasses Only										
Purchaser and Grade	500# and Below		500-600		600-700		700-800		800 and Above	
	Avg. R. Y. (%)	Avg. P. (\$)								
Break										
Good	74.0	32.50	--	--	--	--	70.4	32.50	70.0	32.50
Choice	--	--	67.9	33.50	68.2	33.50	69.2	33.50	68.1	33.50
Prime	70.5	34.00	68.1	34.00	68.2	34.00	68.3	34.00	--	--
A-1										
Choice	--	--	72.0	34.50	71.2	34.50	--	--	--	--
A-2										
Choice	--	--	72.0	33.50	70.8	33.50	70.0	33.50	--	--
A-3										
Choice	--	--	--	--	70.4	33.00	66.7	33.00	--	--
A-4										
Choice	--	--	--	--	69.6	33.00	68.0	33.00	70.0	33.00
A-5										
Good	--	--	--	--	71.0	32.25	--	--	--	--
Choice	--	--	--	--	70.3	33.00	71.5	33.00	--	--
A-6										
Good	--	--	--	--	71.0	32.75	70.5	32.75	--	--
Choice	--	--	--	--	70.1	33.00	70.5	33.00	--	--
A-7										
Choice	--	--	--	--	69.2	33.00	68.6	33.00	--	--
A-8										
Good	--	--	--	--	71.0	33.50	--	--	--	--
Choice	--	--	71.1	35.00	71.0	35.00	71.4	35.00	--	--

TABLE VII (Continued)

Sides and Carcasses Only											
Purchaser and Grade	500 [#] and Below		500-600		600-700		700-800		800 and Above		
	Avg. R. Y. (%)	Avg. P. (\$)	Avg. R. Y. (%)	Avg. P. (\$)	Avg. R. Y. (%)	Avg. P. (\$)	Avg. R. Y. (%)	Avg. P. (\$)	Avg. R. Y. (%)	Avg. P. (\$)	
A-9											
Good	74.0	33.50	72.8	33.50	70.0	33.50	--	--	--	--	
Choice	71.0	35.00	72.0	35.00	71.0	35.00	--	--	--	--	
A-10											
Good	--	--	--	--	70.5	33.00	--	--	--	--	
A-11											
Choice	72.6	33.50	72.0	33.50	--	--	--	--	--	--	
Route											
Good	71.0	33.50	73.5	33.50	--	--	--	--	--	--	
Choice	72.0	33.50	71.0	35.00	--	--	--	--	--	--	
Average											
Good	73.0	33.17	72.9	33.50	70.7	32.95	70.4	32.54	70.0	32.50	
Choice	72.2	33.80	70.2	34.31	70.1	33.43	69.2	33.48	68.3	33.44	
Prime	70.5	34.00	68.1	34.00	68.2	34.00	68.3	34.00	--	--	
Range											
Good	71.0- 74.0	32.50- 33.50	72.8- 73.5	33.50	70.0- 71.0	32.25- 33.50	70.4- 70.5	32.50- 32.75	70.0	32.50	
Choice	71.0- 72.6	33.50- 35.00	67.9- 72.0	33.50- 35.00	68.2- 71.2	33.00- 35.00	66.7- 71.5	33.00- 35.00	68.1- 70.0	33.00- 33.50	
Prime	70.5	34.00	68.1	34.00	68.2	34.00	68.3	34.00	--	--	

TABLE VIII--AVERAGE ESTIMATED RETAIL YIELD AND AVERAGE WHOLESALE
PRICE BY PURCHASER, WEIGHT AND GRADE; PLANT B

Sides and Carcasses Only										
Purchaser and Grade	500# and Below		500-600		600-700		700-800		800 and Above	
	Avg. R. Y.	Avg. P.	Avg. R. Y.	Avg. P.	Avg. R. Y.	Avg. P.	Avg. R. Y.	Avg. P.	Avg. R. Y.	Avg. P.
	(%)	(\$)	(%)	(\$)	(%)	(\$)	(%)	(\$)	(%)	(\$)
Break										
Good	73.0	38.54	73.4	38.46	70.5	38.62	69.6	38.65	69.3	38.84
Choice	71.8	38.41	72.8	38.65	70.3	38.74	69.2	38.81	64.4	38.86
Prime	--	--	--	--	65.5	38.36	--	--	--	--
B-1										
Good	73.0	37.50	72.3	37.50	--	--	--	--	--	--
Choice	72.5	39.50	--	--	71.0	39.50	--	--	--	--
B-2										
Choice	--	--	--	--	69.5	39.50	70.0	39.50	--	--
B-3										
Choice	--	--	73.5	38.36	71.8	38.36	--	--	--	--
B-4										
Good	--	--	--	--	--	--	67.3	37.95	68.0	37.95
Choice	--	--	--	--	68.6	37.95	68.8	37.95	68.0	37.95
B-5										
Good	--	--	71.0	37.70	--	--	70.3	37.70	68.7	37.70
Choice	--	--	68.0	39.50	--	--	69.8	39.50	68.6	39.50
Prime	--	--	--	--	--	--	64.0	40.20	--	--
B-6										
Good	--	--	--	--	--	--	67.5	37.95	--	--
Choice	--	--	--	--	--	--	68.7	37.97	69.5	37.95
B-7										
Good	--	--	71.0	37.00	--	--	--	--	--	--
Choice	71.8	40.00	71.8	40.00	70.7	40.00	--	--	--	--

TABLE VIII (Continued)

Sides and Carcasses Only											
Purchaser and Grade	500# and Below		500-600		600-700		700-800		800 and Above		
	Avg. R. Y.	Avg. P.	Avg. R. Y.	Avg. P.	Avg. R. Y.	Avg. P.	Avg. R. Y.	Avg. P.	Avg. R. Y.	Avg. P.	
	(%)	(\$)	(%)	(\$)	(%)	(\$)	(%)	(\$)	(%)	(\$)	
B-8											
Good	--	--	74.8	36.75	71.5	36.75	--	--	--	--	
B-9											
Good	--	--	72.1	39.00	71.0	39.00	69.0	40.00	--	--	
Choice	72.5	40.00	72.0	40.00	70.0	40.00	73.0	40.50	--	--	
B-10											
Choice	--	--	--	--	70.3	38.16	70.0	38.16	--	--	
B-11											
Choice	73.5	40.50	72.0	40.50	71.0	40.50	--	--	--	--	
B-12											
Good	--	--	70.0	38.50	70.0	38.50	69.0	38.50	--	--	
B-13											
Good	--	--	--	--	73.5	41.00	73.0	41.00	--	--	
Choice	--	--	73.0	41.00	70.0	41.00	--	--	--	--	
B-14											
Good	74.0	36.50	72.4	37.40	71.0	39.00	--	--	--	--	
Choice	72.3	38.79	73.4	39.20	70.0	39.33	--	--	68.0	38.00	
Prime	--	--	70.0	42.00	--	--	--	--	--	--	
Average											
Good	73.2	37.92	72.8	38.11	70.8	38.70	69.6	38.41	68.9	38.22	
Choice	72.3	39.34	72.5	39.17	70.3	38.76	69.1	38.44	67.0	38.99	
Prime	--	--	70.0	42.00	65.5	38.36	64.0	40.20	--	--	
Range											
Good	73.0-	36.50-	70.0-	37.00-	70.0-	36.75-	67.3-	37.70-	68.0-	37.70-	
	74.0	38.54	74.8	38.50	73.5	41.00	73.0	41.00	69.3	38.84	

TABLE VIII (Continued)

Sides and Carcasses Only										
Purchaser and Grade	500# and Below		500-600		600-700		700-800		800 and Above	
	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.
	R. Y. (%)	P. (\$)	R. Y. (%)	P. (\$)	R. Y. (%)	P. (\$)	R. Y. (%)	P. (\$)	R. Y. (%)	P. (\$)
Choice	71.8-	38.41-	68.0-	38.36-	68.6-	37.95-	68.1-	37.95-	64.4-	37.95-
	73.5	40.50	73.5	41.00	71.8	41.00	73.0	41.50	69.5	39.50
Prime	--	--	70.0	42.00	65.5	38.36	64.0	40.20	--	--

TABLE IX--AVERAGE ESTIMATED RETAIL YIELD AND AVERAGE WHOLESALE
PRICE BY PURCHASER, WEIGHT AND GRADE; PLANT C

Sides and Carcasses Only										
Purchaser and Grade	500# and Below		500-600		600-700		700-800		800 and Above	
	Avg. R. Y. (%)	Avg. P. (\$)								
Break										
Good	--	--	73.4	37.07	73.0	36.50	--	--	--	--
Choice	--	--	71.5	37.81	69.7	38.47	68.7	39.17	69.0	38.88
Prime	73.0	38.00	--	--	67.8	40.00	67.2	40.30	--	--
C-1										
Good	75.2	34.00	--	--	--	--	--	--	--	--
Choice	74.0	34.75	69.0	38.00	--	--	--	--	--	--
C-2										
Choice	--	--	71.3	38.50	69.0	38.50	68.3	39.50	--	--
Prime	--	--	--	--	69.0	39.50	--	--	--	--
C-3										
Good	--	--	74.8	33.00	74.5	33.00	75.0	33.00	--	--
Choice	--	--	70.0	38.00	68.5	38.00	69.0	39.00	--	--
C-4										
Choice	--	--	--	--	--	--	67.8	39.50	66.5	40.00
Prime	--	--	--	--	--	--	68.0	41.00	65.0	41.00
C-5										
Choice	--	--	--	--	--	--	70.0	39.50	68.0	40.00
C-6										
Choice	--	--	68.0	38.50	69.7	38.50	68.5	38.50	--	--
Prime	--	--	--	--	67.0	39.50	--	--	--	--
C-7										
Choice	--	--	71.0	38.50	70.0	39.00	71.0	39.00	--	--

TABLE IX (Continued)

Sides and Carcasses Only										
Purchaser and Grade	500# and Below		500-600		600-700		700-800		800 and Above	
	Avg. R. Y. (%)	Avg. P. (\$)								
C-8										
Choice	--	--	--	--	--	--	68.0	39.50	68.5	40.00
C-9										
Good	75.5	38.00	77.0	38.00	--	--	--	--	--	--
Choice	70.0	38.50	70.5	38.50	68.0	38.50	--	--	--	--
Prime	--	--	68.0	38.50	--	--	--	--	--	--
C-10										
Choice	--	--	73.5	38.00	69.4	38.50	70.5	39.00	--	--
C-11										
Choice	--	--	--	--	69.1	38.50	68.5	39.00	--	--
C-12										
Choice	--	--	--	--	68.0	38.50	68.7	39.50	--	--
Prime	--	--	--	--	69.0	38.50	--	--	--	--
C-13										
Choice	--	--	--	--	70.2	38.50	69.8	39.00	--	--
C-14										
Good	75.0	37.00	--	--	--	--	--	--	--	--
Choice	72.0	37.00	72.1	37.00	71.7	37.00	--	--	--	--
C-15										
Good	--	--	72.6	36.00	--	--	--	--	--	--
Choice	73.0	39.00	72.9	38.86	72.0	39.00	--	--	--	--
Prime	--	--	74.0	39.00	72.0	39.00	--	--	--	--
C-16										
Choice	--	--	--	--	70.8	38.50	69.7	39.00	--	--
Prime	75.00	39.00	70.0	39.90	70.0	39.75	68.0	41.00	--	--

TABLE IX (Continued)

Sides and Carcasses Only										
Purchaser and Grade	500# and Below		500-600		600-700		700-800		800 and Above	
	Avg. R. Y.	Avg. P.	Avg. R. Y.	Avg. P.	Avg. R. Y.	Avg. P.	Avg. R. Y.	Avg. P.	Avg. R. Y.	Avg. P.
	(%)	(\$)	(%)	(\$)	(%)	(\$)	(%)	(\$)	(%)	(\$)
C-17										
Choice	--	--	--	--	70.7	39.00	--	--	--	--
Prime	--	--	--	--	70.5	40.00	69.0	40.50	--	--
C-18										
Good	75.0	38.50	--	--	--	--	--	--	--	--
Choice	72.1	37.36	71.9	37.57	71.5	38.20	71.0	38.50	--	--
Prime	70.0	38.50	69.0	38.50	--	--	67.0	39.00	--	--
C-19										
Good	--	--	71.2	34.50	--	--	--	--	--	--
Choice	--	--	74.5	38.00	--	--	--	--	--	--
Prime	--	--	--	--	--	--	--	--	64.5	41.00

Choice grades and received generally low yielding Good grade carcasses and slightly below average to above average yielding carcasses of Choice grade.

The purchases of these four retail purchasers illustrate the tendency for the price-retail yield relationship to vary from negative to positive depending upon purchaser, grade and plant. A close examination of Tables VII, VIII, , and IX shows similar relationships for the other purchasers. What relationship exists for Break purchases at the different plants? They offer some interesting observations also (obtained from the Tables referred to above) which will be discussed in the following paragraph.

A tendency for Break to get the low yielding carcasses is very noticeable at Plant A (Table VII) where Break had the lowest retail yield average in the 5/6 and 6/7 weight groupings. This tendency is not so noticeable at the other two plants; however, Break generally receives lower than average retail yield averages. Plant C had the largest range, on the average, of prices and retail yield. It included a larger sample and the sample covered the grade and yield range more thoroughly than the smaller samples from the other two plants.

Statistical Analysis of Retail Yield Differences

The previous three tables have indicated there are some differences in estimated retail yield averages among retail purchasers. To maximize the value of these computations, only those purchasing six or more carcasses or sides of a particular grade and weight were included in the analysis. Analysis of retail yield was carried out by purchaser for the grades and weights listed in Table X. Analysis of variance was used to determine whether there were significant differences between mean retail yields of purchasers. A null hypothesis (no difference between purchaser means) was tested for each of the six plants, weight and grade classifications listed in Table X. If a null hypothesis was rejected it indicated that there were significant differences in individual purchasers average retail yields at the specific plant for the weight and grade tested. Listed below are the critical and computed F ratios used in testing the hypothesis. The null hypothesis for Plant A, Choice grade, 600-700 lbs. was $\mu_{BK} = \mu_{A-2} = \mu_{A-3} = \mu_{A-4} = \mu_{A-5} = \mu_{A-6} = \mu_{A-7} = \mu_{A-8}$. Calculations with the single variable classification method brought the following results:

- (1) Plant A Choice 600-700 lbs.
 $\frac{S^2_M}{S^2_P} = 2.923$ $F_{(.01)}(7, 99) = 2.82$ $2.923 > 2.82$
 Reject hypothesis significant
- (2) Plant B Choice 600-700 lbs.
 $\frac{S^2_M}{S^2_P} = 5.437$ $F_{(.01)}(5, 97) = 3.25$ $5.437 > 3.25$
 Reject hypothesis significant
- (3) Plant C Choice 600-700 lbs.
 $\frac{S^2_M}{S^2_P} = 3.015$ $F_{(.05)}(6, 81) = 2.227$ $3.015 > 2.227$
 Reject hypothesis significant
- (4) Plant B Choice 700-800 lbs.
 $\frac{S^2_M}{S^2_P} = .9837$ $F_{(.05)}(3, 78) = 2.74$ $.9837 > 2.74$
 Fail to reject hypothesis Not significant
- (5) Plant C Choice 500-600 lbs.
 $\frac{S^2_M}{S^2_P} = .6205$ $F_{(.05)}(6, 75) = 2.22$ $.6205 > 2.22$
 Fail to reject hypothesis Not significant
- (6) Plant C Choice 700-800 lbs.
 $\frac{S^2_M}{S^2_P} = 2.5666$ $F_{(.05)}(5, 48) = 2.42$ $2.5666 > 2.42$
 Reject hypothesis significant

These analyses reveal that there were statistically significant differences in mean retail yields among purchasers buying Choice 600-700 weight carcasses and sides from all three plants. Of the three other weight and grade groups whose means were studied through analysis of variance, only Choice 700-800 pounds at Plant C was significant. Insufficient sample sizes were available in the other grade and weight groups for the analysis of variance to be meaningful.

TABLE X -- AVERAGE RETAIL YIELD AND NUMBER OF CARCASSES BY PURCHASER, WEIGHT, GRADE AND PLANT

Purchaser	Number of Carcasses	Percent Mean Yield	Purchaser	Number of Carcasses	Percent Mean Yield
1-Plant A Choice 6/7			4-Plant B Choice 7/8		
Break	12	68.17	Break	17	69.23
A-2	12	70.75	B-4	23	68.83
A-3	16	70.40	B-5	13	69.80
A-4	14	69.57	B-6	29	68.70
A-5	16	70.31	5-Plant C Choice 5/6		
A-6	10	70.10	Break	13	71.54
A-7	10	69.20	C-14	13	72.10
A-8	12	71.00	C-15	7	72.86
2-Plant B Choice 6/7			C-18	7	72.14
Break	36	70.30	C-20	30	71.87
B-2	8	69.50	C-22	6	72.67
B-3	20	71.80	C-26	6	71.83
B-4	15	68.60	6-Plant C Choice 7/8		
B-7	10	70.70	Break	9	68.67
B-10	14	70.30	C-2	15	68.33
3-Plant C Choice 6/7			C-4	12	67.75
Break	17	69.70	C-7	6	70.83
C-13	9	70.20	C-11	6	68.50
C-14	6	71.70	C-12	6	68.67
C-15	7	71.90			
C-16	8	70.75			
C-18	33	71.55			
C-20	8	71.90			

Carcass Value Comparisons Among Retail Purchasers

The statistical analysis also suggests that since certain purchasers are realizing a higher estimated retail yield, they also realize a higher value of carcass and sides. One might add that the reverse is also true. A similar analysis as accomplished in Tables I, II and III for lot data was carried out to measure value differences.

To arrive at some measure of the variation among purchasers between the prices they pay and the retail value of the carcasses and sides they purchase, the analyses in Tables XI, XII and XIII were made. These tables show by purchaser, grade and plant the deviations of each purchaser's mean difference in retail carcass value for all purchasers of that grade and plant. All irregular carcasses have again been omitted to prevent the biased result their inclusion would insure. The three tables are interpreted in the following way by columns:

1. Column 1 is the average estimated retail yield of all carcasses and sides purchased by the retailer of the grade and from the plant indicated on each table.
2. Column 2 is the average purchase price paid by grade by the retailer at the plant indicated.
3. Column 3 is the average shipping weight by grade and purchaser obtained by correcting average hot weight by an assumed 3 percent shrinkage loss.
4. Column 4 is the average weight in retail cuts of the carcass obtained by multiplying Column 1 by Column 3, again by purchaser and grade.
5. Column 5 is the average composite carcass prices by grade (also used in Tables I, II and III).
6. Column 6 is the average value in retail cuts derived from 100 pounds of carcass or side. This value derived from dividing the retail value of an average carcass or side (Column 4 times Column 5) by the average shipping weight (Column 3) times 100, again by purchaser and grade.
7. Column 7 is the difference (by purchaser and grade) between price paid by the retailer (Column 2) and the value of retail cuts (Column 6) per 100 pounds carcass weight.
8. Column 8 is the grand mean difference ("spread") in price paid and retail value of carcass per cwt. for all purchasers listed (separate grand mean for each grade). These means were obtained by grade by summing Column 7 and dividing by the number of purchasers.
9. Column 9 is the deviations of the purchaser mean differences from the grand mean differences by grade. (Columns 7-8.)

TABLE XI--CALCULATED WHOLESALE TO RETAIL SPREAD BY PURCHASER AND DEVIATIONS
OF THESE INDIVIDUAL PURCHASER SPREADS FROM THE MEAN SPREAD OF ALL PURCHASERS BY GRADE; PLANT A

Purchaser & Grade	1	2	3	4	5	6	7	8	9
	Avg. Retail Yield (%)	Avg. Price Paid (\$)	Avg. Shipping Weight (lbs.)	Pounds Retail Cuts per Carcass (lbs.)	Retail Price per Pound (\$)	Retail Value per 100 lbs. Carcass (\$)	Calculated Spread per Cwt. (\$)	Plant Mean Spread (\$)	Deviations (\$)
Break									
Gd	70.9	32.50	701	497	.7343	52.06	19.56	19.38	+ .18
Ch	68.6	33.50	675	463	.7423	50.92	17.42	18.71	-1.29
Pr	68.6	34.00	596	409	.7829	53.73	19.73	19.73	- 0 -
A-1									
Ch	71.5	34.50	608	435	.7423	53.11	18.61	18.71	- .10
A-2									
Ch	70.7	33.50	637	450	.7423	52.44	18.94	18.71	+ .23
A-3									
Ch	70.2	33.00	661	464	.7423	52.11	19.11	18.71	+ .40
A-4									
Ch	69.5	33.00	660	459	.7423	51.62	18.62	18.71	- .09
A-5									
Gd	71.0	32.25	612	435	.7343	52.19	19.94	19.38	+ .56
Ch	70.4	33.00	647	454	.7423	52.23	19.23	18.71	+ .52
A-6									
Gd	70.8	32.75	664	470	.7343	51.98	19.23	19.38	- .15
Ch	70.2	33.00	647	454	.7423	52.09	19.09	18.71	+ .38
A-7									
Ch	69.0	33.00	661	456	.7423	51.21	18.21	18.71	- .50
A-8									
Gd	71.0	33.50	652	463	.7343	52.14	18.64	19.38	- .74
Ch	71.1	35.00	610	434	.7423	52.81	17.81	18.71	- .90

TABLE XI (Continued)

	1	2	3	4	5	6	7	8	9
Purchaser & Grade	Avg. Retail Yield (%)	Avg. Price Paid (\$)	Avg. Shipping Weight (lbs.)	Pounds Retail Cuts per Carcass (lbs.)	Retail Price per Pound (\$)	Retail Value per 100 lbs. Carcass (\$)	Calculated Spread per Cwt. (\$)	Plant Mean Spread (\$)	Deviations (\$)
A-9									
Gd	72.8	33.50	503	366	.7343	53.43	19.93	19.38	+ .55
Ch	71.8	35.00	538	386	.7423	53.26	18.26	18.71	- .45
A-10									
Gd	70.5	33.00	636	448	.7343	51.72	18.72	19.38	- .66
A-11									
Ch	72.5	33.50	462	335	.7423	53.82	20.32	18.71	+1.61
A-12									
Gd	72.3	33.50	471	341	.7343	53.16	19.66	19.38	+ .26
Ch	71.5	34.25	514	368	.7423	53.15	18.90	18.71	+ .19

TABLE XII--CALCULATED WHOLESALE TO RETAIL SPREAD BY PURCHASER AND DEVIATIONS
OF THESE INDIVIDUAL SPREADS FROM THE MEAN SPREAD OF ALL PURCHASERS BY GRADE; PLANT B

Purchaser & Grade	1	2	3	4	5	6	7	8	9
	Avg. Retail Yield (%)	Avg. Price Paid (\$)	Avg. Shipping Weight (lbs.)	Pounds Retail Cuts per Carcass (lbs.)	Retail Price per Pound (\$)	Retail Value per 100 lbs. Carcass (\$)	Calculated Spread per Cwt. (\$)	Plant Mean Spread (\$)	Deviations (\$)
Break									
Gd	70.9	38.60	641	454	.7901	55.96	17.36	17.86	-.50
Ch	69.8	38.73	655	457	.7981	55.68	16.95	17.21	-.26
Pr	65.5	38.86	606	397	.8387	54.94	16.08	15.40	+.68
B-1									
Gd	72.5	37.50	509	369	.7901	57.28	19.78	17.86	+1.92
Ch	72.2	39.50	479	346	.7981	57.65	18.15	17.21	+.94
B-2									
Ch	69.6	39.50	649	452	.7981	55.58	16.08	17.21	-1.13
B-3									
Ch	71.9	38.36	620	446	.7981	57.41	19.05	17.21	+1.84
B-4									
Gd	67.5	37.95	737	497	.7901	53.28	15.33	17.86	-2.53
Ch	68.6	37.95	700	480	.7981	54.73	16.78	17.21	-.43
B-5									
Gd	70.0	37.70	738	517	.7901	55.35	17.65	17.86	-.21
Ch	69.0	39.50	774	534	.7981	55.06	15.56	17.21	-1.65
Pr	64.0	40.20	755	483	.8387	53.65	13.45	15.40	-1.95
B-6									
Gd	67.5	37.95	746	504	.7901	53.38	15.43	17.86	-2.43
Ch	68.8	37.96	724	498	.7981	54.90	16.94	17.21	-.27

TABLE XII (Continued)

	1	2	3	4	5	6	7	8	9
Purchaser & Grade	Avg. Retail Yield (%)	Avg. Price Paid (\$)	Avg. Shipping Weight (lbs.)	Pounds Retail Cuts per Carcass (lbs.)	Retail Price per Pound (\$)	Retail Value per 100 lbs. Carcass (\$)	Calculated Spread per Cwt. (\$)	Plant Mean Spread (\$)	Deviations (\$)
B-7									
Gd	71.0	37.00	508	361	.7901	56.14	19.14	17.86	+1.28
Ch	71.5	40.00	544	389	.7981	57.07	17.07	17.21	-.14
B-8									
Gd	73.7	36.75	582	429	.7901	58.24	21.49	17.86	+3.63
B-9									
Gd	71.6	39.09	581	416	.7901	56.57	17.48	17.86	-.38
Ch	72.2	40.06	511	369	.7981	57.63	17.57	17.21	+.36
B-10									
Ch	70.3	38.16	644	453	.7981	56.14	17.98	17.21	+.78
B-11									
Ch	72.5	40.50	518	376	.7981	57.93	17.43	17.21	+.22
B-12									
Gd	69.8	38.50	627	438	.7901	55.19	16.69	17.86	-1.17
B-13									
Gd	73.3	41.00	660	484	.7901	57.94	16.94	17.86	-.92
Ch	71.0	41.00	623	422	.7981	56.62	15.62	17.21	-1.59
B-14									
Gd	72.1	37.83	548	395	.7901	56.95	19.12	17.86	+1.26
Ch	72.0	38.92	512	369	.7981	57.52	18.60	17.21	+1.39
Pr	70.0	42.00	526	368	.8387	58.68	16.68	15.40	+1.28

TABLE XIII--CALCULATED WHOLESALE TO RETAIL SPREAD BY PURCHASER AND DEVIATIONS OF THESE INDIVIDUAL PURCHASER SPREADS FROM THE MEAN SPREAD OF ALL PURCHASERS BY GRADE; PLANT C

	1	2	3	4	5	6	7	8	9
Purchaser & Grade	Avg. Retail Yield (%)	Avg. Price Paid (\$)	Avg. Shipping Weight (lbs.)	Pounds Retail Cuts per Carcass (lbs.)	Retail Price per Pound (\$)	Retail Value per 100 lbs. Carcass (\$)	Calculated Spread per Cwt. (\$)	Plant Mean Spread (\$)	Deviations (\$)
Break									
Gd	73.4	37.00	533	391	.8100	59.42	22.42	22.93	-.51
Ch	70.0	38.45	644	451	.8180	57.28	18.83	19.20	-.37
Pr	68.0	39.95	662	450	.8586	58.36	18.41	19.69	-1.28
C-1									
Gd	75.2	34.00	388	292	.8100	60.96	26.96	22.93	+4.03
Ch	72.3	35.83	413	299	.8180	59.22	23.40	19.20	+4.20
C-2									
Ch	68.8	39.29	697	480	.8180	56.33	17.04	19.20	-2.16
Pr	69.0	39.50	643	444	.8586	59.29	19.79	19.69	+.10
C-3									
Gd	74.7	33.00	581	434	.8100	60.51	27.51	22.93	+4.58
Ch	69.0	38.25	643	444	.8180	56.48	18.23	19.20	-.97
C-4									
Ch	67.4	39.65	752	507	.8180	55.15	15.50	19.20	-3.70
Pr	66.5	41.00	742	493	.8586	57.05	16.05	19.69	-3.64
C-5									
Ch	69.4	39.64	747	518	.8180	56.72	17.08	19.20	-2.12
C-6									
Ch	68.8	38.50	641	441	.8180	56.28	17.78	19.20	-1.42
Pr	67.0	39.50	622	417	.8586	57.56	18.06	19.69	-1.63
C-7									
Ch	70.8	38.94	687	486	.8180	57.87	18.93	19.20	-.27

TABLE XIII (Continued)

		1	2	3	4	5	6	7	8	9
Purchaser & Grade		Avg. Retail Yield (%)	Avg. Price Paid (\$)	Avg. Shipping Weight (lbs.)	Pounds Retail Cuts per Carcass (lbs.)	Retail Price per Pound (\$)	Retail Value per 100 lbs. Carcass (\$)	Calculated Spread per Cwt. (\$)	Plant Mean Spread (\$)	Deviations (\$)
C-8	Ch	68.2	39.67	773	527	.8180	55.77	16.10	19.20	-3.10
C-10	Ch	70.1	38.50	615	431	.8180	57.33	18.83	19.20	- .37
C-9	Gd	76.0	38.00	470	357	.8100	61.53	23.53	22.93	+ .60
	Ch	69.8	38.50	504	352	.8180	57.13	18.63	19.20	- .57
	Pr	68.0	38.50	493	335	.8586	58.34	19.84	19.69	+ .15
C-11	Ch	68.8	38.73	665	458	.8180	56.34	17.61	19.20	-1.59
C-12	Ch	68.6	39.36	710	487	.8180	56.11	16.75	19.20	-2.45
	Pr	69.0	38.50	638	440	.8586	59.21	20.71	19.69	+1.02
C-13	Ch	70.1	38.65	659	462	.8180	57.35	18.70	19.20	- .50
C-14	Gd	75.0	37.00	483	362	.8100	60.71	23.71	22.93	+ .78
	Ch	72.0	37.00	564	406	.8180	58.88	21.88	19.20	+2.68
C-15	Gd	72.6	36.00	518	376	.8100	58.88	22.80	22.93	- .13
	Ch	72.4	38.93	557	403	.8180	59.18	20.25	19.20	+1.05
	Pr	73.0	39.00	568	415	.8586	62.73	23.73	18.69	+4.04
C-16	Ch	70.5	38.64	657	463	.8180	57.65	19.01	19.20	- .19
	Pr	69.6	40.17	630	438	.8586	59.69	19.52	19.69	- .03

TABLE XIII (Continued)

Purchaser & Grade	1	2	3	4	5	6	7	8	9
	Avg. Retail Yield (%)	Avg. Price Paid (\$)	Avg. Shipping Weight (lbs.)	Pounds Retail Cuts per Carcass (lbs.)	Retail Price per Pound (\$)	Retail Value per 100 lbs. Carcass (\$)	Calculated Spread per Cwt. (\$)	Plant Mean Spread (\$)	Deviations (\$)
C-17									
Ch	70.7	39.00	653	462	.8180	57.87	18.87	19.20	-.33
Pr	70.0	40.16	659	461	.8586	60.06	19.90	19.69	+.21
C-18									
Gd	75.0	38.50	483	348	.8100	58.36	19.86	22.93	-3.07
Ch	71.7	37.83	565	405	.8180	58.64	20.81	19.20	+1.61
Pr	68.7	38.67	559	384	.8586	58.98	20.31	19.69	+.62
C-19									
Gd	71.2	34.50	545	388	.8100	57.67	23.17	22.93	+.24
Ch	74.5	38.00	568	423	.8180	60.92	22.92	19.20	+3.72
Pr	64.5	41.00	825	532	.8586	55.37	14.37	19.69	-5.32
C-20									
Gd	71.0	36.00	546	388	.8100	57.56	21.56	22.93	-1.37
Ch	72.1	38.50	576	415	.8180	58.94	20.44	19.20	+1.24
Pr	72.0	39.00	517	372	.8586	61.78	22.78	19.69	+3.09
C-21									
Ch	71.8	39.50	578	415	.8180	58.73	19.23	19.20	+.03
Pr	71.8	39.58	617	443	.8586	61.65	22.07	19.69	+2.38
C-22									
Gd	72.7	37.50	538	391	.8100	58.87	21.37	22.93	-1.56
Ch	72.7	37.50	558	406	.8180	59.52	22.02	19.20	+2.82
C-23									
Ch	71.2	38.50	634	451	.8180	58.19	19.69	19.20	+.49

TABLE XIII (Continued)

	1	2	3	4	5	6	7	8	9
Purchaser & Grade	Avg. Retail Yield (%)	Avg. Price Paid (\$)	Avg. Shipping Weight (lbs.)	Pounds Retail Cuts per Carcass (lbs.)	Retail Price per Pound (\$)	Retail Value per 100 lbs. Carcass (\$)	Calculated Spread per Cwt. (\$)	Plant Mean Spread (\$)	Deviations (\$)
C-24									
Gd	72.0	38.00	495	356	.8100	58.25	20.25	22.93	-2.68
Ch	71.3	38.00	555	396	.8180	58.37	20.37	19.20	+1.17
C-25									
Ch	69.3	37.50	554	384	.8180	56.70	19.20	19.20	- 0 -
C-26									
Gd	72.4	34.41	627	454	.8100	58.65	24.24	22.93	+1.31
Ch	70.3	37.28	603	424	.8180	57.52	20.24	19.20	+1.04
Pr	70.0	40.00	634	444	.8586	60.13	20.13	19.69	+4.44
C-27									
Gd	71.9	37.50	600	431	.8100	58.19	20.69	22.93	-2.24

Grade is controlled within these tables while retail yield is permitted to vary. Price differentials for weight variation are reflected in the average purchase price and therefore in the tables.

Plant A (derived from Table XI) has a "calculated spread" range of \$2.90 per cwt. carcass. The average purchaser with a plus deviation had a \$1.08 per cwt. carcass wider "spread" than the average purchaser with a minus deviation. These same measurements for Plant B (from Table XII) are \$8.04, and \$2.07 per cwt. carcass, respectively; for Plant C (Table XIII) they are \$13.14 and \$3.27 per cwt. carcass, respectively.

The tables all indicate a substantial deviation of the individual purchase means from the grand mean difference ("spread") especially Table XIII (Plant C). A positive deviation in Column 9 indicates that the purchaser received a higher value carcass and/or paid less than average purchaser paid. A negative deviation indicates the purchaser received a lower value carcass and/or paid more than the average purchaser. If the assumption is made that the grand mean difference indicates pricing accuracy (a reasonable wholesale to retail spread) the purchasers having positive deviations should have paid more and those having negative deviations should have paid less. The actual amount is indicated by the size of the deviation.²³ If the average mean difference is not a good estimate of a reasonable wholesale to retail spread, and if one can be determined, it can be substituted into the tables and a similar analysis made.

Figure 11 indicates graphically the relationship between the wholesale to retail spread (retail value of carcass per cwt. minus price paid by purchaser per cwt.) and estimated retail yield. It shows this relationship at Plant B for both Good and Choice carcasses and sides. A positive relationship is obvious, meaning the spread increased with retail yield. The two observations encircled are the mean differences for Good and Choice of a single purchaser who paid an unusually high price for the few carcasses he purchased at Plant B. Without these two observations the effect is indeed striking. A relationship similar to the one shown for Plant B by Figure 11 also exists for Plants A and C but is not shown. No separate analysis was made for fores and hinds as the earlier evidence indicated their price-retail yield relationship was similar to that of carcasses and sides.

VALUE DIFFERENCES DUE TO VARIATION IN RETAIL YIELD

A second objective of this study is to evaluate the change in carcass value brought about by a varying retail yield percentage. The data collected at the plants indicated that there is a substantial variation in retail yield among carcasses of different grades as well as between grades. The previous section indicated that the retail yield variable as a measure of carcass value has not been fully recognized or used by the trade. Since the retailer apparently realizes a bonus from the higher

²³Same assumptions must be made as were made for the similar analysis by lot (refer to footnote 21).

yielding carcasses within a grade, it might be useful to evaluate the possible value differences that could exist in the market.

Table XIV shows the possible pounds of retail cuts and the retail value of those cuts which can be derived from various weight carcasses of varying percentage of retail yield. This table assumes a retail composite carcass value of \$0.80 per retail pound. The influence of increasing retail yield on value of carcass (with weight constant) is substantial. The combination of retail yield and carcass weight in the table give both pounds of retail cuts and retail value of these pounds. The difference between any two of these combinations shows the weight and value differentials due to change in retail yield and weight. For example, the difference in value between a 600 pound carcass yielding 65 percent retail cuts and a 600 pound carcass yielding 76 percent retail cuts is \$52.80 (obtained from Table XIV). Other comparisons of various weight carcasses with less difference in retail yield percentage can be made from the table and each shows the potential of retail yield as a measure of carcass value.

Table XV shows the retail value per cwt. carcass at several retail composite

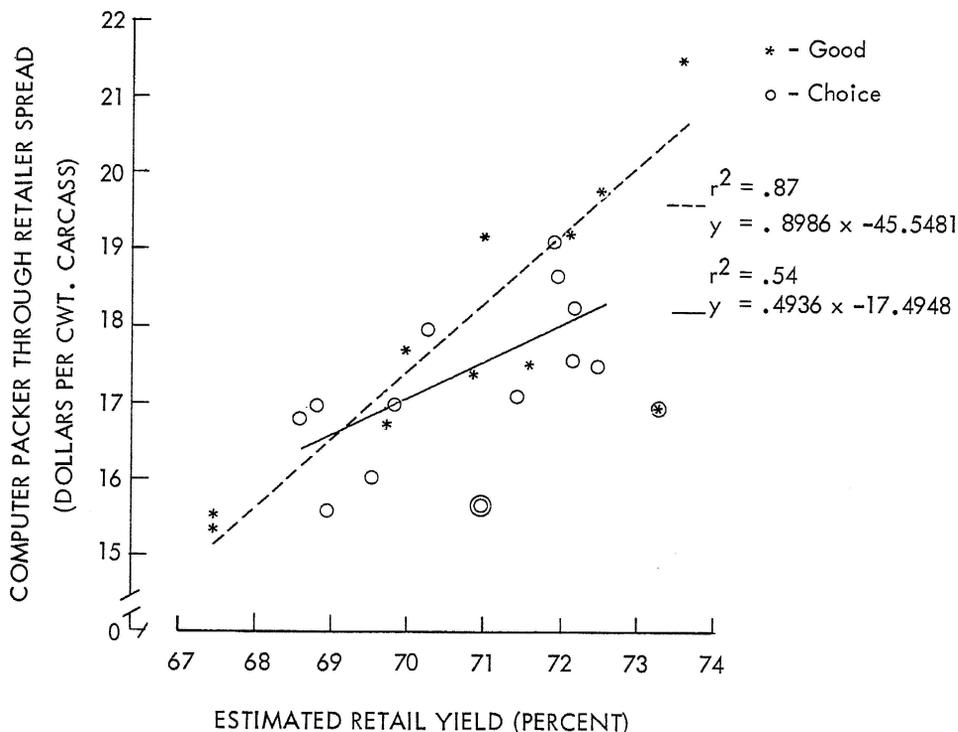


Fig. 11—Relationship between estimated retail yield and calculated wholesale to retail spread by purchaser Choice and Good grade; Plant B.

TABLE XIV--POUNDS OF RETAIL CUTS FROM VARIOUS WEIGHT CARCASSES AT VARIOUS RETAIL YIELDS AND VALUE OF THESE POUNDS OF RETAIL CUTS ASSUMING COMPOSITE CARCASS PRICE OF .80 PER RETAIL POUND RETAIL YIELD (Percent)

	65	66	67	68	69	70	71	72	73	74	75	76
350	227.5 182.00	231.0 184.80	234.5 187.60	238.0 190.40	241.5 193.20	245.0 196.00	248.5 198.80	252.0 201.60	255.5 204.40	259.0 207.20	262.5 210.00	266.0 212.80
400	260 208.00	264 211.20	268 214.40	272 217.60	276 220.80	280 224.00	284 227.20	288 230.40	292 233.60	296 236.80	300 240.00	304 243.20
450	292.5 234.00	297.0 237.60	301.5 241.20	306.0 244.80	310.5 248.40	315.0 252.00	319.5 255.60	334.0 259.20	328.5 262.80	333.0 266.40	337.5 270.00	342.0 273.60
500	325 260.00	330 264.00	335 268.00	340 272.00	345 276.00	350 280.00	355 284.00	360 288.00	365 292.00	370 296.00	375 300.00	380 304.00
550	357.5 286.00	363.0 290.40	368.5 294.80	374.0 299.20	379.5 303.60	385.0 308.00	390.5 312.40	396.0 316.80	401.5 321.20	407.0 325.60	412.5 330.00	418.0 334.40
600	390 312.00	396 316.80	402 321.60	408 326.40	414 331.20	420 336.00	426 340.80	432 345.60	438 350.40	444 355.20	450 360.00	456 364.80
650	422.5 338.00	429.0 343.20	435.5 348.40	442.0 353.60	448.5 358.80	455.0 364.00	461.5 369.20	468.0 374.40	474.5 379.60	481.0 384.80	487.5 390.00	494.0 395.20
700	455.0 364.00	462.0 369.60	469.0 375.20	476.0 380.80	483.0 386.40	490.0 392.00	497.0 397.60	504.0 403.20	511.0 408.80	518.0 414.40	525.0 420.00	532.0 425.60
750	487.5 390.00	495.0 396.00	502.5 402.00	510.0 408.00	517.5 414.00	525.0 420.00	532.5 426.00	540.0 432.00	547.5 438.00	555.0 444.00	562.5 450.00	570.0 456.00
800	520.0 416.00	528.0 422.40	536.0 428.80	544.0 435.20	552.0 441.60	560.0 448.00	568.0 454.40	576.0 460.80	584.0 467.20	592.0 473.60	600.0 480.00	608.0 486.40

Note: Each combination of retail yield and carcass weight has two numbers. The one to the left of the slanted line is the pounds of retail cuts obtainable from that weight and retail yield carcass. The number to the right of the sloping line is the dollar value of these same pounds of retail cuts. The remainder of the carcass is essentially unsalable at retail.

TABLE XV--VALUE/100 POUNDS CARCASS AT VARIOUS RETAIL PRICES/POUND

Retail Composite Carcass Price/Pound	Retail Yield											
	(Percent)											
	65	66	67	68	69	70	71	72	73	74	75	76
	(Dollars)											
.70	45.50	46.20	46.90	47.60	48.30	49.00	49.70	50.40	51.10	51.80	52.50	53.20
.75	48.75	49.50	50.25	51.00	51.75	52.50	53.25	54.00	54.75	55.50	56.25	57.00
.80	52.00	52.80	53.60	54.40	55.20	56.00	56.80	57.60	58.40	59.20	60.00	60.80
.85	55.25	56.10	56.95	57.80	58.65	59.50	60.35	61.20	62.05	62.90	63.75	64.60
.90	58.50	59.40	60.30	61.20	62.10	63.00	63.90	64.80	65.70	66.60	67.50	68.40
.95	61.75	62.70	63.65	64.60	65.55	66.50	67.45	68.40	69.35	70.30	71.25	72.20
1.00	65.00	66.00	67.00	68.00	69.00	70.00	71.00	72.00	73.00	74.00	75.00	76.00

carcass prices per pound. It shows the variation in value that results from increasing or decreasing the retail yield percentage. Every pound salable as retail cuts adds to the value of the carcass as reflected by retail yield percentage. Large value differences are possible by increasing the retail yield of carcasses either naturally by breeding and feeding or through trimming of excess subcutaneous fat.

As an example of how to utilize Table XV, assume the following problem: Two beef carcasses, both Choice grade and nearly identical in weight, are available. One carcass is priced at \$37.00 per cwt. while the other is priced at \$39.00 per cwt. Their estimated retail yields are 67% and 74% respectively. Assuming a retail composite carcass price of \$0.80 per pound, which is the better buy? The \$39.00 per cwt. carcass has a \$5.60 greater value per cwt. ($\$39.00 \times 0.74 = \28.86 ; $\$37.00 \times 0.67 = \24.69 ; $\$28.86 - \$24.69 = \$4.17$) than the \$37.00 per cwt. carcass and its price is only \$2.00 per cwt. greater giving an extra \$3.60 per cwt. return to its purchaser.

Effect of Retail Yield on Transportation Costs

It is evident from the foregoing discussion that retail yield greatly influences the value of a carcass. Retail yield influences value or costs in yet another way and that is through shipping costs. The third objective of the study was to evaluate retail yield influence on shipping costs. Several questions need consideration under this objective. How does the retail yield variable influence shipping costs? What savings are possible to the retailer in shipping costs by buying higher yielding carcasses or through packer trimming of excess fat prior to shipment?

As previously mentioned the retailer is largely concerned with the number of pounds of retail cuts of a certain grade he can cut from a side or quarter of beef. Any portion of the carcass which he cannot turn into a salable product is largely of no value to him. The problem of inedible carcass trimmings at the retail level would be largely solved if all trimming and cutting into retail cuts were accomplished at the packer level. However, this is not the situation as sides and quarters are shipped by the packer to the retailer, not packaged retail cuts. It is this cost of shipping carcass portions that are unsalable as retail cuts (fat, bone, etc.) that is applicable here.

Every pound of unsalable carcass the retailer buys costs the retailer in two ways: The retailer has fewer pounds to sell at retail and he pays shipping costs on the entire carcass. Table XIV showed how much of the carcass weight was realized in retail cuts at various retail yield percentages. The differences between carcass weight and weight of the retail cuts obtainable from it are frequently waste at the retail level. So every pound that this waste is reduced saves the retailer in shipping costs. Table XVI shows the cost of shipping 100 lbs. of retail cuts in sides and quarters at various transportation rates and retail yields. The saving of buying and shipping higher yielding carcasses is large at the higher transportation rates.

TABLE XVI--COST OF SHIPPING 100# OF RETAIL CUTS IN SIDES AND QUARTERS AT VARIOUS TRANSPORTATION RATES AND RETAIL YIELDS

		Retail Yield (Percent)											
		65	66	67	68	69	70	71	72	73	74	75	76
Cost (Dollars) of Shipping 100# Carcass Weight	.50	.77	.76	.75	.74	.73	.72	.71	.70	.69	.68	.67	.66
	.70	1.08	1.06	1.04	1.03	1.01	1.00	.99	.97	.96	.95	.93	.92
	.90	1.38	1.36	1.34	1.32	1.30	1.29	1.27	1.25	1.23	1.22	1.20	1.18
	1.10	1.69	1.67	1.64	1.62	1.59	1.57	1.55	1.53	1.51	1.49	1.48	1.47
	1.30	2.00	1.97	1.94	1.91	1.88	1.86	1.83	1.81	1.78	1.76	1.73	1.71
	1.50	2.31	2.27	2.24	2.21	2.17	2.14	2.11	2.08	2.05	2.03	2.00	1.97
	1.70	2.62	2.58	2.54	2.50	2.46	2.43	2.39	2.36	2.33	2.30	2.27	2.24
	1.90	2.92	2.88	2.84	2.79	2.75	2.71	2.68	2.64	2.60	2.57	2.53	2.50

Tables XVII and XVIII are quick check lists showing the savings per cwt. of shipping a carcass of one retail yield as opposed to shipping another of lower retail yield. Each table includes two transportation rates as one rate reads to the left of the slanted line and the other to the right of the line. Only the four rates are included; however, others can be easily calculated from Table XVI. To find the savings per cwt. of retail cuts at a shipping cost of \$0.70 per cwt. carcass, of shipping a carcass yielding 74% as opposed to another yielding 67%, find 67% on the vertical scale of Table XVII and follow it across the slanted line until it is under the 74% column on the horizontal scale. The figure \$0.11 appears in this square indicating a savings of \$0.11 if shipping 100 lbs. of retail cuts from a carcass yielding 74% as opposed to a carcass yielding 67%. The procedure outlined for \$0.70 shipping rate is simply reversed to find the savings at a \$0.50 shipping rate. Table XVIII is read in the same manner for the rates of \$1.50 and \$1.30.

Not only can the retailer reduce his shipping costs by shipping higher yielding carcasses, but also by requesting the packer to trim some of the excess fat which would be removed at the retail level during cutting.

Effect of Fat Trim by Packer on Transportation Costs

The consumer has become quite "fat" conscious both in the meat she eats and in the effect she believes it has on her physical condition. This has led to the rejection by the consumer of some fatty cuts and much trim by the retailer of cuts prior to packaging or sale. Since it appears uneconomical to have this fat beef at the retail store, it would seem logical for the packer to trim the sides and quarters prior to shipment. The Canadians, according to one source, have practiced the procedure since the 1940's and have found it meets retailer and consumer approval.²⁴

One author, commenting upon the trim suggested by the National Association of Food Chains (NAFC), indicated a trim of 6 percent of carcass weight was possible at the packer level for Choice grade.²⁵ The defatting standard suggested by NAFC is:

- 1) The removal of kidney knob, leaving no more than one inch of fat;
- 2) Removal of all pelvic cavity fat;
- 3) A clean trim of cod or bag fat;
- 4) The removal of all tail vertebrae and a clean trim of tailhead fat.

Another source declared that a reduction of 4.5 percent in carcass weight was possible at the packer level with this standardized fat trim.²⁶ A similar, but not

²⁴ Paul A. Knapp, "Relationship of Beef Retail Yield and Merchandising Techniques," M.S. Thesis, University of Missouri, p. 19, 1964.

²⁵S. T. Shaw, "Merit Selling of Beef," Summary Report, NAFC-AMI Management Clinic on Meat, p. 48, 1963, (cited by Knapp, op. cit., pp. 21-22.).

²⁶Knapp, p. 57.

TABLE XVII--REDUCTIONS IN TRANSPORTATION COSTS BY SHIPPING CARCASSES OF HIGHER RETAIL YIELDS ASSUMING TWO DIFFERENT SHIPPING RATES

		Retail Yield Percentage (Shipping Cost \$0.70 per 100 [#])											
		65	66	67	68	69	70	71	72	73	74	75	76
Retail Yield Percentage (Shipping Cost \$0.50 per 100 [#])	(Dollars)	(Dollars)											
	65		.02	.04	.05	.07	.08	.09	.11	.12	.13	.15	.16
	66	.01		.02	.04	.05	.07	.08	.09	.11	.12	.13	.15
	67	.02	.01		.02	.04	.05	.07	.08	.09	.11	.12	.13
	68	.03	.02	.01		.02	.04	.05	.07	.08	.09	.11	.12
	69	.04	.03	.02	.01		.02	.04	.05	.07	.08	.09	.11
	70	.05	.04	.03	.02	.01		.02	.04	.05	.07	.08	.09
	71	.06	.05	.04	.03	.02	.01		.02	.04	.05	.07	.08
	72	.07	.06	.05	.04	.03	.02	.01		.02	.04	.05	.07
	73	.08	.07	.06	.05	.04	.03	.02	.01		.02	.04	.05
	74	.09	.08	.07	.06	.05	.04	.03	.02	.01		.02	.04
	75	.10	.09	.08	.07	.06	.05	.04	.03	.02	.01		.02
	76	.11	.10	.09	.08	.07	.06	.05	.04	.03	.02	.01	

quite as extensive, fat trim resulted in a 3 to 4 percent reduction in carcass weight at the packer level.²⁷

A correlation coefficient of $-.95$ was found between retail yield and per cent trimmable fat.²⁸ Thus the higher the percent of trimmable fat the lower the cost of shipping it to the retailer.

Table XIX gives the cost of shipping an equivalent of 100 lbs. of carcass after trims of 3, 4.5, and 6% have been made prior to shipment. Again, the higher the shipping rates the more important is the benefit of reducing the unsalable weight prior to shipment. No attempt was made to assess the influence on labor costs of trim at the packer level as opposed to trim at the retail level. This is an interesting avenue for further research.

The fat trimmed by the retailer is, as said before, mainly a wasted by-product of retail cutting. Some retailers are using their best fat trimmings in hamburger made from very lean beef. However, those retailers who do not buy this lean beef do not have this "hamburger market" for fat trimmings obtained from their

²⁷A. R. Ring, "Carcasses, Primal Cuts, 'Saw-Ready Cuts', Defatted and Trimmed Meats," Summary Report NAFC-AMI Management Clinic on Meat, p. 50, 1963, (cited by Knapp, loc. cit, p. 21).

²⁸Knapp, p. 52.

TABLE XVIII--REDUCTIONS IN TRANSPORTATION COSTS BY SHIPPING CARCASSES OF HIGHER RETAIL YIELDS ASSUMING TWO DIFFERENT SHIPPING RATES

		Retail Yield Percentage (Shipping Cost \$1.50 per 100#)											
		65	66	67	68	69	70	71	72	73	74	75	76
Retail Yield Percentage (Shipping Cost \$1.30 per 100#)	(Dollars)												
	65		.04	.07	.10	.14	.17	.20	.23	.26	.28	.31	.34
	66	.03		.04	.07	.10	.14	.17	.20	.23	.26	.28	.31
	67	.06	.03		.04	.07	.10	.14	.17	.20	.23	.26	.28
	68	.09	.06	.03		.04	.07	.10	.14	.17	.20	.23	.26
	69	.12	.09	.06	.03		.04	.07	.10	.14	.17	.20	.23
	70	.14	.12	.09	.06	.03		.04	.07	.10	.14	.17	.20
	71	.17	.14	.12	.09	.06	.03		.04	.07	.10	.14	.17
	72	.19	.17	.14	.12	.09	.06	.03		.04	.07	.10	.14
	73	.22	.19	.17	.14	.12	.09	.06	.03		.04	.07	.10
	74	.24	.22	.19	.17	.14	.12	.09	.06	.03		.04	.07
75	.27	.24	.22	.19	.17	.14	.12	.09	.06	.03		.04	
76	.29	.27	.24	.22	.19	.17	.14	.12	.09	.06	.03		

highly finished carcasses. In some instances, fat trimmed to make the steaks and chops suitable for today's consumer is sufficient in quantity to meet the fat needs of the lean beef retailer (provided the lean beef buyer also purchases Choice domestic beef).

TABLE XIX--COST OF TRANSPORTING 100[#] OF CARCASS AT VARIOUS RATES WITH TRIMS OF 3%, 4.5%, AND 6% AND SAME WITH BYPRODUCT ALLOWANCE (FAT AT 3¢/LB)

Transportation Cost/100 lbs. (Dollars)	I			II		
	Transportation Cost With Trim of			Transportation Cost Minus Byproduct Allowance With Trim of		
	3%	4.5%	6%	3%	4.5%	6%
	(Dollars)			(Dollars)		
.50	.4850	.4775	.4700	.3950	.3415	.2900
.70	.6790	.6685	.6580	.5890	.5335	.4780
.90	.8730	.8595	.8460	.7830	.7245	.6660
1.10	1.0670	1.0505	1.0340	.9770	.9155	.8540
1.30	1.2610	1.2415	1.2220	1.1710	1.1065	1.0420
1.50	1.4550	1.4325	1.4100	1.3650	1.2975	1.2300
1.70	1.6490	1.6235	1.5980	1.5590	1.4885	1.4180
1.90	1.8430	1.8145	1.7860	1.7530	1.6795	1.6060

Should the fat trim be accomplished at the packer level and the retail buyer reimbursed for the value of the fat removed, costs to the retailer would be lowered. The value of this trimmed fat has been set by USDA estimates at \$0.03 per pound (obtained by personal communication from the U.S. Agricultural Marketing Service). If this figure is applied to the amount trimmed in Section I of Table XIX and the resulting product subtracted from the cost of shipping trimmed carcasses, the new shipping costs listed in Section II of the same table are obtained. These latter costs are the costs of shipping the equivalent of 100 pounds of carcass beef after trims of varying percentages have been made and the value of the fat removed has been credited toward reducing the shipping costs.

Packer trimmings and utilization as a packer by-product of the trimmed fat can prove to be a significant improvement in the present beef marketing system. The success enjoyed by the Canadians in this area might easily be duplicated in the United States.