Factors indicating quality in beef have been reviewed by Pearson (36) and hence will not be discussed in detail here.² He has listed color of fat and lean, firmness, tenderness, juiciness, texture, aroma and flavor as factors of importance and has discussed these in relation to such traits as finish, marbling and maturity. Doty (9) reviewed relationships between beef quality and grade and concluded that they were related but emphasized that the relationship was not close, particularly in the lower grades. Although marbling has been reported (36) to be only slightly correlated with juiciness and even less with tenderness, Wheat and Holland (49) found a very high correlation between marbling and carcass grade after ribbing. Carcass grade, whether it be a specified USDA grade or its equivalent, is of great importance to the beef cattle industry since grade and dressing percentage determine the market value of slaughter cattle. Thus, even though its importance may be debatable, marbling currently has a very definite practical value.

The proportion of the beef carcass which is edible is not generally considered as a quality factor. The American consumer demands lean, tender, flavorful beef with a minimum of fat. At present, these desires are difficult to satisfy without trimming and discarding variable amounts of fat. The importance of this excess waste fat to the beef industry was emphasized throughout a beef improvement conference (41) held at Colorado State University in 1961. This desire for high quality, lean beef with a minimum of fat is presently one of the major objectives of many feeding, breeding, management and meat investigations. For these reasons, in this discussion the term quality will be broadened to include cutability or yield of edible beef. Thus, the effects of methods of feeding, age, weight and sex upon quantitative as well as qualitative traits will be considered.

Feeding Regime

Levels of feeding. The classical growth studies of McMeekan with swine and of Palsson and Verges with lambs have been reviewed by Palsson (35). These studies
show that carcass composition varies markedly with different levels of nutrition during growth and fattening. Larger differences were found in swine than in lambs. But in both of these species maximum amounts of lean and minimum amounts of fat were realized when these animals were fed liberal rations during early growth and somewhat restricted rations when growth rate normally declines and fattening occurs. In this country beef are frequently produced under the opposite procedure. Many cattle are grown primarily on roughage and fattened on high energy rations just prior to slaughter.

Several experiments have been conducted in recent years to compare various levels of feeding in relation to carcass quality in beef. The most extensive of these have been conducted at Oklahoma State University. Researchers at this station (40, 17, 18) conducted a series of three experiments in which rapid and moderate rates of gain were investigated. Feeding was managed to secure four different patterns of gain: (1) rapid gain throughout, (2) rapid gain first half and then moderate, (3) moderate gain first half and then rapid, and (4) moderate rate of gain throughout feeding period. In all three experiments, steers fed to gain rapidly for the entire feeding period produced carcasses which graded highest, had the most fat and the smallest amount of lean. There was, however, no advantage in tenderness; this finding indicated no large differences in quality.

In the first two experiments it was concluded that the moderately fed steers produced the most desirable carcasses. Both of the two mixed patterns of gain3 gave better results than did rapid gain throughout but not as good as did moderate gain throughout. In the third experiment the moderate-high treatment was the most efficient, and the high-moderate produced more desirable results than it did in the first two experiments. It is of interest that, in all three experiments, the two groups of steers fed at the high level during the first half had higher marbling scores than the two groups fed at the moderate rate during the same period of gain. These scores were verified by higher percentages of fat in the eye muscle as determined by chemical analyses. In this series of experiments the steers on rates of gain were fed for the same total gain.

In a fourth experiment reported by the Oklahoma Experiment Station (19), steer calves were fed for rapid gains or moderate gains for the same length of time or moderate gains for the same total gain. Steers fed for rapid gains were the most efficient and produced the highest grading carcasses. It was concluded that there were only small differences, other than fatness, in carcass composition of calves making different rates of gain when slaughtered at the same time or at equal weights. In their most recent publication (16) the Oklahoma investigators reported results of feeding steer calves high or moderate levels of nutrition for either 200 or 400 pounds of post-weaning gain. They concluded that the first 200-250 pounds of gain were highly important since it is during this period that

3/ The two mixed growth patterns or treatments were, as described in previous paragraph, (a) rapid gain first half then moderate, and (b) moderate gain first half, and then rapid.
maximum skeletal and muscular development occurs. They also suggested that beef calves must be full-fed during this growth period if maximum marbling and carcass grade are to be attained.

Winchester et al. (51, 52) found no bad effects on beef quality as a result of under-nutrition of beef calves less than one year of age. Also, a California experiment (43) found no difference in tenderness, juiciness or flavor between steers fed an adequate ration or a protein deficient ration. (These experimental animals were fed for five months beginning at about age one year; then they were subsequently fattened.) Beef from steers fed the adequate ration was darker and redder and the carcasses were heavier, although not significantly so. Pinney et al. (39) also found that calves under-nourished prior to weaning were lighter in weight at 17 months than those which had been well fed early in life.

The effect of winter feeding upon quality beef production has been studied at the Missouri Experiment Station. In 1955 it was reported (37) that steers wintered on a sub-maintenance ration and subsequently fattened produced carcasses which graded lower, had less marbling, less lean and more separable fat than steers wintered to gain 1.5 lb. per head daily. Various levels of protein and energy in wintering rations fed prior to fattening produced differences in carcasses (44, 45). Steers wintered on rations adequate in protein and energy made the most efficient gains and produced the most desirable carcasses. A full feed of corn with adequate protein increased gains and carcass grade. However, efficiency was lower and fat trim higher than in the case of steers wintered to gain about 2 pounds per head daily.

Corn silages. Two of the major feeds fed to fattening cattle in the corn belt are corn grain and corn silage. Well-eared corn silage is unsurpassable in pounds of beef produced per acre of cropland. Thus, a number of experiment stations have conducted experiments to determine the optimum combination of corn and silage for economical gains and carcass values. Neumann et al. (34) at the Illinois Experiment Station fed corn silage for various lengths of time, followed by a liberal ration of shelled corn, to steers fed to similar final weights. In these experiments, as silage was fed longer, the dressing percentage decreased, external fat decreased, marbling increased and the yield of trimmed retail cuts increased. Slaughter grades were lower with the longer silage feeding, but, carcass grades were higher. The highest average carcass grade was obtained from steers fed silage for 224 days but corn for only 63 days.

Young et al. (53) fed steers and heifers corn silage without corn grain for 98 days, and then they full fed corn. They compared these animals to those fed a limited amount of corn with silage for the entire feeding period. All cattle were fed to a similar slaughter grade. No differences were found between these two methods of feeding with regard to total gain, feed efficiency, yield, quality of carcass or amount of fat in the 9-11 rib cut.
Three experiments at the Michigan station with various levels of corn grain and corn silage have been summarized by Deans and Newland (8). In these experiments, steer calves and yearlings were fed to final weights of 1000 pounds and heifers to 900 pounds. When fed to the same final weights steer calves graded choice and yearlings graded good. Whether this difference in grade was due to differences in age, 4 method of feeding or breed is not known. Increased amounts of concentrates in the ration tended to increase the rate of gain, dressing percentage and amount of external fat. Higher levels of corn in the ration raised the quality grade of steer carcasses slightly but did not increase the grade of heifer carcasses. Within treatments, negative correlations were found between the rate of gain and the quality grade. With a high level of concentrates, increases in rate of gain were much greater than increases in marbling. The researchers concluded that increasing the level of corn grain in a corn silage ration is not a reliable method of increasing marbling scores in light weight beef. These results may have been influenced by feeding each animal to a constant weight. That is, the negative relationship between gain and quality grade might not have occurred had all animals been fed for the same length of time.

Two experiments have been conducted at the Ohio Experiment Station (25, 27) to determine the effect of full feeding corn silage or ground ear corn at various stages during growth and fattening. Two rations—a full feed of corn silage and no grain or a full feed of ground ear corn and limited silage—and three periods were studied. In the first experiment, time constant periods were used; in the second, steers were fed for similar gain in each of the three periods. In both experiments, average daily gains were significantly increased by feeding the corn ration in either of the three periods. The increases were similar whether corn was fed in the first, middle or latter part of the feeding period. The dressing percentage was also significantly influenced by feeding corn in each of the three periods. Moreover, the later the corn was fed, the higher the dressing percentage. The area of rib eye and edible portion tended to decrease the earlier the corn was fed. However, the marbling score appeared to increase slightly with the early feeding of ground ear corn. 5

Edible portion, as predicted by this equation, was found to be significantly correlated, 0.85 – 0.96, with actual values of various groups of cattle as determined by physical separation. This equation and a USDA equation based on the same traits were found to be of approximately equal value in predicting either percentage edible portion or boneless, retail trimmed round, loin, rib and chuck.

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4/ These differences were not great.

5/ Percentages of edible portion in the second experiment were estimated by the following prediction equation, as reported by Klosterman, Cahill and Kunkle (29).

\[
\text{Predicted edible portion} = 76.31 - 3.65 \text{ (fat thickness)} - 1.844 \text{ (percent kidney fat)} + 0.430 \text{ (rib eye area)} - 0.0084 \text{ (carcass weight)}
\]
Robertson and Baker (42) studied differences in the microscopic structure of the muscles of steers fed a full feed of corn, a half feed of corn or a full feed of silage and no corn. They found the muscle fibers of the steers full-fed corn were greatest in diameter, those of the silage fed steers were the smallest and those from the half-fed were intermediate in size. They found no true fat within the muscle fibers. These observations likely have no relation to the negative correlation between tenderness and muscle fiber diameter of cattle of different breed and age as reported by Brady (3).

Pasture. Longwell (31) reported that brightness of the lean of beef was related to the degree of finish and that grass, per se, did not produce dark lean beef.

Bull, Snapp and Rusk (6) reviewed the literature and compared cattle fed on pasture and in dry lot. Cattle fed on pasture without grain dressed and graded lower because of less finish. When full-fed grain to a similar degree of finish, pastured cattle dressed as high and were as palatable as cattle fed in dry lot. Moreover, their carcasses shrank no more. However, pastured cattle often graded lower because of yellow fat, a reduction in grade which the authors concluded was not justified.

A South Carolina experiment (13) compared steers fattened to a grade of U.S. good in dry lot or on winter pasture with various grains. They found no differences in carcass grade, yield, percent fat, lean or bone, area of rib eye or percent moisture or fat content of the rib eye as a result of the method of feeding. The iodine number of the fat of cattle fattened in dry lot was significantly lower than that of cattle fed on pasture without grain.

McCampbell et al. (32) found carcasses from cattle fed on winter pasture to have less external finish, lower conformation grades and a tendency toward yellow fat as compared to carcasses from cattle fed in dry lot. Cattle fed grain on pasture had higher conformation grades but not higher finish grades than cattle on pasture without grain. These cattle were fed 4-6 pounds of grain per head daily (2), an amount apparently sufficient to produce superior muscular development without increasing the deposition of fat.
Hiner and Hankins (21) studied tenderness of several beef cuts from animals varying from 10-week-old veal calves to 5 1/2-year old cows. Tenderness decreased as the animals aged and differences between the extreme ages were highly significant. However, differences between veal and beef from 500 pound steer calves were not statistically significant.

Bray et al. (4) reported that the moisture and ash content of connective tissue decreased and the fat content increased with the age of beef cattle. They postulated that factors other than fat within the connective tissue are responsible for tenderness.

A number of reports on the effect of animal age upon carcass composition and quality have been published by the Oklahoma Experiment Station (46, 47, 48). They have studied carcasses from Hereford steers and females varying in age from 6 to 90 months. Tenderness of rib eye steaks decreased significantly with increasing age. The greatest difference between 18, 42 and 90 months was between the 18 and 42 month age groups. Tenderness and marbling were not associated in the 18 month cattle but were in those 42 and 90 months of age. Taste panel flavor and juiciness did not appear to be related to age or marbling. The color of rib eye steaks became a darker red with advancing animal age.

Muscle fiber diameter increased with animal age (48) and tenderness decreased with fiber size. However, within age groups there was little relationship between fiber diameter and tenderness. The average fiber diameter was significantly related to the area of rib eye and to the total carcass lean. However, when the effect of animal age was removed these correlations were no longer significant. Chambers (7) has stated that variations in tenderness of cattle slaughtered at about 13 months of age are small and of little real importance. A similar observation has been made from unpublished data at the Ohio Experiment Station.

Hendrickson et al. (20) have reported the following effects of animal age upon carcass composition when marbling levels were similar at all ages. The dressing percent increased, the percent of hind quarter and round decreased, fat increased and the percent of lean decreased with advancing age. The rapid increase in the percentage of fat indicated that the total fatty composition of the carcass was not directly associated with marbling. They indicated that maximum muscular development occurs between 12 and 18 months of age.

**Weight**

The effects of methods of feeding, age and weight are difficult to separate. Animals fed differently are likely to be of different age or weight, and animals of

6/ Correlation of 0.83  
7/ Correlation of 0.73
different ages will vary in weight, etc. In many instances there were differences in weight of animals in the experiments discussed above.

Ewing et al. (10) started with steers one year of age. One group was fattened on a full feed of corn, a second group was fed to gain 1.5 lb. daily for 155 days and then fattened and a third group was fed a maintenance ration for 221 days and then fattened. All groups were fed to the same degree of outside finish as determined by ultrasonic equipment. Carcasses from steers in the first group tended to grade and yield lower, had significantly less intra-muscular fat, less separable fat, and more separable lean than carcasses from steers in the other two treatments. Moreover the shear test values of the cooked steaks were significantly lower. These results were verified by a second experiment reported in 1962 (11).

Goll, Kline and Hazel (14) studied relationships between carcass grade, weight, yield of wholesale cuts and carcass measurements. Three weight groups within each of the choice, good and standard grades were investigated. The researchers found that grade or finish had the greatest influence on yield of wholesale cuts and that carcass measurements were influenced the most by differences in weight. There were large and consistent differences among carcasses of the same grade and weight.

Sex

Steers vs. Heifers. Many experiments have been conducted to compare the performance and carcass quality of steers and heifers. Many of these have been reviewed by Morrison (33). In general, heifers gain a bit slower and fatten at a younger age and lighter weight. If fed to the same degree of finish there is little difference in rate of gain, cost of gain, dressing percentage, retail value, tenderness and palatability. However, since heifers fatten at younger age and lighter weight they are frequently fed to a higher degree of finish than steers. Under these conditions, gains of heifers will be slower and more costly and their carcasses will contain more waste fat. Previously unpublished data from the Ohio Station are given in the following table.
COMPARATIVE CARCASS DATA OF YOUNG STEERS AND HEIFERS SLAUGHTERED AT
SIMILAR AGES

<table>
<thead>
<tr>
<th></th>
<th>Steers</th>
<th>Average</th>
<th>Heifers</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live wt., lb.</td>
<td>105</td>
<td>810</td>
<td>92</td>
<td>728</td>
</tr>
<tr>
<td>Chilled carcass wt., lb.</td>
<td>&quot;</td>
<td>487</td>
<td>&quot;</td>
<td>438</td>
</tr>
<tr>
<td>Dressing percentage</td>
<td>&quot;</td>
<td>60.1</td>
<td>&quot;</td>
<td>60.2</td>
</tr>
<tr>
<td>Carcass grade^2</td>
<td>&quot;</td>
<td>10.5</td>
<td>&quot;</td>
<td>10.3</td>
</tr>
<tr>
<td>Edible Portion, %</td>
<td>&quot;</td>
<td>69.8</td>
<td>&quot;</td>
<td>67.4</td>
</tr>
<tr>
<td>Fat trim, %</td>
<td>&quot;</td>
<td>14.8</td>
<td>&quot;</td>
<td>18.5</td>
</tr>
<tr>
<td>Bone, %</td>
<td>&quot;</td>
<td>15.4</td>
<td>&quot;</td>
<td>14.1</td>
</tr>
<tr>
<td>Area rib eye, sq. in.</td>
<td>74</td>
<td>.50</td>
<td>68</td>
<td>.58</td>
</tr>
<tr>
<td>Area rib eye per cwt. carcass</td>
<td>63</td>
<td>2.03</td>
<td>54</td>
<td>6.7</td>
</tr>
<tr>
<td>Kidney fat, %</td>
<td>&quot;</td>
<td>2.9</td>
<td>&quot;</td>
<td>3.7</td>
</tr>
<tr>
<td>Fat thickness, in.</td>
<td>63</td>
<td>6.1</td>
<td>27</td>
<td>5.8</td>
</tr>
<tr>
<td>Marbling score^3</td>
<td>28</td>
<td>6.1</td>
<td>27</td>
<td>5.8</td>
</tr>
<tr>
<td>Tenderness^4</td>
<td>28</td>
<td>6.1</td>
<td>27</td>
<td>5.8</td>
</tr>
</tbody>
</table>

1 Off feed and water overnight minus 3 percent.
2 Low choice, 10; average choice, 11.
3 Modest, 6; Moderate, 7.
4 1, very tough to 10, very tender.

The data presented in the previous table were obtained over a period of years from a breeding project in which steers and heifers were fattened immediately following weaning and slaughtered at about 14 months of age. These results are in general agreement with other experiments in which steers and heifers were fed for similar periods of time but to heavier weights.

**Steers vs. bulls.** In the past, bull carcasses have been discriminated against. This has most likely been due to the lack of quality of aged bull beef and the thought that these traits are more or less characteristic of all bull carcasses.

A number of experiments (1, 12, 5, 22, 23, 24, 50, 30, 38) have shown that bull calves gain more rapidly and efficiently and produce carcasses with a higher proportion of lean than steers. These differences were found to be highly significant. Bull carcasses have generally graded lower because of less marbling and external fat. In some experiments no differences were found in tenderness and palatability and in others steers were found to be slightly more tender than bulls. No undesirable flavors or aroma of bull beef have been reported.
Discussion

In interpreting results of beef cattle feeding experiments it is important to consider the controls applied to each experiment. Cattle may be fed to a constant age, weight, grade, fat thickness, date, etc. Tests may also be on the basis of individual animals or on lot averages. All methods have their advantages and disadvantages, and the one selected by an investigator is based upon the primary objective of the experiment to be conducted. However, in considering the results obtained, the reader must remember the conditions imposed upon the experiment. Different methods may lead to different results. For example, in an Ohio experiment (26) in which cattle were fed to a constant age, there was a positive relationship between rate of gain and amount of fat in the carcass. However, when cattle were fed to a constant weight in a Missouri report (15) the opposite relationship was found.

There is not complete agreement in the literature on the effects of levels of feeding upon subsequent carcass value. However, it appears that young animals should be fed liberal rations in order to attain maximum muscular development. It is well agreed that tenderness decreases as age increases. Tenderness is apparently the trait of most importance to the consumer. Amounts of external finish or waste fat also increase with advancing age. Waste fat is the major complaint of the retailer. It would thus appear that young beef animals which are known to be destined for ultimate slaughter should be grown and finished at as young an age as possible. As soon as such animals have attained the desired finish they should be slaughtered and not held for heavier weights. Live beef cattle should be considered a perishable product and sold when ready for market.

When total feed costs of beef production are considered (including that required to maintain a cow herd), the production of young slaughter cattle also appears to be the most economical (28). Even under the best of performance, maintenance requirements are high and hence costly. The younger that cattle can be brought to market weight and condition the lower their total maintenance needs.

Marketing cattle at young ages does not necessarily mean that they need to be fed high energy, expensive rations. Productive dams and high quality roughages are key factors as well as efficient fattening rations. Post weaning gains should be the maximum which are compatible with the economy of the ration. In the corn belt, such a ration will include liberal amounts of corn silage. In other areas it may or may not include other good quality roughages depending upon availability and hence relative feed costs.

You have to maintain a beef cow for a year to produce a calf. Fortunately, her nutrient requirements for production are not high during much of the year. Therefore, it is advisable to utilize low quality roughages with a cow herd rather than through cattle destined for market. It is true that certain ranges and farms are not adapted to cow-calf operations, and in some areas young cattle must be used as a buffer.
against changing weather conditions and carrying capacities. However, the further the industry can move toward the using of poor quality feeds by cows and the marketing of slaughter cattle at young ages the more profitable the industry as a whole will become. With an ever increasing demand for feeder cattle, it is likely that numbers of cows in farming areas will continue to increase in order to utilize efficiently corn stover and other low quality forages.

More and more meals are being eaten in hotels and restaurants. Thus, there will be a continued market for highly finished cattle. However, as related to total beef production, this market is likely to remain limited. With the present emphasis on marbling, sufficient numbers of such cattle will be produced. Most likely, too many producers will continue to aim for the top of the market, whereas, a slightly lower selling price with considerably lower costs of production would be more profitable.

The dressing percentage, although a desirable trait, may be misleading and can be over-emphasized because of its positive relationship to fat. The fatter the carcass the higher the dressing percentage, but the lower the percentage of edible beef that carcass will yield. Except for the inaccuracies of live cattle weights caused by differences in fill, live weight should be more closely associated with weight of edible beef than carcass weight. That is, the opposing effects of fat are cancelled when weight of edible beef is related to live weight rather than to carcass weight.

With regard to sex, steers, heifers and bulls will all produce highly desirable beef. Of these, steers are the most versatile and can be adapted to the widest range in management, methods of feeding, weight and age at slaughter. Heifers are somewhat more limited by age and hence systems of management. They are best adapted to a short feed and slaughter at light weights. Bulls are definitely limited by age and should be fattened shortly after weaning. If fattened at a young age, bulls will produce the most lean beef of desirable quality with the lowest cost of production.

The following table is based on average results of five experiments which involved a total of 190 steers and bulls conducted at the Ohio Experiment Station (24). In these experiments choice grade feeder steer and bull calves of the same age and quality were compared. These results suggest that, with a narrow spread between good and choice grade carcass beef, it should be possible for all segments of the beef industry to profit from feeding bulls rather than steers.

If feeder calves were not castrated they would be the same quality as steers and hence worth as much per pound. Bulls tend to gain more from birth to weaning and hence the feeder calf producer would receive about $5.00 more per head.

Bull calves will gain more rapidly in the feed lot with a lower feed cost per hundredweight of gain than steers. Even though a feeder paid $5.00 more per head, the final cost of the bulls at the end of the fattening period would be nearly $1.50
a hundred less than the steers. Dependent upon sale price, bulls could, therefore, show more profit than steers for the cattle feeder.

The biggest advantage in favor of bulls appears in the carcass. Bulls yield a slightly lower percentage of carcass but the carcass will contain a much higher proportion of edible meat. Hence, fat, young bull carcasses would also be profitable to the packer and retailer. The preceding table shows that bulls will produce a pound of edible meat for nearly five cents less than steers. Competition in the beef industry should eventually pass part of this advantage back to the producer and feeder and part to the consumer.

These advantages of bulls are based on fattening and slaughtering at a young age, under 18 months. Obviously, mature bulls would not produce carcass beef comparable to that from steers. When bulls are fattened immediately following weaning their carcasses will be nearly as tender as steer carcasses and they can be liberally fed without producing excess, waste fat.

Some of the advantages of feeding bulls could be realized by feeding steers only to good grade rather than choice. This, however, would necessitate feeding a less efficient ration to an older age or slaughtering at considerably lighter weights. Generally speaking, young animals make more efficient gains than older animals. The most efficient rations are those that produce maximum rates of gain. Bulls can be fed to a desirable weight at a young age with lower feed costs and less waste fat.
## Comparative Costs of Edible Beef as Produced by Steers and Bulls

<table>
<thead>
<tr>
<th></th>
<th>Steers Average</th>
<th>Steers Cost</th>
<th>Bulls Average</th>
<th>Bulls Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial weight, lb.</td>
<td>440 @ .25</td>
<td>110.00</td>
<td>460 @ .25</td>
<td>115.00</td>
</tr>
<tr>
<td>Average daily gain, lb.</td>
<td>2.06</td>
<td>110.00</td>
<td>2.46</td>
<td></td>
</tr>
<tr>
<td>Final wt., 250 day feed, lb.</td>
<td>955</td>
<td>110.00</td>
<td>1075</td>
<td></td>
</tr>
<tr>
<td>Feed per cwt. gain, lb.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corn and Supplement</td>
<td>564</td>
<td>110.00</td>
<td>485</td>
<td></td>
</tr>
<tr>
<td>Roughage</td>
<td>201</td>
<td>110.00</td>
<td>174</td>
<td></td>
</tr>
<tr>
<td>Feed cost per cwt.</td>
<td></td>
<td>13.78</td>
<td>11.88</td>
<td></td>
</tr>
<tr>
<td>Feed cost per head (gain x cost)</td>
<td>70.97</td>
<td></td>
<td>73.06</td>
<td></td>
</tr>
<tr>
<td>Total cost per head</td>
<td>$180.97</td>
<td>$188.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total cost per cwt. (cost/wt.)</td>
<td>18.95</td>
<td></td>
<td>17.50</td>
<td></td>
</tr>
<tr>
<td>Grade</td>
<td>Choice</td>
<td>Good</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dressing percentage</td>
<td>61</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carcass wt., lb.</td>
<td>583</td>
<td>60</td>
<td>645</td>
<td></td>
</tr>
<tr>
<td>Carcass cost per cwt. (cost/wt.)</td>
<td>31.04</td>
<td></td>
<td>29.16</td>
<td></td>
</tr>
<tr>
<td>Edible portion, %</td>
<td>72.7</td>
<td>60</td>
<td>77.1</td>
<td></td>
</tr>
<tr>
<td>Edible portion, wt. lb.</td>
<td>424</td>
<td>60</td>
<td>497</td>
<td></td>
</tr>
<tr>
<td>Edible portion cost per cwt. (cost/wt.)</td>
<td>42.68</td>
<td></td>
<td>37.84</td>
<td></td>
</tr>
</tbody>
</table>

1 Concentrates $40.00 and roughage $25.00 per ton.
References


