ANNUAL AND AVERAGE PROFITABILITY OF VARIOUS ALTERNATIVES AMONG BEEF CATTLE SYSTEMS FOR NORTHEAST KANSAS, 1925-1955

by

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TABLE OF CONTENTS

THE PROBLEM

In livestock production, the alternatives of producing beef cattle present an economic problem. There are a number of systems or programs of producing beef cattle. Some of these include: (1) wintered steers, (2) wintered and grazed steers, (3) wintered and full fed steers, (4) deferred fed steers, (5) deferred fed heifers, (6) full fed steers, (7) full fed heifers, (8) cow herds, selling calves off grass, and (9) cow herds and creep fed calves. In turn, there are alternative ways to handle each system.

The purpose of this study was to analyze the profitability of a number of the choices for each system. The total group of choices studied embraces a large number of the alternatives of interest to farmers in Northeastern Kansas.

For any given alternative, the variables which affect returns were believed to be livestock prices, feed costs and livestock gains.

This study was restricted to a consideration of a best method of producing beef cattle over time. Although the data were handled in a way to enable a study of variability of returns, predictability of income, returns in adverse years, etc., these problems were not studied here but could be studied later as a part of a broader study.

SOURCE OF DATA

Livestock Prices

The prices used for beef cattle were monthly averages of ten-day top prices, and were taken from the Kansas City Daily Livestock Market Reports. These prices were available by grades, and although there were problems of a few missing prices and a few changes in grades, the prices were believed to be reliable.

Feed and Pasture Costs

The feed prices used were yearly average prices for Brown and Doniphan Counties in Northeast Kansas. These were obtained from unpublished data, Department of Agricultural Economics, Kansas State College. Pasture costs were obtained by using pasture rental quotations published by the Crop Reporting Service, and these apply primarily to the Flint Hills region. Here, too, a small number of costs were missing and they were estimated.

Production

The production data for the beef cattle feeding programs included in this study were taken from beef feeding trials of the Kansas Agricultural Experiment Station at Manhattan and the Branch Experiment Station at Hays. The earliest experiment included was reported in 1940 and the latest was reported in 1957. The experiments were typically the result of a lot of 10 animals receiving the treatment. In many cases, the same experiment was conducted more than one year. The number of head is shown for each alternative studied.

The daily ration fed is presented on a phase basis, and these data are useful in describing the particular alternative. The total feed fed, both per phase, and for the entire system, is also included, and these data are valuable for farm planning purposes.

Other information as length of phase, date and grade of animal at the beginning and the end of the phase were presented. In some cases, it was necessary to estimate grades, especially for the end of those phases that were succeeded by other phases. Grades were usually available only when the animals were purchased or sold. The inaccuracies in estimates may be large and some farmers may need to make adjustments in them to fit their own conditions.

The gain per head was presented by phase and these data were believed very reliable. However, since the data were obtained from feeding trials, they may not be appropriate for farmers producing cattle less efficiently. It was assumed that the input-output relations used in this study would be typical of those for farmers following superior management practices.

PROCEDURE

The objective of studying profitability of alternatives was carried to a phase basis as well as a total for the alternative. For feeding programs of more than one phase, it was believed that this more intensive study would show a more complete picture for an alternative and would be of special value for those phases where results are contingent upon the treatment during preceding phases. In all cases, a summary analysis was provided for those alternatives involving more than one phase.

The profitability level is a "gross profit" figure. Charges for transportation, interest on investment, death loss, veterinary expense, buildings, labor, processing feed, and fencing were not deducted. These costs should be covered by the "profit" figures as reported.

Livestock prices used were those appropriate for the grade and the date the phase started or ended.

The analysis was not extended to a consideration of different dates for alternatives otherwise similar. This further study is possible, but it is improbable that the input-output relations would be the same for other dates.

THE ANALYSIS

The analysis proceeded through construction of annual budgets for each alternative, by phase. For a given alternative and phase, the annual budgets differed due to annual variations in livestock and feed prices, and input-output relations were assumed constant over time. The study then is the result of submitting the production relations to the variety of price and cost relations that existed over time.

Annual budgets were constructed for each year for the period 1925-1955, years for which all necessary data were available. This period included two periods of relatively good years, the late 1920's and during and after World War II. It also included two periods of relatively poor years, those of the early and mid-thirties and a period in the early 1950's. None of the annual calculations were presented, but averages and a limited number of frequency distributions were reported.

The annual budgets, and the averages presented here, consisted of three groups: (a) feed costs, (b) animal values at the beginning and end of each phase, and (c) certain efficiency and profitability calculations. Feed was broken down into three portions: farm raised roughages, farm raised grains and commercial feeds. It was believed that this classification was a meaningful one where the frame of reference is a farmer considering alternative uses, including feeding, or purchasing or selling of feed. Commercial feeds are a clear case of feeds that are bought and they differ from the other groups. Farm raised grains can either be sold or fed, or purchased and fed. Costs of handling and transporting this type of feed are sizeable but not as extensive as for roughages. This type of feed is more difficult to move, and it is difficult to attach unit values to it.

The weight, percent of animals of various grades, date, price per hundredweight and value per animal are presented for the beginning and the end of each phase. The gain and feed cost per hundredweight of gain were presented for each phase.

The first profitability calculation presented was the difference; selling value minus the cost of animal. This difference should cover the costs of feed (and all other costs). The second calculation, selling value minus the cost of animal minus the cost of commercial feed gives a residual figure to cover the costs of farm raised feeds. For those farmers who raise their own grain and roughage, this calculation shows what remains after out-of-pocket costs for the animal and purchased feed have been charged.

The calculation: selling value minus the cost of animal minus the cost of commercial feed minus the cost of grain leaves a difference to pay costs of roughage. Frequently, farmers with a given roughage supply, including hay, pasture, and silage, look for the livestock system that will yield the greatest return to the feed, and will feed the roughage unless it will bring more than the greatest difference as calculated here for the superior livestock alternative. The roughage supply may be a restriction, and although it may be sold, if fed, will be fed to that type of livestock for which "returns for roughage" are greatest.

The final calculation: selling value minus the cost of animal minus the cost of commercial feed minus the cost of grain minus the cost of roughage is a return more like "profit" and should be large enough to cover all costs not included in this study, as cited above. The derivation of this measure assumes all feeds can be priced, especially roughage. If they can be assumed to be valued, this measure can be calculated and is net of all feed costs. For

each phase, a frequency count was made for this measure, giving the number of years "profits" were negative, $0 to $10.00, $10.00 to $20.00, $20.00 to $50.00 and above $50.00. The measure, "Returns per dollar of total cost" was derived by dividing this "profit" measure by the total costs of the animal plus the cost of the feed.

The calculation "Returns per dollar of feed cost" was derived by dividing the value of the animal minus the cost of animal by the total cost of all feed.

For cow herd systems, somewhat different calculations were derived. There was no cost-of-calf figure as in the purchased cattle systems. The measure "Value calf per dollar total feed cost" was derived by dividing the selling value of the calf by the total feed cost. The measure "Returns per dollar total feed cost" was derived by dividing the difference; selling value of calf minus the total feed cost, by the total feed cost.

Wintered Steers

Wintering beef cattle is a method of feeding which utilizes a number of lower quality feeds and normally contains a high proportion of roughage. Gains are usually small. However, this depends on the proportion of roughage to grain. Since most of the ration is made up of lower quality feeds, cheap gains can be realized. The wintering program is best suited for feeders who have some roughage, and possible stalk fields but little or no pasture or grain. Cattle handled under the wintering program are usually fed a little longer for a greater gain than where cattle are to be grazed or full fed after the wintering phase.

Four different feeding programs of wintering steer calves were budgeted and the results are presented in Table 1.[1] Program B consisted of a ration of prairie hay and protein supplement without grain. Good to choice calves were used. The program resulted in the lowest average returns of the four trials with a profit or a return above feed and animal cost of $9.84 for the 31-year period, 1925 to 1955. The return per dollar of total feed cost was $1.73 while the return per dollar of total cost was .1039 or slightly over 10 percent. The program also resulted in negative returns, or a failure to cover all costs in seven out of the 31 years. This occurred mainly in the period 1931 through 1936 and in 1952 and 1953. Returns from zero to $20.00 resulted in 19 years and returns above $20.00 occurred in five years with the greatest return occurring in 1951 when the profit figure reached $55.00. The greatest loss, $28.00, occurred in 1953, a year when most programs were not profitable.

Program D consisted of a ration of 30 pounds of silage, four pounds of grain and one pound of protein. This program of wintering resulted in the largest gain, both weight and dollar-wise, with a total gain of 238 pounds and an average profit figure of $18.80 or almost twice the return as shown for Program B above. The net result was a relatively low feed cost of $8.88 per one hundred pounds of gain. The return per dollar of total feed cost was $1.89 and the return per dollar of total cost was .2165 or approximately 22 percent. In contrast to Program B above, this program resulted in negative returns only once in the 31-year period studied. This occurred in 1934 and the loss was only $4.83. Program D had 16 years of returns between zero and $20.00 and 14 years of returns above $20.00. Returns of over $50.00 were

[1]All tables are in the Appendix.

realized in three years, 1948, 1950 and 1951. The largest return, $83.00, occurred in 1951.

Program C had a very heavy silage ration, 39 pounds per day, with 1.75 pounds of grain and 1.25 pounds of protein. Although the gain was good and the feed cost per 100 pounds of gain relatively low, the returns were similar to Program B. The return per dollar of feed cost was $1.58 and the return per dollar of total cost was .1130 or 11 percent. Again negative returns were present, occurring for six years, mainly in the period of 1932 through 1936. The greatest loss occurred in 1934 and it was $7.50. The greatest return, $50.64, was in 1951. Returns of zero to $20.00 occurred in 21 years.

The fourth wintering Program E, had a ration composed of 30 pounds of silage, 1.75 pounds of grain and five pounds of ground alfalfa. The ground alfalfa was alfalfa hay which had been run through a grinder to chop up the stems in an attempt to reduce waste. This method may be used in cases where the alfalfa hay is not of high quality, and the grinding may increase the palatability of the alfalfa. Since only a small amount of grain and no protein was fed, the total cost of feed was relatively low, and likewise the feed cost per hundred pounds of gain was low. The returns above feed and animal cost produced $15.40 per year on the average. Negative returns occurred in six years while returns from zero to $20.00 appeared in 18 years. In 1948 and 1951 returns of over $50.00 were experienced with the largest return, $69.50, appearing in 1951. The greatest loss, $6.72, appeared in 1934. The return per dollar of total feed cost was the largest of the four programs budgeted. This return was $1.94, while the return per dollar of total cost was .1674 or approximately 17 percent.

It would appear that the most profitable method of wintering steers would be one which included about four pounds of grain daily. Reliance on roughage

alone resulted in very poor returns even though good to choice quality calves were used in the feeding trials and the end result produced choice stocker calves. The returns experienced were mainly from increases in quality and price differential rather than from weight gains. Also the greatest return was realized from the lightest purchase weight animals, while the smallest returns resulted from wintering the heaviest calves.

Program D which had the ration containing four pounds of grain was superior to all other wintering programs in 27 years out of the 31-year period as far as profits were concerned. Program E was superior in three years, and Program B was superior in one year while Program C was never superior.

Wintered and Grazed Steers

The wintering and grazing program is handled similarly to the wintering program. The main difference being that the wintering phase may be shortened and the grazing season added. This program also utilizes a great deal of roughage and is well adapted to areas having summer grass and producing roughages such as alfalfa and silage. No grain is required and if a good legume is fed, no protein supplement is needed.

Four different methods of handling a wintering and grazing program were budgeted. In all cases the grazing ration was made up of grass alone, however, the wintering ration differed considerably. Two programs received no grain, while one program received two pounds and another received four pounds of grain. The calves used were of good quality. The results of the four programs are presented in Tables 2, 3, 4 and 5.

Program A had a wintering ration of one pound of protein supplement and 26.35 pounds of silage daily. Since only good quality calves were used, and due to the high roughage ration, the wintering phase resulted in very low

profit. The average profit for the 31-year period was only $1.52 per head with negative returns occurring in 14 years. Returns of zero to $20.00 were realized in 16 years and returns were above $20.00 per head for only five years. The return per dollar of feed cost was $1.11 while the return per dollar of total cost was .0197 or only two percent. Results for the grazing season were somewhat better as the average profit figure was slightly better than $20.00 per head, with negative profit in only three years. The return per dollar of feed cost was $3.59 and the return per dollar of total cost was .2346 or about 23.5 percent. The reason for the relatively high return for the grazing period is probably due to the lack of a full winter ration. In summarizing the two phases, the average profit per head totaled $21.85. Negative profit occurred in seven years while profit above $20.00 per head was realized in 15 years. The largest return occurred in 1950 when profit reached slightly more than $100.00 per head. Three years later the greatest loss was realized, being more than $15.00. The overall return per dollar of feed cost was $2.03 and the overall return per dollar of total cost was .2571.

Program C differs from Program A in that it contained two pounds of grain per day in addition to prairie hay and protein in the wintering ration. Again good quality calves were used; however, the returns for the wintering phase were much greater than for Program A. The average profit over the 31-year period was $6.18 per head for the period mentioned. Negative returns appeared in eight years as compared to 14 years for A. The majority of returns fell in the zero to twenty-dollar-range, that group containing 19 years. The return per dollar of feed cost was $1.36 while the return per dollar of total cost was .0760. The grazing ration consisted of grass alone and the returns were somewhat lower compared to A. This is probably due to the better method of

wintering which produced somewhat larger weight gains. It is believed that a calf wintered well will not put on the gains on pasture as one that is not wintered well. The average profit for the grazing period was $15.54, with four years of negative returns. Returns of over $50.00 occurred in two years, 1950 and 1951. Returns per dollar of feed cost and returns per dollar of total cost were $2.99 and .0163, respectively. Summarizing the two phases, it was found that the average return or profit per head was $21.72. This is slightly smaller than the overall return for A above. Negative profit appeared in seven years from 1930 to 1936, and again in 1952 and 1953. The most negative return occurred in 1953 and the largest positive return in 1950. Returns were over $50.00 for five years. The overall return per dollar of feed cost was $1.86 and the overall return per dollar of total cost was .2436.

Four pounds of grain were included in the wintering ration of Program D as contrasted to two pounds in Program C and none in Program A. Prairie hay and a protein supplement were fed in addition to the grain. As might be expected, the profit figure was the greatest of the three above mentioned programs. The average profit figure for the wintering phase was $8.93; however, negative returns still occurred in eight years. The greatest loss, $17.23, appeared in 1953 while the largest return occurred in 1950 when profits reached almost $46.00 per head. The return per dollar of feed cost and the return per dollar of total cost for the wintering phase was $1.42 and .1048, respectively. Since the gains from wintering were fairly good, lower returns resulted from the grazing season than in the above programs. The average profit for the grazing phase was $11.84 per head while the return per dollar of feed cost was $2.51 and the return per dollar of total cost was .1162. Negative returns appeared in seven years with the greatest loss, $24.00,

occurring in 1952. Returns from zero to $20.00 occurred in 18 years. In summarizing the two phases of Program D, the average profit figure totaled $20.77 with the overall return per dollar of feed cost and the overall return per dollar of total cost being $1.72 and .2234, respectively. Seven years of negative returns were experienced while in five years, profits exceeded $50.00. The greatest loss occurred in 1953 and the largest gain in 1950.

The wintering ration of program G was composed of prairie hay and protein. No grain was fed during the wintering or grazing phases. The average profit for the wintering phase was similar to Program C, being $6.29 per head. Negative returns appeared in nine years with the majority of the returns falling in the zero to twenty-dollar-range. The return per dollar of feed cost was $1.46 while the return per dollar of total cost was .0775. The grazing season produced profit of slightly more than $16.00 with negative returns occurring in only two years. Returns of over $50.00 appeared in two years also. The return per dollar of feed cost was $3.05 and the return per dollar of total cost was .1684. In summary, the wintering and grazing phases of Program G produced a return of $22.32 over feed and animal cost. Negative profit appeared in five years with the greatest loss occurring in 1953. This was slightly more than $24.00. Profits above $50.00 occurred in four years. In 1950 the return was almost $100.00 per head. The greatest portion of the returns fell in the range of $10.00 to $50.00. The total return per dollar of feed cost was $2.04 and the total return per dollar of total cost was .2512.

Program G appears to be the most profitable method of wintering and grazing steers. These steers received a wintering ration of prairie hay and protein and no grain. However, somewhat better grade steers were used in Program G than the other programs. Program G was superior profit-wise 14 years out of the 31-year period while Program A was superior in ten years. Program A, as

for Program G, received no grain in the wintering ration, but received a moderately heavy ration of silage with protein. Program C was superior in three years while Program D was superior in four years. Program C received two pounds of grain while Program D received four pounds. The results of the wintering and grazing programs are opposite the results of the wintering programs where the best results appeared from a daily ration including four pounds of grain. However, the range of the four above programs was quite small, varying by only slightly more than $1.50 per head so it would be almost a matter of indifference as to which method of wintering and grazing was followed.

Wintered and Full Fed Steers

The wintering phase is normally handled very much like the wintering phase of the wintering and grazing programs, except that a good winter gain will probably be more beneficial when going on full feed than onto grass. Wintering and full feeding is also very similar to the deferred feeding program except that the grazing phase is omitted. This program was studied as it seems particularly well suited for Northeast Kansas where pasture is limited, while roughages and grains are in abundance.

Three programs were budgeted using different methods of wintering. Program J received no grain, Program K received two pounds per day, and Program E received four pounds of grain per day. The steers used were mostly of good to choice quality. The results of the three programs are presented in Tables 6, 7 and 8.

Program J had a wintering ration of silage and a protein supplement but no grain. As a result, the average profit per head was only slightly more

than $4.00. Profits were negative for 12 years, with the returns for most of the years falling in the zero to twenty-dollar-range. The return per dollar of feed cost was $1.33 and the return per dollar of total cost was .0504 or five percent. The ration for the full feeding phase consisted of about 12 pounds of corn, prairie hay, a small amount of alfalfa hay and protein. The results were very poor. The average profit was a negative 37 cents. Negative returns appeared in 16 years with the greatest loss, $51.12, occurring in 1952. The results of the two phases produced a profit of only $3.75 per head with negative returns occurring in 13 years. Most of the losses appeared during the "thirties" and again after 1952. The greatest loss was $59.50 which occurred in 1952. Profit surpassed $50.00 in only one year, 1950, when the figure reached $72.17. The total return per dollar of feed cost was $1.06 while the total return per dollar of total cost was .0290 or less than three percent.

Program K differed from Program J in that the wintering ration contained about two pounds of grain per day in addition to silage and protein. The profit realized from the wintering ration was $14.21, which was considerably greater than for Program J. Negative profit appeared in six years and returns of zero to $20.00 occurred in 19 years. The returns per dollar of feed cost and the returns per dollar of total cost were $1.58 and .1446, respectively. The full feeding phase also excelled over Program J. The ration for the full feeding phase contained 12 pounds of grain, silage, ground alfalfa and protein. The main difference in rations being silage in Program K and prairie hay in Program J. The average profit was $9.09 per head compared to a negative return in Program J. In 11 years, negative returns were experienced, with the return per dollar of feed cost being $1.25 and the return per dollar of total cost equal to .0610.

In summary the wintering and full feeding phases of Program K produced an average profit of $23.29 per head. Profits were negative for eight years, while profits above $50.00 occurred in five years. The two extremes here were a negative $19.00 and a positive $119.63. The overall return per dollar of feed cost was $1.38 and the overall return per dollar of total cost was .1727 or slightly over 17 percent.

Program E had a wintering ration of four pounds of grain besides silage and protein. The returns per dollar of total cost was .1919 while the returns per dollar of feed cost was $1.64. The average profit per head was $12.91 which is slightly less than the profit realized from Program K and considerably more than the profit from Program J. Negative returns occurred in seven years with the greatest loss, $12.00, appearing in 1934. The greatest profit occurred in 1951 when the figure reached slightly more than $72.00. The full feeding ration contained almost 16 pounds of grain, protein and small amounts of both alfalfa hay and prairie hay. The average profit for full feeding was $15.77 which is somewhat greater than the profit realized from Program K. The returns per dollar of feed cost was $1.31 while the return per dollar of total cost was .1200.

The overall profit for the two phases was $28.68, with negative returns occurring in seven years. The greatest loss was slightly more than $22.00 and this occurred in 1936. The largest profit occurred in 1948 and was $143.53. Most of the returns fell in the range of $20.00 and above, this group containing 19 years. The overall return per dollar of feed cost was $1.40 and the overall return per dollar of total cost was .2421 or slightly more than 24 percent.

In wintering and full feeding steers, it would appear that the most profitable feeding program was one which had at least four pounds of grain in the

wintering ration. Program E was superior to the other two programs in 19 years. Program K was superior in nine years while Program J was superior in three years.

Deferred Fed Steers

Deferred feeding is a system of producing beef which has been believed well suited for Kansas. There are three distinct phases involved, (1) wintering, (2) summer grazing and (3) full feeding. Deferred feeding utilizes many farm raised roughages and grains in addition to grass. It provides a ready market for these feeds that might otherwise be a problem to market. Deferred feeding uses young, lightweight cattle of good and choice quality and is designed to fit the price trends. Steers are normally purchased in the fall when feeder cattle are plentiful and low in price. They are sold the following fall as fat butcher cattle when prices are generally higher.

Two different programs of deferred feeding were budgeted. Program E is a typical deferred feeding system with a wintering ration of five pounds of grain fed per head daily. Program B received five pounds of grain per day during the wintering phase, but the steers were full fed on pasture rather than in the dry lot as in Program E. Utilizing pasture in the full feeding phase reduces the amount of roughage needed in the ration.

The wintering ration of Program E contained silage, protein and a small amount of alfalfa and prairie hay in addition to the five pounds of grain, Table 9. The average profit for the wintering phase was $15.37 which compares favorably with returns realized from the wintering Program D, which received four pounds of grain daily. Negative returns appeared in four years while the major portion of the returns fell in the range of zero to $20.00. The return

per dollar of total cost was .1821. The grazing phase produced a very poor return, only 45 cents per head on the average. Negative returns occurred in 17 years and in 10 additional years, returns did not exceed $10.00. However, the losses were never large, as the greatest loss was $21.17 in 1952. Losses did not exceed $5.00 in nine of the 17 years of negative returns. The return per dollar of total cost and the return per dollar of feed cost were .0041 and $1.06, respectively. Returns during the full feeding phase were much better and actually made the program return a profit. The full feeding ration contained 15 pounds of grain in addition to protein, alfalfa hay and a small amount of prairie hay. This resulted in an average profit of $18.52 per head. Negative profit occurred in only two years while profits of over $50.00 also occurred in two years. The return per dollar of feed cost was $1.55 while the return per dollar of total cost was .1315.

In summarizing the three phases of Program E, negative profit appears only once, in 1934, which was slightly more than $8.00. The overall average profit was $34.16 per head. Returns of above $20.00 per head occurred in 18 years with eight of these years having returns above $50.00. The greatest profit appeared in 1950 when the figure reached almost $115.00 per head. The overall return per dollar of feed cost was $1.53 and the overall return per dollar of total cost was .2728 or better than a 27 percent return on the entire feeding program.

Program B differed from Program E above in that the steers were full fed on grass, Table 10. The wintering ration included five pounds of grain as did Program E. In addition to the grain, silage, protein, alfalfa hay and prairie hay were fed. Slightly more prairie hay was fed in Program B than in Program E. The average profit for the wintering phase was $13.78, which is somewhat

less than the profit for wintering under Program E. Negative returns occurred in five years and returns above $50.00 were experienced in two years. The return per dollar of feed cost was $1.55 and the return per dollar of total cost was .1667. Profit realized from the grazing season was $1.09 which is very low but still above the profit received under Program E. Negative returns appeared in 15 years as compared to 17 years under Program E. The return per dollar of feed cost and the return per dollar of total cost for the grazing phase were $1.14 and .0104, respectively. The full feeding phase again made the deferred program successful as far as profit is concerned. The average profit realized from the full feeding phase was $18.55, or almost identical to the returns in Program E above. Returns above $50.00 and below zero occurred in two years in each case. The greatest loss was about $6.00 in 1943 while the largest return was more than $62.00 in 1946. The full feeding phase of Program B produced 279 pounds of gain where the steers were full fed on grass, compared to a gain of 269 pounds for the full feeding phase of Program E. The full feeding rations differed only slightly outside of the roughage. Program B received slightly more than 15 pounds of grain in addition to protein and grass. The return per dollar of feed cost was $1.54 while the return per dollar of total cost was .1328.

Combining the three phases of Program B, the average profit was $33.41, with losses occurring in two years and profits above $20.00 appearing in 17 years. The greatest loss as far as the entire program was concerned, occurred in 1934 and was $7.75. The largest profit was $116.11 in 1950. The combined return per dollar of feed cost was $1.50 while the total return per dollar of total cost was .2676.

It would seem to be a matter of indifference as to which method of deferred feeding to follow. The overall profit differed by only 75 cents per head. However, Program E was superior as far as profits were concerned in 22 years of the 31-year period studied. Program B was superior in nine years. On the basis of this, Program E with full feeding in the dry lot was the most profitable of the deferred feeding systems studied.

Deferred Fed Heifers

Deferred feeding of heifers is quite similar to deferred feeding of steers. Heifers are usually fed less grain than steers or they may not receive any grain in the wintering ration. Heifers may also be handled very much like steers in the wintering phase, but then not go to grass. This would then be very similar to a wintering and full feeding program. Another characteristic of a deferred heifer program is that the heifers are normally sold earlier and at lighter weights than steers.

Four different systems of deferred feeding of heifers were budgeted in this study. One program does not include a grazing phase, two other programs do not utilize any grain in the wintering ration, while the fourth program has a wintering ration of two pounds of grain.

Program A does not include a grazing phase. The wintering ration consisted of two pounds of grain in addition to silage, protein and a small amount of prairie hay. Return resulting from the wintering phase was a negative $5.00. Profits of zero to $50.00 occurred in five years with losses appearing in 26 years. The full feeding phase produced a somewhat better return with average profit reaching almost $15.00. Negative returns were realized in five years while returns of above $50.00 occurred in one year. The return per

dollar of feed cost was $1.45 while the return per dollar of total cost was .1395 or 14 percent. In summary, the two phases produced a profit of $9.88 per head. Negative returns were still apparent in 10 years with the main portion of the returns falling in the zero to twenty-dollar-range. The greatest loss, $23.43, appeared in 1936 while the largest gain occurred in 1948, which was $105.82 per head. The overall return per dollar of feed cost was $1.20 while the overall return per dollar of total cost was .0885. The results of Program A appear in Table 11 in the appendix.

System B of deferred heifers was more nearly the type of deferred feeding system considered typical. The wintering ration contained two pounds of grain, protein, silage and prairie hay. The resulting profit was $4.29 per head for the wintering phase. Negative profit appeared in 11 years while returns from zero to $20.00 occurred in 17 years. The return per dollar of feed cost was $1.22 and the return per dollar of total cost was .0537. Returns for the grazing phase resulted in an average loss of $2.12. Negative returns appeared in 19 years with the largest loss occurring in 1952 when the figure reached $34.51 per head. The full feeding ration included slightly more than 14 pounds of grain, protein, prairie hay and a small amount of alfalfa hay. The profit resulting from full feeding was $20.35 per head. Most of the returns fell in the range of $10.00 to $50.00 profit per head. The only loss appeared in 1943 and the figure was $5.51.

In totaling the three phases of Program B, profit per head was $22.52. Negative profit appeared in six years while profit above $50.00 occurred in four years. The largest loss was $15.76 in 1934 and the greatest profit was $108.94 which occurred in 1948. The overall return per dollar of feed cost was $1.38 and the overall return per dollar of total cost was .1844. The results of Program B are shown in Table 12.

Program C differs from the above two systems in that this program did not receive any grain in the wintering ration, but did receive protein during the grazing season. The wintering ration consisted of silage, protein and prairie hay. The results of Program C are presented in Table 13. Profit resulting from wintering was $1.32 per head with negative returns occurring in 14 years and returns between zero and $20.00 in 15 years. The greatest loss was $27.26 which occurred in 1953. Losses exceeded $10.00 in six years. Profits never exceeded $50.00. The return per dollar of feed cost was $1.09, while the return per dollar of total cost was .0176. The grazing phase had a daily ration of .41 pounds of protein in addition to the grass. The grazing season produced a profit of $4.75 per head which was considerably better than the loss realized in the grazing phase of Program B above. The return per dollar of feed cost was $1.50 and the return per dollar of total cost was .0555. The profit resulting from the full feeding phase was $14.13 per head, which was somewhat less than the returns of the two preceeding programs. However, negative returns occurred only during two years, 1925 and 1943. Most of the returns fell in the range of $10.00 to $20.00. The return per dollar of feed cost and the return per dollar of total cost were $1.61 and .1244, respectively. The full feeding ration included about 13 pounds of grain, protein, alfalfa and prairie hay.

Combined, the phases of Program C showed a profit of $20.20 per head on the average. The greatest loss was slightly over $9.00 which occurred in 1936, one of the eight years of negative returns. Profits exceeded $50.00 in five years, the greatest profit being $93.56 in 1948. The total return per dollar of feed cost was $1.43 while the overall return per dollar of total cost was .1882 or about 19 percent.

Program D is similar to C above in that the wintering ration did not include grain. However, no protein was fed during the grazing season. Table 14 shows the results of Program D. The wintering ration consists of protein, silage and prairie hay. This method of wintering produced an average profit of $3.23 per head. During 25 years, returns were either negative or less than $10.00. The largest loss was $24.75 in 1953 while the greatest profit was $38.93, occurring in 1948. The return per dollar of feed cost was $1.21 and the return per dollar of total cost was .0428. The grazing season produced a very low return, as on the average it was only 42 cents per head. Negative returns and returns of less than $10.00 occurred in 27 years with the largest loss appearing in 1952. Profits never exceeded $20.00 in any year. The full feeding ration contained almost 14 pounds of grain per day along with protein, alfalfa hay and prairie hay. The resulting profit was $13.50 which was similar to the returns produced by Programs A and C above. Negative profit was realized in three years with the majority of the returns falling in the zero to twenty-dollar-range. The return per dollar of feed cost and the return per dollar of total cost were $1.42 and .1131, respectively.

Summarizing, the three phases of Program D produced an average profit of $17.15 per head. The combined return per dollar of feed cost was $1.31 and the combined return per dollar of total cost was .1482 or approximately 15 percent. Negative returns occurred in 10 years while profits in excess of $50.00 appeared in four years. The greatest return was $92.71 in 1948 while the greatest loss was $16.66 in 1934.

The most profitable method of deferred feeding of heifers seems to be Program B which was more nearly the typical deferred feeding program.

Program B differed from the other programs in that it contained two pounds of grain per day in the winter ration while two of the other programs received no grain in the wintering phase and the remaining program did not include a grazing phase. Program B was superior as far as profits were concerned in 26 years of the 31-year period, Program C was superior in six years, Program A was superior in one year while Program D was never superior. According to this it would appear that a profitable deferred feeding program of heifers should include a wintering ration of grain.

Full Fed Steers

Full feeding is well adapted to areas where an abundance of feed grain is produced and pasture is limited. Northeast Kansas fits these qualifications, therefore making it well suited for full feeding. The full feeding program as a phase in itself differs somewhat from the full feeding phase in deferred feeding or grazing and full feeding. Full feeding programs are usually carried out for a much longer period of time than the full feeding phase of some other programs. Normally, better quality animals are used for full feeding as well as lighter weight cattle in an attempt to reduce or lessen financial hazards. However, heavier weight steers were budgeted as well as lighter weights. The results of the study of lighter steers are shown in Tables 15 and 16, while the results of the heavier steers are presented in Tables 17, 18 and 19. All of the programs studied were full fed in the dry lot.

Program A began in December and continued through to July. Good to choice grade calves of slightly over 400 pounds were used. The daily ration included slightly more than 11 pounds of grain, silage, protein, alfalfa and prairie hay. The average return, after feed and animal cost were taken from

the selling value, was $36.65 per head. Returns of less than zero occurred in two years, 1930 and 1936. The largest loss was $16.77 in 1936. Profits above $50.00 were realized in eight years with the largest return, $154.07 per head, in 1948. Returns of above $20.00 occurred in 22 years of the 31-year period studied. The return per dollar of feed cost was $1.67 and the return per dollar of total cost was .3061. Program A produced choice to prime fat steers, weighing nearly 900 pounds at the end of the feeding.

Program C was a summer full feeding program with good to choice grade steers being used. Their beginning weight was slightly over 600 pounds when feeding began in July. After 137 days of feeding, the calves graded mostly choice with a few steers grading prime, and weighing 928 pounds. The full feeding ration consisted of 16 pounds of grain, protein and prairie hay. Profit per head averaged $27.36 while the return per dollar of feed cost was $1.60 and the return per dollar of total cost was .2001, which is considerably less than in Program A above. Negative returns appeared in two years, while most of the returns fell in the range of $10.00 to $50.00 per head. Profit of above $50.00 occurred in six years with the greatest return occurring in 1949. This return was $99.70 per head.

System D was of the winter full feeding type as Program A. In this case good grade steers of 500 pounds were used. They were fed 14 pounds of grain and almost seven pounds of alfalfa hay daily for 203 days and gained 446 pounds to grade mostly choice, however, 10 percent graded prime and 20 percent graded good. The profit realized from Program D was $37.48 per head, for the best return of the five full feeding programs of lighter weights studied. However, negative returns appeared in three years with the greatest loss being $20.48 in 1936. The largest gain, $150.31, occurred in 1948. The return per

dollar of feed cost and the return per dollar of total cost were $1.69 and .3081, respectively.

Good to choice grade steers of 500 pounds were used in Program 21. The daily ration consisted of two feeds, 14 pounds of grain and five pounds of alfalfa hay. No protein or additional roughage was fed. After 203 days of full feeding, the steers graded choice and weighed 933 pounds. The average profit per head was $36.81. Negative returns occurred in three years while returns above $50.00 occurred in eight years. The greatest return was $151.40 in 1948 and the largest loss was $20.08 in 1936. The return per dollar of feed cost was $1.70 while the return per dollar of total cost was .3033.

Full feeding Program 19 received a daily ration of 11 pounds of grain and 12 pounds of alfalfa hay. Good to choice grade steers weighing 500 pounds were fed for 203 days beginning in December and ending in July. After full feeding for this period, the steers graded mostly choice and gained 432 pounds per head. The profit realized per head was $33.81 with losses occurring in four years, the largest loss being $19.37 in 1936. Returns of above $20.00 per head occurred in 23 years with the greatest gain, $145.87, appearing in 1948. The return per dollar of feed cost and the return per dollar of total cost were $1.64 and .2788, respectively.

The following 12 feeding programs deal with steers of heavier weights. The steers used in Programs 15 through 18 weighed approximately 750 pounds and graded choice. All four programs began in October and continued to April for a 180-day feeding period. Program 15 was fed a daily ration of 14 pounds of grain, silage and protein. The resulting profit was $32.16 per head while the return per dollar of total cost was .1949. Returns of over $20.00 per head were realized in 18 years with the largest return being $111.82 in 1951.

Two years later the greatest loss occurred, being $21.51. Losses appeared in only three years of the 31-year period.

Program 16 was similar to Program 15 above except that the relative amounts of the feeds fed differed. The daily ration included nine pounds of grain, protein and a considerable amount of silage. This was a reduction in the grain as compared to Program 15 and an increase in silage. At the completion of the feeding period, the steers weighed over 1,000 pounds and graded largely choice. The average profit realized from Program 16 was $31.47 per head. The largest portion of the annual returns was above $20.00 with nine years above $50.00. Negative returns were realized in three years, 1934, 1936 and 1953. The average return per dollar of feed cost was $1.67 and the return per dollar of total cost was .1990 or 20 percent.

The daily ration fed to the steers in Program 17 had an increased amount of silage and a reduction in grain. Less than five pounds of grain were fed daily and at the end of the feeding period all of the steers had dropped from choice at the beginning to good. The profit resulting from Program 17 was $24.28 per head with annual returns appearing as negative in five cases. The largest loss was almost $33.00 in 1953. The return per dollar of feed cost was $1.67, the same as Program 16 above, and the return per dollar of total cost was .1633.

The daily ration of Program 18 did not include grain, but consisted of 45 pounds of silage in addition to protein. After 180 days of feeding, the steers had dropped from choice at the start to mostly commercial. The steers gained slightly less than one pound per day. As a result of an almost entire roughage ration, profit was the lowest of the 17 full fed steer programs studied. The average profit was only $3.19 per head for the 31-year period.

Negative returns occurred in 15 years with the greatest loss, $61.98, appearing in 1953. The average return per dollar of feed cost was $1.13 while the average return per dollar of total cost was .0236.

At the beginning of the feeding in Programs 22 through 25, the steers weighed approximately 800 pounds and graded good. All four programs began in August and ended in January, making a feeding period of 150 days. Program 22 had a daily ration of almost 13 pounds of grain along with protein, silage and alfalfa hay. The steers in Program 22 gained 390 pounds and produced an average profit of $15.90 per head. They graded largely good with a small portion grading choice. Losses were produced in 11 years of feeding while profits of above $50.00 occurred in five years. The majority of the annual returns fell in the zero to twenty-dollar range. The average return per dollar of feed cost was $1.30 and the average return per dollar of total cost was less than 10 percent.

The average profit resulting from full feeding in Program 23 was $19.92 per head. Negative returns occurred in nine years with the largest loss, $19.93, appearing in 1934. The greatest annual profit was realized in 1948 and was over $96.00. The return per dollar of feed cost and the return per dollar of total cost were $1.37 and .1217, respectively. The steers in Program 23 received a daily ration of 14.5 pounds of grain besides protein, silage and alfalfa hay. At the completion of the feeding program, the steers had gained 405 pounds and graded mostly good and partially choice.

The steers in full feeding Program 24 received almost 18 pounds of grain in addition to silage, protein and alfalfa hay in a daily ration. The steers gained 443 pounds and graded largely choice. The average annual profit realized from Program 24 was $34.27, one of the higher returns of full fed steers.

Returns of above $20.00 occurred in 17 years with the largest return being $125.07, in 1948. Losses appeared in only three years. The average return per dollar of feed cost was $1.58 while the return per dollar of total cost was .2037 or slightly over 20 percent.

A daily ration of about 18 pounds of grain, silage, protein and alfalfa hay was fed to the steers in Program 25, which began in September. At the completion of the feeding period in February, the steers had gained 392 pounds and graded good to choice. The resulting profit was the third lowest of the 17 programs studied. The average profit was $12.88 with losses occurring in 11 years. The greatest loss was almost $35.00 in 1953. However, annual profits exceeded $50.00 in five years with the largest gain appearing in 1951. The average return per dollar of feed cost and the average return per dollar of total cost were $1.21 and .0730, respectively.

Steers weighing around 800 pounds were used in the full feeding programs of I, II, III and IV. The beginning grades and the lengths of feeding varied somewhat. The steers of Program I graded good to choice at the onset of the feeding period in August. They received a daily ration of almost 17 pounds of mixed grains in addition to prairie hay and protein. After a feeding period of 110 days, the steers had gained 279 pounds and graded mostly good. The average profit realized from Program I was $11.33 per head with losses occurring in eight years. The losses never exceeded $18.00 in any year, however, gains rarely exceeded $50.00. The return per dollar of total cost was .0748 while the return per dollar of feed cost was $1.29.

Program II began in November and continued through April for a feeding period of 150 days. The steers used graded choice at the beginning and at the end of the period and gained 365 pounds while on feed. The steers were fed

slightly more than 13 pounds of grain, 40 pounds of silage and protein. The average profit resulting from the above ration was $37.41, the third largest average profit realized of the 17 programs. Annual returns were above $20.00 per head in 22 years and above $100.00 in two years. The return per dollar of feed cost was $1.69 and the return per dollar of total cost was .2127.

Program III produced the largest average profit of the 17 full fed steer programs studied. Profit reached $37.75 per head. Negative profit appeared in only two years, 1936 and 1953, while profits of over $50.00 occurred in nine years. In 1950 and 1951, profits exceeded $110.00 per head. The return per dollar of feed cost was $1.72, also the highest of all 17 programs, while the return per dollar of total cost reached almost 22 percent. The daily ration for Program III included 13.7 pounds of grain, 41.6 pounds of silage and protein. The feeding period began in November and lasted for 150 days. The steers graded mostly choice at the start of the feeding period and graded choice to prime at the completion.

Program IV was the final method of full fed steers studied. Program IV began in September with good grade steers and was completed in January with the steers grading good to choice. The steers put on a gain of 372 pounds and produced an average profit of $26.69 per head from a daily ration of almost 17 pounds of grain, silage, protein and alfalfa hay. The majority of the annual profits were above $20.00 per head with the largest profit being $104.28 in 1948. Losses also appeared in four years, the greatest loss being $16.00 in 1934. The return per dollar of feed cost and the return per dollar of total cost were $1.50 and .1610, respectively.

When reviewing all 17 programs of full fed steers, Program III of the heavier weights produced the greatest average annual profit. This figure was

$37.75. The steers in Program III were fed a very heavy silage ration along with moderate amount of grain. Since these steers weighed well over 800 pounds at the start, they could utilize the heavier roughage ration better than steers of lighter weight. The second largest profit came from Program D of the lighter weights. This group of steers produced an average profit of $37.48 from a daily ration of 14 pounds of grain and about seven pounds of alfalfa. The third highest return, $37.41, was produced by Program II, again of the heavier weight steers. Program II was similar to Program III above as far as daily ration and beginning weights were concerned.

In determining which program was superior relative to annual profits, it was found that Program C was superior to all other programs. During six years, Program C produced the greatest amount of profit of the 17 programs studied. However, the average annual profit realized from Program C was only $27.36, some $10.00 less than the profit produced by Program III. Following Program C was Program II which was superior in five years. Programs III and 24 were superior in four years each, while Programs D and 21 were superior in three years. Programs A, 15, and 17 were superior in two years.

When considering only the steers of heavier weights, Program III was superior in nine years, followed by Program II with seven years and Program 24 with six superior years.

Program C was superior in 10 years when the lighter weight steers were considered. Program D was superior in nine years, Programs 21 and A were superior in five years, and Program 19 was superior in two years.

Full Fed Heifers

Full feeding heifers is similar to the full feeding of steers except that heifers are normally fed for a shorter period of time for a lighter weight than steers. Since heifers can usually be purchased cheaper than steers, the capital input per head is lower, and since they are not fed as long as steers, the turnover is more rapid.

Sixteen different programs were studied using different lengths of feeding periods, different beginning weights and various quantities of feed. Most of the programs were initiated in April and May except Programs F and G, which began in November. The heifers used were of good to choice grades in most cases. Eight programs were budgeted for heifers under 600 pounds as well as eight programs utilizing heifers weighing over 600 pounds. The results of full feeding heifers are found in Tables 20, 21, 22 and 23.

The heifers studied in Program E graded good and weighed 543 pounds at the onset of the program. They were fed 12 pounds of grain besides prairie hay and protein in the daily ration. Feeding began in July and continued until December when the heifers graded good to choice and weighed 834 pounds. Program E produced an average profit of $17.40 per head while the return per dollar of feed cost and the return per dollar of total cost were $1.43 and .1626, respectively. Negative returns occurred in four years with the greatest loss, $7.18, appearing in 1937. Most of the returns occurred in the zero to twenty-dollar-range while returns of above $50.00 were realized in two years.

Program F was a lengthy feeding period, lasting 208 days, beginning in November and ending the following June. The heifers in Program F were of good

to choice grades weighing 386 pounds at the start. The heifers gained 364 pounds during the feeding period and graded mostly choice at the end. The average profit realized from the program was $14.93 per head with negative returns occurring in five years and returns of above $50.00 per head in two years. The return per dollar of feed cost was $1.31 and the return per dollar of total cost was .1467. The heifers were fed nine pounds of grain daily in addition to silage, protein, alfalfa and prairie hay.

The full fed heifers in Program G were fed 9.5 pounds of grain per day along with silage, protein, alfalfa and prairie hay. Program G was also a long feeding program continuing for 208 days. The profit realized was $18.27 per head with the majority of the profit figures falling in the ten to fifty-dollar-range. This area accounted for 17 years of the 31 years under consideration. The return per dollar of feed cost was $1.35 and the return per dollar of total cost was .1565. The heifers graded good to choice and weighed 467 pounds at the start of the feeding period. At the conclusion, they weighed 862 pounds and also graded good to choice.

Program H lasted one-half as long as Programs F and G above. The heifers graded good in April at the start and mostly good with a few head grading choice in July. A gain of 202 pounds was realized from the feeding of 12 pounds of grain daily along with alfalfa hay, prairie hay, silage and protein. The profit realized was $18.27 per head while the returns per dollar of feed cost and the returns per dollar of total cost were $1.40 and .1146, respectively. Negative profit occurred in six years with the largest loss, $9.04, appearing in 1936. The largest return was almost $80.00 in 1948.

The daily ration fed to Program 7 included 13 pounds of grain and 7.5 pounds of alfalfa hay. After 154 days in the feed lot, the heifers weighed

807 pounds and graded good to choice. The return above feed and animal cost was $12.05, the fourth lowest of the 16 full feeding heifer programs studied. Negative returns occurred in six years with the greatest loss appearing in 1934. Returns from zero to $20.00 were realized in 18 years. The return per dollar of feed cost was $1.33 and the return per dollar of total cost was .1145.

The heifers in Program 8 received a daily ration of 14 pounds of grain and six pounds of alfalfa hay. Heifers of good to choice grades weighing 510 pounds were used in the program which began in May and continued through October. At the completion of the feeding period the heifers weighed 815 pounds and graded good to choice. Profit realized per head was $16.43 while the returns per dollar of feed cost and the returns per dollar of total cost were $1.40 and .1517, respectively. Returns from $10.00 to $50.00 were realized during 20 years.

Heifers of good to choice grades weighing 515 pounds were used in Program 9. The full feeding ration included 15 pounds of grain and five pounds of alfalfa hay daily. The profit realized after 154 days of feeding was $25.86 per head, which was the second largest return of the 16 programs studied. The return per dollar of feed cost was $1.62 and the return per dollar of total cost was .2350. Returns were negative for five years while returns of above $50.00 appeared in four years. The largest return was $86.87 in 1948 and the greatest loss was $7.49 in 1925.

Program 10 completes the study of lighter weight full fed heifers. The heifers in this program graded good to choice and weighed 518 pounds at the start. By October, they graded mostly choice and had gained 315 pounds. The daily ration consisted of 13 pounds of grain and 7.5 pounds of alfalfa hay.

The average profit realized was $21.73 per head while the return per dollar of feed cost was $1.55 and the return per dollar of total cost was .2012.

The heifers that were full fed in the programs to follow are of heavier weights. Programs 3 through 6 utilized heifers weighing approximately 640 pounds and grading good to choice at the beginning of the feeding program, which continued for 91 days. The heifers in Program 3 were fed 11.4 pounds of grain and 11.5 pounds of alfalfa hay per day. This method of full feeding produced an average return of $6.90 per head for the poorest return of all 16 programs. This return is probably due to the rather high roughage to grain ratio used. Negative returns occurred in 10 years with the greatest loss being $10.32 in 1943. Profits were either negative or below $20.00 per head in 29 years. The return per dollar of feed cost was $1.27 while the return per dollar of total cost was .0627.

Fourteen pounds of grain and six pounds of alfalfa hay made up the daily ration fed to the heifers in Program 4. At the completion of the feeding, the heifers graded good to choice and weighed 818 pounds for a gain of 179 pounds. The average profit realized was $13.96 per head with negative profit occurring in only four years. Most of the returns fell in the range of zero to $20.00 per head. In 1948, the largest profit of nearly $70.00 per head was realized. The return per dollar of feed cost was $1.53 and the return per dollar of total cost was .1255.

The profit resulting from Program 5 was $18.61 per head. The heifers gained 213 pounds and graded mostly choice at the completion of the feeding program in August. The daily ration included almost 16 pounds of grain and 5.6 pounds of alfalfa hay. Negative returns appeared in three years while most of the returns fell in the ten to fifty-dollar-range. The returns per dollar

of feed cost was $1.64 while the returns per dollar of total cost was .1642.

The heifers in Program 6 received a daily ration of 12 pounds of grain and eight pounds of alfalfa hay. At the end of the feeding period, the heifers weighed 800 pounds and graded mostly good. The profit per head on the average was only $10.10, with negative profit appearing in six years. The largest loss was $8.21 in 1943 while the greatest profit was $57.56 in 1948. During 19 years, profits fell within the range of zero to $20.00 per head. The return per dollar of feed cost and the return per dollar of total cost were $1.42 and .0929, respectively.

Programs 11 through 14 contained heifers weighing approximately 710 pounds at the beginning of the 125 day feeding period. At that time, the heifers graded good to choice. The heifers in Program 11 received a daily ration of 13.3 pounds of grain and 13.3 pounds of alfalfa hay. By September, the full fed heifers weighed 987 pounds and graded mostly choice. The average profit realized from Program 11 was $22.92 per head with returns of over $50.00 occurring in four years. The greatest return was $95.00 occurring in 1948. Most of the returns fell in the ten to fifty-dollar-range. The return per dollar of feed cost was $1.60 while the return per dollar of total cost was .1735.

Program 12 returned the largest profit of the 16 full feeding heifer programs studied. Profit averaged almost $26.00 per head. The heifers in Program 12 were fed a daily ration of 16.8 pounds of grain and 5.9 pounds of alfalfa hay. The feeding resulted in a 275 pound gain per heifer which graded mostly choice at the end of feeding. The return per dollar of feed cost was $1.69 and the return per dollar of total cost was .1968 or almost 20 percent.

A gain of 290 pounds was realized from Program 13. This group of heifers received 18.3 pounds of grain and 4.2 pounds of alfalfa hay in a daily ration. At the completion of the feeding period, the heifers weighed about 1,000 pounds and graded good to choice. The profit realized from Program 13 was $17.36 per head while the return per dollar of feed cost was $1.44 and the return per dollar of total cost was .1313. Negative profit appeared in six years with the greatest loss, $17.29, in 1943. In three years, profits of over $50.00 were realized, the largest return being $78.64 which occurred in 1948.

The daily ration fed to the heifers in Program 14 included 17.3 pounds of grain and 8.2 pounds of alfalfa hay. The final weight was 995 pounds after gaining 290 pounds during the feeding period. The heifers graded good to choice and returned an average profit of $16.07 per head. Negative returns appeared in seven years while most of the returns fell in the ten to fifty-dollar-range. The return per dollar of feed cost was $1.39 and the return per dollar of total cost was .1198, or about 12 percent.

When reviewing all 16 feeding programs, Program 12 appears to be the most profitable. This group of heavier heifers received 17 pounds of grain and six pounds of alfalfa hay daily. Although the heifers in this group did not gain as many pounds as other programs, they did grade better than most programs. Program 9 produced the second largest profit on a daily feed of 15 pounds of grain and five pounds of alfalfa hay. The heifers of group 9 were in the lighter weight class, under 600 pounds.

To determine which program was superior relative to average profit, all 16 programs were compared as one group. In this comparison, Program 12 was superior in nine years, Program 9 was superior in eight years while Program G was superior in five years. Programs E, 5, 11 and 14 were superior in four,

three, one and one years, respectively. When only the eight lighter programs were considered, Program 9 was superior in 18 years, while Programs E and G were superior in six years each. Program H was superior in one year. One rather apparent characteristic of full feeding heifers was that they did not lose as much money when returns were negative as full fed steers. This was apparently due to the somewhat lighter rations of grain and the lower cost of heifers.

Cow Herd

Four different methods of handling cow herds were budgeted for the purpose of this study. All programs consist of a six month grazing period and a six month wintering period. The only difference in this respect was the different kinds and quantities of feed fed during the wintering period. The total feed fed was calculated on a per calf basis to allow for cows not producing a calf and for bulls. The factor used was 1.10. The product of the cow was the selling value of a good to choice 425 pound calf at weaning time in November. The returns from the cow herds are presented in Table 24.

The cows under Program A received a wintering ration of alfalfa hay, prairie hay and a small amount of grain. Due to the grain, this method was more costly and produced the smallest return above feed cost. The average profit was $22.10 with negative returns occurring during five years. The greatest loss was $18.33 in 1934 while the largest profit was $105.70 in 1950. The majority of the returns fell in the ten to fifty-dollar-range. The return per dollar of total feed cost was .5189.

The feed ration of Program B of the cow herd was composed of prairie hay and a protein supplement. Due to the prairie hay in the ration, the return or profit for this group was not large. The figure was $24.38. Negative returns appeared in three years while returns of above $50.00 occurred in four years. The largest return was $108.44 in 1950 while the smallest return was a negative $11.58 in 1934. The return per dollar of total feed cost was .6047.

Program C received a ration of alfalfa hay and silage. This particular program was used in budgeting the returns from the cow herd-creep fed calves as it was assumed that this method of handling was more typical for Northeast Kansas. The average annual return per cow was $25.26 with the greatest return appearing in 1950. The most negative return was $16.45 in 1934. Negative returns occurred in four years while profits of above $20.00 occurred in 15 years. The return per dollar of total feed cost was .6405.

Program D returned the largest return which was $26.98 per cow. The cows in this program received a ration of silage, prairie hay and protein. Negative returns occurred in only two years, 1934 and 1936. The largest loss was $11.67 in 1934. Returns of above $20.00 appeared in 16 years with the largest return occurring in 1950 when the figure exceeded $113.00 per cow. Since the average annual profit was highest of the four cow herd systems budgeted, so was the return per dollar of total feed cost. The figure was .7155.

Program D appears to be the most profitable method of handling cow herds as the average annual profit is the largest of the cow herds studied. When all four programs are reviewed to determine the most superior program relative to profit, Program D was found to be superior in 22 years. Program C was superior in five years, Program B was superior in four years while Program A was never superior.

Cow Herd - Creep Fed Calves

Producing creep fed calves is an intensive system of producing beef. It is well adapted to areas where some grain and pasture are available. It appears that this system can be profitably used where herds are small and the cost of keeping cows is relatively high. Creep fed calves are normally sold at about 12 to 14 months of age weighing between 800 and 900 pounds. Three systems were studied using spring calves while eight systems were studied using fall calves. Usually the fall calves are fed for a longer period of time. Of the 11 systems studied, four systems were not creep fed, but were full fed after weaning. Of the seven actual creep feeding programs, different levels of creep feeding and different combinations of feeds fed during creep feeding were studied. Also, included in the cost of creep feeding was the cost of the cow feed times 1.10 to allow for the cost of feeding cows not producing a calf and bulls.

The cows were fed 2.48 tons of silage and 1.10 tons of alfalfa in addition to six months of pasture annually. In all of the programs studied, the cost of pasture for the calves before weaning was included in the total feed cost. All cost and return figures to follow are per calf rather than being separated as to sex. The feed costs and the returns for the cow herd are presented in Table 24 while the returns for the cow herd-creep fed calf systems are shown in Tables 25, 26, 27 and 28.

Programs a, b and c are spring reared calves and of these systems, Program c was not handled as a creep feeding program. The calves in Program a were fed 1.64 pounds of grain per day during the creep feeding phase. Following the creep feeding phase and during the fattening phase, the calves

received almost 13 pounds of grain, 18 pounds of silage, protein, ground alfalfa and alfalfa hay as a daily ration. The calves were born in April and fed for 376 days. At this time, they weighed 857 pounds and graded mostly choice with a few head grading prime. After all feed costs, including the cost of cow feed, were taken from the selling value of the calf, an average annual profit of $37.20 remained. During the 31-year period studied, negative returns occurred in three years while returns of above $50.00 were realized in seven years. Returns of above $20.00 occurred in 21 years. The largest loss was $33.83 in 1934 while the largest return was $151.37 in 1951. The return per dollar of total feed cost was .3729 or approximately 37 percent.

Program b differed from Program a in that the daily ration for Program b included one-fourth pound of protein along with 1.24 pounds of grain. During the fattening phase, the daily ration contained almost 13 pounds of grain, slightly over 18 pounds of silage, protein, ground alfalfa and alfalfa hay. After 377 days of feeding, the calves weighed 880 pounds and again graded mostly choice and partially prime. The average annual return above feed cost was $41.02 or about $4.00 greater than the profit realized from Program a. Returns above $20.00 occurred in 24 years with negative returns appearing in three years. The greatest return was $160.19 in 1951 while the largest loss was $32.23 in 1934. The return per dollar of total feed cost was .4091, or about 41 percent.

No feed was fed while the calves of Program c were on the cows. After weaning the calves were fed 12.6 pounds of grain, 18.75 pounds of silage, protein and ground alfalfa as a daily ration. Since this group of calves were not fed as a creep fed system, they were fed longer during the fattening

phase. When the calves were 13 months old, they weighed 863 pounds and graded mostly choice and partially good. The average annual profit realized from Program c was $38.00 which is above the return produced by Program a and below the return produced by Program b. Profits were negative in three years with the largest loss being $33.01 in 1934. The largest return was $154.15 occurring in 1951. This was one of seven years when profits exceeded $50.00 per head. The return per dollar of total feed cost was .3899.

The following creep fed programs utilize fall calves rather than spring calves as in Programs a, b and c. Program d had a creep fed ration of 4.13 pounds of grain per day. During the fattening phase, a daily ration of slightly more than 11 pounds of grain, 24 pounds of silage, protein and alfalfa hay were fed. After 288 days of creep feeding and 112 days of fattening the calves weighed 895 pounds and graded 75 percent choice and 25 percent good. They were sold in October, a date which was somewhat earlier than the spring calves were sold. Program d produced an average annual profit of $49.99 per head with losses appearing in three years. The greatest loss was $24.45 occurring in 1934. The largest profit occurred in 1948 when profits were slightly more than $157.00 per head. Profits of over $20.00 were experienced in 24 years with profit exceeding $150.00 in three years. The return per dollar of total feed cost was over 52 percent.

The calves in Program e were fed a daily ration of 3.16 pounds of grain and .65 pounds of protein during the creep feeding phase. Later, in the fattening phase, they were fed 11.3 pounds of grain, 22.9 pounds of silage, protein and alfalfa hay as a daily ration. At the end of the feeding in October the calves weighed 870 pounds and graded about two-thirds choice and one-third good. The 395 day feeding period produced an average annual profit

of $43.83 per head. Profit exceeded $50.00 in nine years while losses were recorded during three years. The largest return was $152.37, in 1948, while the return per dollar of total feed cost was .4521.

No feed was fed during the normal creep feeding period in Program f as was found in Program c above. Yet this program produced the greatest return of the 11 programs studied. After the calves were weaned, a feeding program began which continued for 155 days. The daily ration consisted of 11 pounds of grain, 25 pounds of silage, protein and alfalfa hay. At the end of the fattening phase in December, the animals weighed 885 pounds and graded choice. The average profit was $59.04 per head. Only once did a loss occur and that was $12.07 in 1934. At the other extreme, the greatest return was $190.54 in 1950. Returns of above $50.00 occurred in 14 years while returns of above $100.00 per head were realized in six years. The return per dollar of total feed cost was also very high, slightly over 66 percent.

Program g was a normal creep feeding program having a daily ration of four pounds of grain for the creep feeding period. During the fattening period, 14 pounds of grain, four pounds of ground alfalfa and slightly more than five pounds of silage were fed daily. After 278 days of creep feeding and 110 days of fattening, the animals weighed 821 pounds and graded mostly choice with a few head grading good and prime. The average annual profit was $47.26 per head while the return per dollar of total feed cost was .5088. Losses were recorded during three years with the largest loss, $22.83, in 1934. The greatest return was realized in 1948 and was $162.88. Profit exceeded $50.00 per head in 11 years.

Program h was similar to Programs c and f above in that no feed was fed before weaning. A daily ration of 12 pounds of grain, nine pounds of silage

and four pounds of ground alfalfa were fed during the 148 days of the fattening phase. By December the animals weighed 824 pounds and graded mostly choice. As in Program e above, a loss was recorded in only one year, this loss being $14.73 in 1934. However, returns of above $50.00 occurred in only nine years as compared to 14 years in Program f. The average annual profit was $49.70 while the return per dollar of total feed cost was 60 percent.

For creep feeding Program i, a daily ration of 3.66 pounds of grain was fed during the feeding period which continued for 284 days. During the 121 day fattening period, a daily ration of 13 pounds of grain, 18 pounds of silage and protein were fed. By November, the steers and heifers graded 73 percent choice and 27 percent good and weighed 850 pounds. The resulting average annual profit was $40.76 per head and the return per dollar of total feed cost was .4180. Losses occurred in four years with the greatest loss, $27.60, appearing, as for the other alternatives, in 1934. At the other extreme, the largest profit was $145.87 in 1950. Profits exceeded $100.00 in four years and $50.00 in nine years.

The creep feeding ration of Program j included 3.13 pounds of grain and .64 pounds of protein daily. The creep feeding period lasted for 282 days and was followed by a fattening period of 121 days. The daily ration fed during the fattening phase was composed of 13 pounds of grain, 17 pounds of silage, and protein. By November, the animals of Program j weighed 870 pounds and graded three-fourths choice and one-fourth good. The profit realized from this group was $41.14 per head. Losses appeared in four years and profits of above $50.00 occurred in nine years. The return per dollar of total feed cost was .4085 or almost 41 percent.

Program k produced the second largest return of 11 programs of creep feeding studied. Again, as in Programs c, f and h above, no feed was fed until after the calves were weaned. During the fattening period, the calves in Program k were fed a daily ration of 12.57 pounds of grain, 21.61 pounds of silage, and 1.38 pounds of protein. After 121 days of feeding the animals weighed 841 pounds which was only slightly less than the weights of animals from creep feeding Programs i and j. The animals graded 58 percent choice and 42 percent good and yet produced an average annual profit of $51.41 per head. Even though this group did not grade as high as other groups, the low cost of feed apparently accounted for the difference in profit. As in Programs f and h above, losses occurred in only one year, the loss being $17.21 in 1934. Returns of above $50.00 were recorded in 24 years while returns of above $100.00 appeared in four years. The largest return was $160.15 in 1950. The return per dollar of total feed cost was 63 percent.

Program f appears to have been the most profitable method of feeding calves during the period 1925 to 1955. Program f is a non-creep fed system in which the calves received no feed other than milk and pasture until weaning. The second most profitable program was system k, which was also a non-creep fed system. This would seem to indicate that the feed fed was better utilized when the calves were older. Also in most cases, the feed cost was lower for non-creep fed animals than for creep fed animals.

When all 11 programs were reviewed to ascertain the most superior program relative to profits, Program f was found to be superior in 23 years. Programs b and g were superior in four years each, while none of the remaining programs were superior. When the non-creep fed systems were omitted, Program d was superior during 16 years, Program b was superior in seven years, Program g was

superior in six years while Program j was superior in two years. Program d of the creep fed systems received a daily ration of over four pounds of grain during the creeping phase. Omitting the spring raised calves of Programs a, b and c and considering the remaining eight programs, Program f was again the most profitable program, having been superior in 26 years.

Summary

This study was concerned with the production of beef cattle in Northeast Kansas and an attempt to determine the most profitable beef feeding program for that area. The study was of time series nature, covering a period from 1925 to 1955. The budgeting process was used to determine annual costs and returns for the various beef cattle feeding programs.

As indicated in Table 29, the cow herd-creep fed calves consistently returned the largest profit per head. However, this may be somewhat erroneous since no charge was included for the replacement of the cow. Of the remaining systems, full fed steers of lighter weights appeared to be the most profitable, with an average annual return of over $30.00 in most cases. The returns of the heavier full fed steers appear to be more erratic, especially for certain rations. However, this group also produced large returns.

Deferred fed steers also produced an average annual profit of over $30.00 per head. However, the profit was still somewhat lower than for full fed steers of lighter weights. One rather striking characteristic of deferred fed steers was the low loss figure as compared to the rather large loss figure of the full fed steers and creep fed calves. This characteristic was also apparent in the full feeding of heifers, in that they did not usually lose as much money as the full fed steers or creep fed calves, but neither did they return as great an average profit as full fed steers.

Wintered and grazed steers produced a rather moderate profit figure but appeared to have the highest return per dollar of feed cost. This was apparently due to the low cost gains from pasture. Wintered steers also produced a rather large return per dollar of feed cost even though the profit from this group was among the lowest. This was probably due to the rather low cost of feeds used in wintering.

In comparing the various systems in regard to returns per dollar of total cost, the creep fed calves produced the greatest return. The returns varied from 38 percent up to 66 percent which was greater by far than the returns of any of the other systems. Following the creep fed calves, the lighter weight full fed steers returned the next greatest return per dollar of total cost. Following the creep fed calves and full fed steers were deferred fed steers and wintered and grazed steers.

Based on the findings of this study it can be assumed that creep fed calves, full fed steers of lighter weight, and deferred fed steers were the most profitable beef feeding programs during the period of 1925 to 1955. It is not necessarily implied that these particular feeding programs would be the most profitable at the present time or in the future.

Findings have indicated that creep fed calves, full fed steers of lighter weights and deferred fed steers have in the past been most profitable. However, due to the lack of complete information concerning beginning and ending grades, large discrepancies in profits could be apparent which could possibly cause a considerable shift in the findings.

Another limitation involved in this study concerned the returns of the cow herd-creep fed calves as not all of the actual costs were included due to a lack of information.

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APPENDIX

Table 1. Feed fed, costs and returns for wintering steers B, C, D and E.

Program and no. days	B (147)	D (133)	C (124)	E (124)
Number head	10	47	40	40
Daily Ration: (lbs.) silage	—	29.54	38.88	30.31
Prairie hay	12.11	—	—	—
Ground alfalfa	—	—	—	5.00
Milo	—	3.96	1.75	1.75
Cottonseed meal	—	—	1.25	—
Soybean oil meal	1.00	1.00	—	—
Total Feed: silage (tons)	—	1.97	2.30	1.77
Prairie hay (tons)	.89	—	—	—
Ground alfalfa (tons)	—	—	—	.31
Milo (bu.)	—	9.41	3.88	3.88
Cottonseed meal (cwt.)	—	—	1.55	—
Soybean oil meal (cwt.)	1.47	1.34	—	—
Value of Feed: ($) silage	—	8.76	10.24	7.88
Prairie hay	8.91	—	—	—
Ground alfalfa	—	—	—	5.10
Total roughage	8.91	8.76	10.24	12.98
Milo	—	8.11	3.34	3.34
Total grain	—	8.11	3.34	3.34
Cottonseed meal	—	—	4.66	—
Soybean oil meal	4.59	4.18	—	—
Salt and minerals	—	.12	—	—
Total commercial feed	4.59	4.30	4.66	—
Total all feed	13.50	21.17	18.24	16.32
Beg. ph.: wt. (lbs.)	521	422	485	486
Grade (%)	50 Ch, 50 Gd	50 Ch, 50 Gd	50 Ch, 50 Gd	50 Ch, 50 Gd
Price ($/cwt., mo.)	15.58, Nov.	15.58, Nov.	15.58, Nov.	15.58, Nov.
Cost animal ($)	81.19	65.68	75.62	75.66
Cost animal, feed ($)	94.69	86.85	93.86	91.98
End. ph.: wt. (lbs.)	653	660	682	701
Grade (%)	100 Ch	100 Ch	50 Ch, 50 Gd	50 Ch, 50 Gd
Price ($/cwt., mo.)	16.01, Apr.	16.01, Apr.	15.32, Mar.	15.32, Mar.
Value animal ($)	104.53	105.65	104.47	107.38
Gain (lbs.)	132	238	197	215
Feed cost/cwt. gain ($)	10.23	8.88	9.27	7.58
Value-cost animal ($)	23.34	39.97	28.85	31.72
Value-c-value comm. feed ($)	18.75	35.67	24.19	—
Value-c-c-value grain ($)	—	27.56	20.85	28.38
Value-c-c-g-value rough. ($)	9.84	18.80	10.61	15.40

Table 1. (conc'l.)

Program and no. days	B (147)	D (133)	C (124)	E (124)
No. years returns negative	7	1	6	6
" " " $ 0 - $10	9	10	13	7
" " " $10 - $20	10	6	8	11
" " " $20 - $50	4	11	3	5
" " " above $50	1	3	1	2
Returns/$ feed cost	1.73	1.89	1.58	1.94
Returns/$ total cost	.1039	.2165	.1130	.1674

Table 2. Feed fed, costs and returns for wintered and grazed steers, A, 31 head.

Phase and no. days	Winter (147)	Graze (151)	Total (298)
Daily Ration: (lbs.) silage	26.35	--	--
Soybean oil meal	1.00	--	--
Total Feed: silage (tons)	1.92	--	1.92
Soybean oil meal (cwt.)	1.47	--	1.47
Value of Feed: ($) silage	8.55	--	8.55
Pasture	--	7.82	7.82
Total roughage	8.55	7.82	16.37
Soybean oil meal	4.60	--	4.60
Salt and minerals	.19	--	.19
Total commercial feed	4.79	--	4.79
Total all feed	13.34	7.82	21.16
Beg. ph.: wt., (lbs.)	412	529	412
Grade (%)	100 Gd	100 Gd	--
Price ($/cwt., mo.)	15.46, Dec.	14.86, May	--
Cost animal ($)	63.78	78.68	63.78
Cost animal, feed ($)	77.12	86.50	84.94
End. ph.: wt., (lbs.)	529	777	777
Grade (%)	100 Gd	100 Gd	--
Price ($/cwt., mo.)	14.86, May	13.75, Oct.	--
Value animal ($)	78.64	106.79	106.79
Gain (lbs.)	117	248	365
Feed cost/cwt. gain ($)	11.45	3.16	5.81
Value-cost animal ($)	14.86	28.11	43.01
Value-c-value comm. feed ($)	10.07	--	38.22
Value-c-g-value rough. ($)	1.52	20.29	21.85
No. years returns negative	14	3	7
" " " $ 0 - $10	12	9	2
" " " $10 - $20	4	7	7
" " " $20 - $50	1	9	9
" " " above $50	0	3	5
Returns/$ feed cost	1.11	3.59	2.03
Returns/$ total cost	.0197	.2346	.2571

Table 3. Feed fed, costs and returns for wintered and grazed steers, C, 30 head.

Phase and no. days	Winter (147)	Graze (151)	Total (298)
Daily Ration: (lbs.)			
Prairie hay	12.29	--	--
Milo	2.00	--	--
Soybean oil meal	1.00	--	--
Total Feed:			
Prairie hay (tons)	.81	--	.81
Milo (bu.)	5.25	--	5.25
Soybean oil meal (cwt.)	1.47	--	1.47
Value of Feed: ($)			
Prairie hay	8.08	--	8.08
Pasture	--	7.82	7.82
Total roughage	8.08	7.82	15.90
Milo	4.53	--	4.53
Total grain	4.53	--	4.53
Soybean oil meal	4.60	--	4.60
Salt and minerals	.12	--	.12
Total commercial feed	4.72	--	4.72
Total all feed	17.33	7.82	25.15
Beg. ph.: wt., (lbs.)	413	589	413
Grade (%)	100 Gd	100 Gd	--
Price ($/cwt., mo.)	15.48, Dec.	14.87, May	--
Cost animal ($)	64.00	87.51	64.00
Cost animal, feed ($)	81.33	95.33	89.15
End. ph.: wt., (lbs.)	589	806	806
Grade (%)	100 Gd	100 Gd	--
Price ($/cwt., mo.)	14.87, May	13.75, Oct.	--
Value animal ($)	87.51	110.87	110.87
Gain (lbs.)	176	217	393
Feed cost/cwt. gain ($)	9.88	3.59	6.40
Value-cost animal ($)	23.51	23.36	46.87
Value-c-value comm. feed ($)	18.79	--	42.15
Value-c-c-value grain ($)	14.26	--	37.62
Value-c-c-g-value rough. ($)	6.18	15.54	21.72
No. years returns negative	8	4	7
" " " $ 0 - $10	15	9	4
" " " $10 - $20	4	10	7
" " " $20 - $50	4	6	8
" " " above $50	0	2	5
Returns/$ feed cost	1.36	2.99	1.86
Returns/$ total cost	.0760	.0163	.2436

Table 4. Feed fed, costs and returns for wintered and grazed steers, D, 30 head.

Phase and no. days	Winter (147)	Graze (151)	Total (298)
Daily Ration: (lbs.)			
Prairie hay	10.98	--	--
Milo	4.00	--	--
Soybean oil meal	1.00	--	--
Total Feed:			
Prairie hay (tons)	.75	--	.75
Milo (bu.)	10.51	--	10.51
Soybean oil meal (cwt.)	1.47	--	1.47
Value of Feed: ($)			
Prairie hay	7.46	--	7.46
Pasture	--	7.82	7.82
Total roughage	7.46	7.82	15.28
Milo	9.06	--	9.06
Total grain	9.06	--	9.06
Soybean oil meal	4.60	--	4.60
Salt and minerals	.09	--	.09
Total commercial feed	4.69	--	4.69
Total all feed	21.21	7.82	29.03
Beg. ph.: wt., (lbs.)	414	633	414
Grade (%)	100 Gd	100 Gd	--
Price ($/cwt., mo.)	15.46, Dec.	14.87, May	--
Cost animal ($)	63.96	94.10	63.96
Cost animal, feed ($)	85.17	101.92	92.99
End. ph.: wt., (lbs.)	633	827	827
Grade (%)	100 Gd	100 Gd	--
Price ($/cwt., mo.)	14.87, May	13.75, Oct.	--
Value animal ($)	94.10	113.76	113.76
Gain (lbs.)	219	194	413
Feed cost/cwt. gain ($)	9.67	4.02	7.02
Value-cost animal ($)	30.14	19.66	49.80
Value-c-value comm. feed ($)	25.45	--	45.11
Value-c-c-value grain ($)	16.39	--	36.05
Value-c-c-g-value rough. ($)	8.93	11.84	20.77
No. years returns negative	8	7	7
" " " $ 0 - $10	9	10	4
" " " $10 - $20	10	8	8
" " " $20 - $50	4	4	7
" " " above $50	0	2	5
Returns/$ feed cost	1.42	2.51	1.72
Returns/$ total cost	.1048	.1162	.2234

Table 5. Feed fed, costs and returns for wintered and grazed steers, G, 49 head.

Phase and no. days	Winter (145)	Graze (132)	Total (277)
Daily Ration: (lbs.)			
Prairie hay	12.38	--	--
Soybean oil meal	1.00	--	--
Total Feed:			
Prairie hay (tons)	.90	--	.90
Soybean oil meal (cwt.)	1.45	--	1.45
Value of Feed: ($)			
Prairie hay	8.99	--	8.99
Pasture	--	7.82	7.82
Total roughage	8.99	7.82	16.81
Soybean oil meal	4.53	--	4.53
Salt and minerals	.12	--	.12
Total commercial feed	4.65	--	4.65
Total all feed	13.64	7.82	21.46
Beg. ph.: wt., (lbs.)	436	577	436
Grade (%)	20 Ch, 80 Gd	20 Ch, 80 Gd	--
Price ($/cwt., mo.)	15.46, Dec.	15.12, May	--
Cost animal ($)	67.35	87.28	67.35
Cost animal, feed ($)	80.99	95.10	88.81
End. ph.: wt., (lbs.)	577	782	782
Grade (%)	20 Ch, 80 Gd	20 Ch, 80 Gd	--
Price ($/cwt., mo.)	15.12, May	14.22, Sept.	--
Value animal ($)	87.28	111.13	111.13
Gain (lbs.)	141	205	346
Feed cost/cwt. gain ($)	9.64	3.78	6.20
Value-cost animal ($)	19.93	23.85	43.78
Value-c-value comm. feed ($)	15.28	--	39.13
Value-c-c-value grain ($)	--	--	--
Value-c-c-g-value rough. ($)	6.29	16.03	22.32
No. years returns negative	9	2	5
" " " $ 0 - $10	13	11	5
" " " $10 - $20	5	10	8
" " " $20 - $50	4	6	9
" " " above $50	0	2	4
Returns/$ feed cost	1.46	3.05	2.04
Returns/$ total cost	.0775	.1684	.2512

Table 6. Feed fed, costs and returns for wintered and full fed steers, E, 5 head.

Phase and no. days	Winter (140)	Full Feed (169)	Total (309)
Daily Ration: (lbs.) silage	22.57	--	--
Alfalfa hay	--	1.78	--
Prairie hay	--	3.26	--
Milo	4.00	15.74	--
Soybean oil meal	1.00	1.00	--
Total Feed: silage (tons)	1.58	--	1.58
Alfalfa hay (tons)	--	.15	.15
Prairie hay (tons)	--	.28	.28
Milo (bu.)	10.00	47.50	57.50
Soybean oil meal (cwt.)	1.40	1.69	3.09
Value of Feed: ($) silage	7.02	--	7.02
Alfalfa hay	--	2.21	2.21
Prairie hay	--	2.76	2.76
Total roughage	7.02	4.97	11.99
Milo	8.62	40.95	49.57
Total grain	8.62	40.95	49.57
Soybean oil meal	4.38	5.28	9.66
Salt and minerals	.28	--	.28
Total commercial feed	4.66	5.28	9.94
Total all feed	20.30	51.20	71.50
Beg. ph.: wt., (lbs.)	336	577	336
Grade (A)	50 Ch, 50 Gd	100 Ch	--
Price ($/cwt., mo.)	13.98, Nov.	13.89, Apr.	--
Cost animal ($)	46.96	80.17	46.96
Cost animal, feed ($)	67.26	131.37	118.46
End. ph.: wt., (lbs.)	577	919	919
Grade (A)	100 Ch	80 Ch, 20 Gd	--
Price ($/cwt., mo.)	13.89, Apr.	16.01, Sept.	--
Value animal ($)	80.17	147.14	147.14
Gain (lbs.)	241	342	583
Feed cost/cwt. gain ($)	8.42	14.97	12.26
Value-cost animal ($)	33.21	66.97	100.18
Value-c-value comm. feed ($)	28.55	61.69	90.24
Value-c-c-value grain ($)	19.93	20.74	40.67
Value-c-c-g-value rough. ($)	12.91	15.77	28.68
No. years returns negative	7	7	7
" " " $ 0 - $10	8	4	2
" " " $10 - $20	9	10	3
" " " $20 - $50	6	7	15
" " " above $50	1	3	4
Returns/$ feed cost	1.64	1.31	1.40
Returns/$ total cost	.1919	.1200	.2421

Table 7. Feed fed, costs and returns for wintered and full fed steers, J, 5 head.

Phase and no. days	Winter (132)	Full Feed (170)	Total (302)
Daily Ration: (lbs.) silage	28.37	--	--
Alfalfa hay	--	1.98	--
Prairie hay	--	6.44	--
Corn	--	11.60	--
Soybean oil meal	1.00	1.05	--
Total Feed: silage (tons)	1.87	--	1.87
Alfalfa hay (tons)	--	.17	.17
Prairie hay (tons)	--	.55	.55
Corn (bu.)	--	35.21	35.21
Soybean oil meal (cwt.)	1.32	1.78	3.10
Value of Feed: ($) silage	8.34	--	8.34
Alfalfa hay	--	2.48	2.48
Prairie hay	--	5.48	5.48
Total roughage	8.34	7.96	16.30
Corn	--	33.81	33.81
Total grain	--	33.81	33.81
Soybean oil meal	4.13	5.58	9.71
Salt and minerals	.06	.04	.10
Total commercial feeds	4.19	5.62	9.81
Total all feed	12.53	47.39	59.92
Beg. ph.: wt., (lbs.)	448	587	448
Grade (%)	100 Gd	100 Gd	--
Price ($/cwt., mo.)	15.46, Dec.	14.64, Apr.	--
Cost animal ($)	69.27	85.92	69.27
Cost animal, feed ($)	81.80	133.31	129.19
End. ph.: wt., (lbs.)	587	920	920
Grade (%)	100 Gd	40 Gd, 60 Com	--
Price ($/cwt., mo.)	14.64, Apr.	14.45, Nov.	--
Value animal ($)	85.92	132.94	132.94
Gain (lbs.)	139	333	472
Feed cost/cwt. gain ($)	9.01	14.23	12.69
Value-cost animal ($)	16.65	47.02	63.67
Value-c-value comm. feed ($)	12.46	41.40	53.86
Value-c-c-value grain ($)	--	7.59	20.05
Value-c-c-g-value rough. ($)	4.12	-0.37	3.75
No. years returns negative	12	16	13
" " " $ 0 - $10	12	8	7
" " " $10 - $20	5	2	5
" " " $20 - $30	2	5	5
" " " above $30	0	0	1
Returns/$ feed cost	1.33	.99	1.06
Returns/$ total cost	.0504	-.0028	.0290

Table 8. Feed fed, costs and returns for wintered and full fed steers, K, 20 head.

Phase and no. days	Winter (168)	Full Feed (121)	Total (289)
Daily Ration: (lbs.) silage	36.13	29.26	--
Ground alfalfa	--	3.00	--
Milo	1.75	12.36	--
Cottonseed meal	1.25	.75	--
Total Feed: silage (tons)	3.03	1.77	4.80
Ground alfalfa	--	.18	.18
Milo (bu.)	5.25	26.72	31.97
Cottonseed meal (cwt.)	2.10	.91	3.01
Value of Feed: ($) silage	13.51	7.88	21.39
Ground alfalfa	--	2.99	2.99
Total roughage	13.51	10.87	24.38
Milo	4.53	23.03	27.56
Total grain	4.53	23.03	27.56
Cottonseed meal	6.31	2.73	9.04
Salt and minerals	--	.03	.03
Total commercial feed	6.31	2.76	9.07
Total all feed	24.35	36.66	61.01
Beg. ph.: wt., (lbs.)	474	725	474
Grade (%)	50 Ch, 50 Gd	50 Ch, 50 Gd	--
Price ($/cwt., mo.)	15.58, Nov.	15.50, May	--
Cost animal ($)	73.86	112.42	73.86
Cost animal, feed ($)	98.21	149.08	134.87
End. ph.: wt., (lbs.)	725	981	981
Grade (%)	50 Ch, 50 Gd	40 Ch, 60 Gd	--
Price ($/cwt., mo.)	15.50, May	16.12, Sept.	--
Value animal ($)	112.42	158.17	158.16
Gain (lbs.)	251	256	507
Feed cost/cwt. gain ($)	9.68	14.35	12.03
Value-cost animal ($)	38.56	45.75	84.30
Value-c-value comm. feed ($)	32.25	42.99	75.23
Value-c-c-value grain ($)	27.72	19.96	47.67
Value-c-c-g-value rough. ($)	14.21	9.09	23.29
No. years returns negative	6	11	8
" " " $ 0 - $10	7	8	3
" " " $10 - $20	12	3	6
" " " $20 - $50	3	8	9
" " " above $50	3	1	5
Returns/$ feed cost	1.58	1.25	1.38
Returns/$ total cost	.1446	.0610	.1727

Table 9. Feed fed, costs and returns for deferred steers, E, 150 head.

Phase and no. days	Winter (137)	Graze (90)	Full Feed (102)	Total (329)
Daily Ration: (lbs.) silage	20.56	—	—	—
Alfalfa hay	1.55	—	4.36	—
Prairie hay	.16	—	1.16	—
Corn	4.06	—	12.84	—
Milo	.62	—	2.60	—
Cottonseed meal	.86	—	.93	—
Soybean oil meal	.13	—	.20	—
Total Feed: silage (tons)	1.41	—	—	1.41
Alfalfa hay (tons)	.11	—	.22	.33
Prairie hay (tons)	.01	—	.06	.07
Corn (bu.)	9.92	—	23.38	33.30
Milo (bu.)	1.52	—	4.74	6.26
Cottonseed meal (cwt.)	1.18	—	.95	2.13
Soybean oil meal (cwt.)	.18	—	.20	.38
Value of Feed: ($) silage	6.26	—	—	6.26
Alfalfa hay	1.56	—	3.27	4.83
Prairie hay	.11	—	.59	.70
Pasture	—	7.83	—	7.83
Total roughage	7.93	7.83	3.86	19.62
Corn	9.52	—	22.45	31.97
Milo	1.31	—	4.08	5.39
Total grain	10.83	—	26.53	37.36
Cottonseed meal	3.53	—	2.85	6.38
Soybean oil meal	.57	—	.62	1.19
Salt and minerals	.04	—	.02	.06
Total commercial feed	4.14	—	3.49	7.63
Total all feed	22.90	7.83	33.88	64.61
Beg. ph.: wt., (lbs.)	392.14	642.24	734.65	392.14
Grade (%)	50 Ch, 50 Gd	40 Ch, 60 Gd	40 Ch, 60 Gd	—
Price ($/cwt., mo.)	15.46, Dec.	15.37, May	14.56, Aug.	—
Cost animal ($)	60.63	98.74	107.00	60.63
Cost animal, feed ($)	83.53	106.57	140.88	125.24
End. ph.: wt., (lbs.)	642.24	734.65	1003.48	1003.48
Grade (%)	40 Ch, 60 Gd	40 Ch, 60 Gd	38 Ch, 62 Gd	—
Price ($/cwt., mo.)	15.37, May	14.56, Aug.	15.88, Nov.	—
Value animal ($)	98.74	107.00	159.40	159.40
Gain (lbs.)	250.10	92.41	268.83	611.34
Feed cost/cwt. gain ($)	9.16	8.46	12.60	10.57

Table 9. (conc'l.)

Phase and no. days	Winter (137)	Graze (90)	Full Feed (102)	Total (329)
Value-cost animal ($)	38.11	8.26	52.40	98.77
Value-c-value comm. feed ($)	33.97	--	48.91	91.14
Value-c-c-value grain ($)	23.14	--	22.38	53.78
Value-c-c-g-value rough. ($)	15.21	.43	18.52	34.16
No. years returns negative	4	17	2	1
" " " $ 0 - $10	8	10	8	3
" " " $10 - $20	10	2	10	9
" " " $20 - $50	7	2	9	10
" " " above $50	2	0	2	8
Returns/$ feed cost	1.66	1.06	1.55	1.53
Returns/$ total cost	.1821	.0041	.1315	.2728

Table 10. Feed fed, costs and returns for deferred steers, B, 50 head.

Phase and no. days	Winter (136)	Graze (89)	Full Feed (105)	Total (330)
Daily Ration: (lbs.) silage	19.16	--	--	--
Alfalfa hay	1.20	--	--	--
Prairie hay	3.96	--	--	--
Corn	3.86	--	11.95	--
Milo	1.06	--	3.87	--
Cottonseed meal	.79	--	.94	--
Soybean oil meal	.20	--	.29	--
Total Feed: silage (tons)	1.30	--	--	1.30
Alfalfa hay (tons)	.08	--	--	.08
Prairie hay (tons)	.27	--	--	.27
Corn (bu.)	9.38	--	22.46	31.84
Milo (bu.)	2.58	--	7.26	9.84
Cottonseed meal (cwt.)	1.08	--	.99	2.07
Soybean oil meal (cwt.)	.27	--	.30	.57
Value of Feed: ($) silage	5.80	--	--	5.80
Alfalfa hay	1.20	--	--	1.20
Prairie hay	2.70	--	--	2.70
Pasture	--	7.82	2.61	10.43
Total roughage	9.70	7.82	2.61	20.13
Corn	9.01	--	21.56	30.57
Milo	2.22	--	6.26	8.48
Total grain	11.23	--	27.82	39.05
Cottonseed meal	3.25	--	2.96	6.21
Soybean oil meal	.85	--	.95	1.80
Salt and minerals	.06	--	.02	.08
Total commercial feed	4.16	--	3.93	8.09
Total all feed	25.09	7.82	34.36	67.27
Beg. ph.: wt., (lbs.)	372	627	723	372
Grade (%)	50 Ch, 50 Gd	33 Ch, 67 Gd	33 Ch, 67 Gd	--
Price ($/cwt., mo.)	15.46, Dec.	15.37, May	14.56, Aug.	--
Cost animal ($)	57.55	96.42	105.33	57.55
Cost animal, feed ($)	82.64	104.24	139.69	124.82
End. ph.: wt., (lbs.)	627	723	1002	1002
Grade (%)	33 Ch, 67 Gd	33 Ch, 67 Gd	35 Ch, 65 Gd	--
Price ($/cwt., mo.)	15.37, May	14.56, Aug.	15.80, Nov.	--
Value animal ($)	96.42	105.33	158.24	158.24
Gain (lbs.)	255	96	279	630
Feed cost/cwt. gain ($)	9.84	8.15	12.34	10.69

Table 10. (conc'l.)

Phase and no. days	Winter (136)	Graze (89)	Full Feed (105)	Total (330)
Value-cost animal ($)	38.87	8.91	52.91	100.68
Value-c-value comm. feed ($)	34.71	---	48.98	92.59
Value-c-c-value grain ($)	23.48	---	21.16	53.54
Value-c-c-g-value rough. ($)	13.78	1.09	18.55	33.41
No. years returns negative	5	15	2	2
" " " $ 0 - $10	8	12	7	2
" " " $10 - $20	12	2	13	10
" " " $20 - $50	4	2	7	10
" " " above $50	2	0	2	7
Returns/$ feed cost	1.55	1.14	1.54	1.50
Returns/$ total cost	.1667	.0104	.1328	.2676

Table 11. Feed fed, costs and returns for deferred heifers, A, 19 head.

Phase and no. days	Winter (139)	Full Feed (104)	Total (243)
Daily Ration: (lbs.) silage	19.56	2.29	--
Alfalfa hay	--	3.97	--
Prairie hay	2.63	4.78	--
Corn	1.00	4.93	--
Milo	.95	7.38	--
Alfalfa pellets	.92	1.38	--
Cottonseed meal	.47	--	--
Soybean oil meal	--	1.10	--
Total Feed: silage (tons)	1.36	.12	1.48
Alfalfa hay (tons)	--	.21	.21
Prairie hay (tons)	.18	.25	.43
Corn (bu.)	2.47	9.12	11.59
Milo (bu.)	2.34	13.65	15.99
Alfalfa pellets (cwt.)	1.28	1.44	2.72
Cottonseed meal (cwt.)	.66	--	.66
Soybean oil meal (cwt.)	--	1.14	1.14
Value of Feed: ($) silage	6.04	.53	6.57
Alfalfa hay	--	3.02	3.02
Prairie hay	1.82	2.48	4.30
Total roughage	7.86	6.03	13.89
Corn	2.38	8.76	11.14
Milo	2.02	11.77	13.79
Total grain	4.40	20.53	24.93
Alfalfa pellets	2.67	3.01	5.68
Cottonseed meal	1.97	--	1.97
Soybean oil meal	--	3.57	3.57
Salt and minerals	.09	.01	.10
Total commercial feed	4.73	6.59	11.32
Total all feed	16.99	33.15	50.14
Beg. ph.: wt., (lbs.)	440	580	440
Grade (%)	100 Gd	100 Gd	--
Price ($/cwt., mo.)	13.98, Nov.	12.67, Apr.	--
Cost animal ($)	61.54	73.53	61.54
Cost animal, feed ($)	78.53	106.68	111.68
End. ph.: wt., (lbs.)	580	805	805
Grade (%)	100 Gd	42 Ch, 31 Gd, 27 Cm	--
Price ($/cwt., mo.)	12.67, Apr.	15.10, Jul.	--
Value animal ($)	73.53	121.56	121.56
Gain (lbs.)	140	225	365
Feed cost/cwt. gain ($)	12.13	14.75	13.74
Value-cost animal ($)	11.99	48.03	60.02
Value-c-value comm. feed ($)	7.26	41.44	48.70
Value-c-c-value grain ($)	2.86	20.91	23.77
Value-c-c-g-value rough. ($)	-5.00	14.88	9.88

Table 11. (conc'l)

Phase and no. days	Winter (139)	Full Feed (104)	Total (243)
No. years returns negative	26	5	10
" " " $ 0 - $10	2	9	9
" " " $10 - $20	2	10	6
" " " $20 - $50	1	6	4
" " " above $50	0	1	2
Returns/$ feed cost	.71	1.45	1.20
Returns/$ total cost	-.0637	.1395	.0885

Table 12. Feed fed, costs and returns for deferred heifers, B, 59 head.

Phase and no. days	Winter (155)	Graze (71)	Full Feed (106)	Total (332)
Daily Ration: (lbs.) silage	20.66	--	--	--
Alfalfa hay	--	--	.94	--
Prairie hay	2.71	--	5.69	--
Corn	1.00	--	11.52	--
Milo	.98	--	2.70	--
Cottonseed meal	.68	--	.60	--
Soybean oil meal	.32	--	1.02	--
Total Feed: silage (tons)	1.60	--	--	1.60
Alfalfa hay (tons)	--	--	.05	.05
Prairie hay (tons)	.21	--	.30	.51
Corn (bu.)	2.75	--	21.76	24.51
Milo (bu.)	2.72	--	5.09	7.81
Cottonseed meal (cwt.)	1.06	--	.63	1.69
Soybean oil meal (cwt.)	.50	--	1.08	1.58
Value of Feed: ($) silage	7.13	--	--	7.13
Alfalfa hay	--	--	.73	.73
Prairie hay	2.11	--	3.01	5.12
Pasture	--	7.82	--	7.82
Total roughage	9.24	7.82	3.74	20.80
Corn	2.64	--	20.89	23.53
Milo	2.35	--	4.39	6.74
Total grain	4.99	--	25.28	30.27
Cottonseed meal	3.19	--	1.91	5.10
Soybean oil meal	1.56	--	3.37	4.93
Salt and minerals	.12	--	.05	.17
Total commercial feeds	4.87	--	5.33	10.20
Total all feed	19.10	7.82	34.35	61.27
Beg. ph.: wt., (lbs.)	435	627	703	435
Grade (%)	50 Ch, 50 Gd	41 Ch, 59 Gd	41 Ch, 59 Gd	--
Price ($/cwt., mo.)	13.98, Nov.	13.44, May	12.80, Jul.	--
Cost animal ($)	60.86	84.25	89.95	60.86
Cost animal, feed ($)	79.96	92.07	124.30	122.13
End. ph.: wt., (lbs.)	627	703	929	929
Grade (%)	41 Ch, 59 Gd	41 Ch, 59 Gd	56 Ch, 36 Gd 8 Pr	--
Price ($/cwt., mo.)	13.44, May	12.80, Jul.	15.57, Oct.	--
Value animal ($)	84.25	89.95	144.65	144.65
Gain (lbs.)	192	76	226	494
Feed cost/cwt. gain ($)	9.97	10.29	15.19	12.41

Table 12. (conc'l.)

Phase and no. days	Winter (155)	Graze (71)	Full Feed (106)	Total (332)
Value-cost animal ($)	23.39	5.70	54.70	83.79
Value-c-value comm. feed ($)	18.52	—	49.37	73.59
Value-c-c-value grain ($)	13.53	—	24.09	43.32
Value-c-c-g-value rough. ($)	4.29	-2.12	20.35	22.52
No. years returns negative	11	19	1	6
" " " $ 0 - $10	14	8	6	5
" " " $10 - $20	3	4	11	6
" " " $20 - $50	3	0	11	10
" " " above $50	0	0	2	4
Returns/$ feed cost	1.22	.73	1.59	1.38
Returns/$ total cost	.0537	-.0023	.1636	.1844

Table 13. Feed fed, costs and returns for deferred heifers, C, 30 head.

Phase and no. days	Winter (158)	Graze (102)	Full Feed (75)	Total (335)
Daily Ration: (lbs.) silage	19.81	—	—	—
Alfalfa hay	—	—	1.94	—
Prairie hay	3.93	—	6.15	—
Corn	—	—	7.91	—
Milo	—	—	5.23	—
Cottonseed meal	.34	—	—	—
Soybean oil meal	.67	.41	1.58	—
Total Feed: silage (tons)	1.56	—	—	1.56
Alfalfa hay (tons)	—	—	.07	.07
Prairie hay (tons)	.31	—	.23	.54
Corn (bu.)	—	—	10.54	10.54
Milo (bu.)	—	—	6.97	6.97
Cottonseed meal (cwt.)	.53	—	—	.53
Soybean oil meal (cwt.)	1.05	.42	1.18	2.65
Value of Feed: ($) silage	6.97	—	—	6.97
Alfalfa hay	—	—	1.06	1.06
Prairie hay	3.11	—	2.30	5.41
Pasture	—	7.82	—	7.82
Total roughage	10.08	7.82	3.36	21.26
Corn	—	—	10.12	10.12
Milo	—	—	6.01	6.01
Total grain	—	—	16.13	16.13
Cottonseed meal	1.60	—	—	1.60
Soybean oil meal	3.29	1.30	3.70	8.29
Salt and minerals	.08	—	.02	.10
Total commercial feeds	4.97	1.30	3.72	9.99
Total all feed	15.05	9.12	23.21	47.38
Beg. ph.: wt., (lbs.)	431	570	709	431
Grade (%)	100 Gd	40 Ch, 60 Gd	40 Ch, 60 Gd	—
Price ($/cwt., mo.)	13.98, Nov.	13.43, May	12.74, Aug.	—
Cost animal ($)	60.15	76.52	90.39	60.15
Cost animal, feed ($)	75.20	85.64	113.60	107.53
End. ph.: wt., (lbs.)	570	709	855	855
Grade (%)	40 Ch, 60 Gd	40 Ch, 60 Gd	40 Ch, 57 Gd 3 Pr	—
Price ($/cwt., mo.)	13.43, May	12.74, Aug.	14.93, Oct.	—
Value animal ($)	76.52	90.39	127.73	127.73

Table 13. (conc'l.)

Phase and no. days	Winter (158)	Graze (102)	Full Feed (75)	Total (335)
Gain (lbs.)	139	139	146	424
Feed cost/cwt. gain ($)	10.80	6.53	15.90	11.15
Value-cost animal ($)	16.37	13.87	37.34	67.58
Value-c-value comm. feed ($)	11.40	12.57	33.62	57.59
Value-c-c-value grain ($)	--	--	17.49	41.46
Value-c-c-g-value rough. ($)	1.32	4.75	14.13	20.20
No. years returns negative	14	10	2	8
" " " $ 0 - $10	12	14	7	3
" " " $10 - $20	3	3	16	8
" " " $20 - $50	2	4	6	7
" " " above $50	0	0	0	5
Returns/$ feed cost	1.09	1.52	1.61	1.43
Returns/$ total cost	.0176	.0555	.1244	.1882

Table 14. Feed fed, costs and returns for deferred heifers, D, 30 head.

Phase and no. days	Winter (158)	Graze (74)	Full Feed (102)	Total (334)
Daily Ration: (lbs.) silage	19.67	—	—	—
Alfalfa hay	—	—	1.85	—
Prairie hay	4.03	—	5.83	—
Corn	—	—	8.64	—
Milo	—	—	5.08	—
Cottonseed meal	.34	—	—	—
Soybean oil meal	.67	—	1.56	—
Total Feed: silage (tons)	1.56	—	—	1.56
Alfalfa hay (tons)	—	—	.09	.09
Prairie hay (tons)	.32	—	.30	.62
Corn (bu.)	—	—	15.70	15.70
Milo (bu.)	—	—	9.24	9.24
Cottonseed meal (cwt.)	.53	—	—	.53
Soybean oil meal (cwt.)	1.06	—	1.59	2.65
Value of Feed: ($) silage	6.95	—	—	6.95
Alfalfa hay	—	—	1.39	1.39
Prairie hay	3.19	—	2.97	6.16
Pasture	—	7.82	—	7.82
Total roughage	10.14	7.82	4.36	22.32
Corn	—	—	15.08	15.08
Milo	—	—	7.96	7.96
Total grain	—	—	23.04	23.04
Cottonseed meal	1.60	—	—	1.60
Soybean oil meal	3.31	—	4.97	8.28
Salt and minerals	.07	—	.03	.10
Total commercial feeds	4.98	—	5.00	9.98
Total all feed	15.12	7.82	32.40	55.34
Beg. ph.: wt., (lbs.)	432	586	680	432
Grade (%)	50 Ch, 50 Gd	40 Ch, 60 Gd	40 Ch, 60 Gd	—
Price ($/cwt., mo.)	13.98, Nov.	13.43, May	12.79, Jul.	—
Cost animal ($)	60.33	78.68	86.92	60.33
Cost animal, feed ($)	75.45	86.50	119.32	115.67
End. ph.: wt., (lbs.)	586	680	889	889
Grade (%)	40 Ch, 60 Gd	40 Ch, 60 Gd	57 Gd, 10 Ch 3 Pr	—
Price ($/cwt., mo.)	13.43, May	12.79, Jul.	14.95, Oct.	—
Value animal ($)	78.68	86.92	132.82	132.82

Table 14. (conc'l.)

Phase and no. days	Winter (158)	Graze (74)	Full Feed (102)	Total (334)
Gain (lbs.)	154	94	209	457
Feed cost/cwt. gain ($)	9.80	8.34	15.50	12.11
Value-cost animal ($)	18.35	8.24	45.90	72.49
Value-c-value comm. feed ($)	13.37	--	40.90	62.51
Value-c-c-value grain ($)	--	--	17.86	39.47
Value-c-c-g-value rough. ($)	3.23	0.42	13.50	17.15
No. years returns negative	12	16	3	10
" " " $ 0 - $10	13	11	9	1
" " " $10 - $20	3	4	12	10
" " " $20 - $50	3	0	7	6
" " " above $50	0	0	0	4
Returns/$ feed cost	1.21	1.05	1.42	1.31
Returns/$ total cost	.0428	.0049	.1131	.1482

Table 15. Feed fed, costs and returns for full fed steers, A, C and D.

Program and no. days	A (215)	C (137)	D (203)
Number head	30	27	10
Daily Ration: (lbs.) silage	7.22	--	--
Alfalfa hay	2.44	--	6.66
Prairie hay	.48	5.08	--
Milo	11.49	16.19	14.17
Cottonseed meal	--	2.00	--
Soybean oil meal	1.37	--	--
Total Feed: silage (tons)	.78	--	--
Alfalfa hay (tons)	.26	--	.68
Prairie hay (tons)	.05	.35	--
Milo (bu.)	44.33	39.60	51.37
Cottonseed meal (cwt.)	--	2.74	--
Soybean oil meal (cwt.)	2.96	--	--
Value of Feed: ($) silage	3.47	--	--
Alfalfa hay	3.87	--	9.94
Prairie hay	.52	3.49	--
Total roughage	7.86	3.49	9.94
Milo	38.22	34.14	44.28
Total grain	38.22	34.14	44.28
Cottonseed meal	--	8.23	--
Soybean oil meal	8.89	--	--
Salt and minerals	.08	.10	.04
Total commercial feed	8.97	8.33	.04
Total all feed	55.05	45.96	54.26
Beg. ph.: wt., (lbs.)	418	613	503
Grade (%)	50 Ch, 50 Gd	50 Ch, 50 Gd	100 Gd
Price ($/cwt., mo.)	15.46, Dec.	14.82, Jul.	13.40, Dec.
Cost animal ($)	64.68	90.80	67.38
Cost animal, feed ($)	119.73	136.76	121.64
End. ph.: wt., (lbs.)	899	928	949
Grade (%)	40 Pr, 60 Ch	7 Pr, 93 Ch	10 Pr, 70 Ch, 20 Gd
Price ($/cwt., mo.)	17.38, Jul.	17.69, Dec.	16.77, Jul.
Value animal ($)	156.38	164.12	159.12
Gain (lbs.)	481	315	446
Feed cost/cwt. gain ($)	11.44	14.59	12.17
Value-cost animal ($)	91.70	73.32	91.74
Value-c-value comm. feed ($)	82.73	64.99	91.70
Value-c-c-value grain ($)	44.51	30.85	47.42
Value-c-c-g-value rough. ($)	36.65	27.36	37.48
No. years returns negative	2	2	3
" " " $ 0 - $10	5	6	5
" " " $10 - $20	2	7	1
" " " $20 - $50	14	10	14
" " " above $50	8	6	8
Returns/$ feed cost	1.67	1.60	1.69
Returns/$ total cost	.3061	.2001	.3081

Table 16. Feed fed, costs and returns for full fed steers, 19 and 21.

Program and no. days	19 (203)	21 (203)
Number head	10	9
Daily Ration: (lbs.)		
Alfalfa hay	12.22	5.08
Milo	11.03	14.29
Total Feed:		
Alfalfa hay (tons)	1.24	.52
Milo (bu.)	39.99	51.81
Value of Feed: ($)		
Alfalfa hay	18.23	7.58
Total roughage	18.23	7.58
Milo	34.48	44.67
Total grain	34.48	44.67
Salt and minerals	.05	.06
Total commercial feeds	.05	.06
Total all feed	52.76	52.31
Beg. ph.: wt., (lbs.)	502	505
Grade (%)	20 Ch, 80 Gd	22 Ch, 78 Gd
Price ($/cwt., mo.)	13.65, Dec.	13.68, Dec.
Cost animal ($)	68.52	69.07
Cost animal, feed ($)	121.28	121.38
End. ph.: wt., (lbs.)	934	933
Grade (%)	80 Ch, 20 Gd	100 Ch
Price ($/cwt., mo.)	16.60, Jul.	16.95, Jul.
Value animal ($)	155.09	158.19
Gain (lbs.)	432	428
Feed cost/cwt. gain ($)	12.21	12.22
Value-cost animal ($)	86.57	89.12
Value-c-value comm. feed ($)	86.52	89.06
Value-c-c-value grain ($)	52.04	44.39
Value-c-c-g-value roughage ($)	33.81	36.81
No. years returns negative	4	3
" " " $ 0 - $10	4	5
" " " $10 - $20	0	1
" " " $20 - $50	17	14
" " " above $50	6	8
Returns/$ feed cost	1.64	1.70
Returns/$ total cost	.2788	.3033

Table 17. Feed fed, costs and returns for full fed steers, 15, 16, 17 and 18.

Program and no. days	15 (180)	16 (180)	17 (180)	18 (180)
Number head	10	10	10	10
Daily Ration: (lbs.) silage	17.81	33.55	41.76	45.07
Barley	14.04	9.36	4.68	--
Cottonseed meal	1.11	1.11	1.11	1.11
Total Feed: silage (tons)	1.60	3.02	3.76	4.06
Barley (bu.)	52.65	35.10	17.55	--
Cottonseed meal (cwt.)	2.00	2.00	2.00	2.00
Value of Feed: ($) silage	7.14	13.45	16.74	18.06
Total roughage	7.14	13.45	16.74	18.06
Barley	40.90	27.27	13.64	--
Total grain	40.90	27.27	13.64	--
Cottonseed meal	6.01	6.01	6.01	6.01
Salt and minerals	.08	.08	.08	.08
Total commercial feeds	6.09	6.09	6.09	6.09
Total all feed	54.13	46.81	36.47	24.15
Beg. ph.: wt., (lbs.)	751	754	760	752
Grade (%)	100 Ch	100 Ch	100 Ch	100 Ch
Price ($/cwt., mo.)	14.77, Oct.	14.77, Oct.	14.77, Oct.	14.77, Oct.
Cost animal ($)	110.92	111.36	112.24	111.06
Cost animal, feed ($)	165.05	158.17	148.71	135.21
End. ph.: wt., (lbs.)	1120	1077	1057	930
Grade (%)	80 Ch, 20 Gd	80 Ch, 20 Gd	100 Gd	10 Gd, 90 Com
Price ($/cwt., mo.)	17.61, Apr.	17.61, Apr.	16.37, Apr.	14.88, Apr.
Value animal ($)	197.21	189.64	172.99	138.40
Gain (lbs.)	369	323	297	178
Feed cost/cwt. gain ($)	14.67	14.49	12.28	13.57
Value-cost animal ($)	86.29	78.28	60.75	27.34
Value-c-value comm. feed ($)	80.20	72.19	54.66	21.25
Value-c-c-value grain ($)	39.30	44.92	41.02	--
Value-c-c-g-value rough. ($)	32.16	31.47	24.28	3.19
No. years returns negative	4	3	5	15
" " " $ 0 - $10	3	4	5	2
" " " $10 - $20	6	6	6	8
" " " $20 - $50	9	9	8	6
" " " above $50	9	9	7	0
Returns/$ feed cost	1.59	1.67	1.67	1.13
Returns/$ total cost	.1949	.1990	.1633	.0236

Table 18. Feed fed, costs and returns for full fed steers, 22, 23, 24 and 25.

Program and no. days	22 (150)	23 (150)	24 (150)	25 (150)
Number head	10	10	10	19
Daily Ration: (lbs.) silage	41.39	33.82	24.82	31.50
Alfalfa hay	2.74	2.74	2.74	3.00
Milo	12.76	14.50	17.82	17.81
Cottonseed meal	1.50	1.50	1.50	1.50
Total Feed: silage (tons)	3.10	2.54	1.86	2.36
Alfalfa hay (tons)	.21	.21	.21	.23
Milo (bu.)	34.18	38.84	47.73	47.70
Cottonseed meal (cwt.)	2.25	2.25	2.25	2.25
Value of Feed: ($) silage	13.83	11.30	8.29	10.51
Alfalfa hay	3.02	3.02	3.02	3.30
Total roughage	16.85	14.32	11.31	13.81
Milo	29.46	33.48	41.15	41.13
Total grain	29.46	33.48	41.15	41.13
Cottonseed meal	6.76	6.76	6.76	6.76
Salt and minerals	.03	.03	.03	—
Total commercial feeds	6.79	6.79	6.79	6.76
Total all feed	53.10	54.59	59.25	61.70
Beg. ph.: wt., (lbs.)	796	797	796	827
Grade (%)	100 Gd	100 Gd	100 Gd	26 Ch, 74 Gd
Price ($/cwt., mo.)	13.69, Aug.	13.69, Aug.	13.69, Aug.	13.88, Sept.
Cost animal ($)	109.00	109.14	109.00	114.84
Cost animal, feed ($)	162.10	163.73	168.25	176.54
End. ph.: wt., (lbs.)	1186	1202	1239	1219
Grade (%)	20 Ch, 80 Gd	30 Ch, 70 Gd	70 Ch, 30 Gd	47 Ch, 47 Gd 6 Pr
Price ($/cwt., mo.)	15.01, Jan.	15.28, Jan.	16.35, Jan.	15.53, Feb.
Value animal ($)	178.00	183.65	202.52	189.42
Gain (lbs.)	390	405	443	392
Feed cost/cwt. gain ($)	13.62	13.48	13.37	15.74
Value-cost animal ($)	69.00	74.51	93.52	74.58
Value-c-value comm. feed ($)	62.21	67.72	86.73	67.82
Value-c-c-value grain ($)	32.75	34.24	45.58	26.69
Value-c-c-g-value rough. ($)	15.90	19.92	34.27	12.88
No. years returns negative	11	9	3	11
" " " $ 0 - $10	5	6	4	5
" " " $10 - $20	7	5	7	7
" " " $20 - $50	3	6	10	3
" " " above $50	5	5	7	5
Returns/$ feed cost	1.30	1.37	1.58	1.21
Returns/$ total cost	.0981	.1217	.2037	.0730

Table 19. Feed fed, costs and returns for full fed steers, I, II, III, and IV.

Program and no. days	I (110)	II (150)	III (150)	IV (140)
Number head	30	30	130	20
Daily Ration: (lbs.) silage	--	39.86	41.55	27.28
Alfalfa hay	--	--	--	2.79
Prairie hay	5.80	--	--	--
Corn	4.70	13.27	--	--
Milo	13.02	--	13.69	16.70
Cottonseed meal	.67	1.50	1.50	1.50
Soybean oil meal	.97	--	--	--
Total Feed: silage (tons)	--	2.99	3.12	1.91
Alfalfa hay (tons)	--	--	--	.20
Prairie hay (tons)	.32	--	--	--
Corn (bu.)	9.23	35.54	--	--
Milo (bu.)	25.56	--	36.68	41.75
Cottonseed meal (cwt.)	.74	2.25	2.25	2.10
Soybean oil meal (cwt.)	1.06	--	--	--
Value of Feed: ($) silage	--	13.31	13.88	8.50
Alfalfa hay	--	--	--	2.87
Prairie hay	3.19	--	--	--
Total roughage	3.19	13.31	13.88	11.37
Corn	8.86	34.13	--	--
Milo	22.02	--	31.62	35.99
Total grain	30.88	34.13	31.62	35.99
Cottonseed meal	2.22	6.76	6.76	6.32
Soybean oil meal	3.32	--	--	--
Salt and minerals	.10	.07	.07	.02
Total commercial feed	5.64	6.83	6.83	6.34
Total all feed	39.71	54.27	52.33	53.70
Beg. ph.: wt., (lbs.)	762	825	843	826
Grade (%)	50 Ch, 50 Gd	100 Ch	85 Ch, 15 Gd	100 Gd
Price ($/cwt., mo.)	14.69, Aug.	14.74, Nov.	14.53, Nov.	13.56, Sept.
Cost animal ($)	111.86	121.60	122.57	111.98
Cost animal, feed ($)	151.57	175.87	174.90	165.68
End. ph.: wt., (lbs.)	1041	1190	1215	1198
Grade (%)	30 Ch, 70 Gd	100 Ch	72 Ch, 28 Gd	60 Gd, 40 Gd
Price ($/cwt., mo.)	15.65, Nov.	17.92, Apr.	17.50, Apr.	16.06, Jan.
Value animal ($)	162.90	213.28	212.65	192.37
Gain (lbs.)	279	365	372	372
Feed cost/cwt. gain ($)	14.23	14.86	14.08	14.44
Value-cost animal ($)	51.04	91.68	90.08	80.39
Value-c-value comm. feed ($)	45.40	84.85	83.25	74.05
Value-c-c-value grain ($)	14.52	50.72	51.63	38.06
Value-c-c-g-value rough. ($)	11.33	37.41	37.75	26.69

Table 19. (conc'l.)

Program and no. days	I (110)	II (150)	III (150)	IV (140)
No. years returns negative	8	3	2	4
" " " $ 0 - $10	8	1	3	8
" " " $10 - $20	9	5	5	4
" " " $20 - $50	4	13	12	9
" " " above $50	2	9	9	6
Returns/$ feed cost	1.29	1.69	1.72	1.50
Returns/$ total cost	.0748	.2127	.2159	.1610

Table 20. Feed fed, costs and returns for full fed heifers, E, F, G and H.

Program and no. days	E (142)	F (208)	G (208)	H (104)
Number head	35	30	30	10
Daily Ration: (lbs.) silage	--	7.68	10.98	1.78
Alfalfa hay	--	1.07	1.21	1.67
Prairie hay	5.44	.95	1.08	3.29
Corn	3.15	9.06	9.59	12.06
Barley	8.70	--	--	--
Cottonseed meal	--	.85	.85	--
Soybean oil meal	1.90	.61	.60	1.39
Total Feed: silage (tons)	--	.80	1.14	.09
Alfalfa hay (tons)	--	.11	.13	.09
Prairie hay (tons)	.39	.10	.11	.17
Corn (bu.)	7.99	33.61	35.58	22.40
Barley (bu.)	25.75	--	--	--
Cottonseed meal (cwt.)	--	1.76	1.76	--
Soybean oil meal (cwt.)	2.70	1.27	1.26	1.45
Value of Feed: ($) silage	--	3.55	5.08	.41
Alfalfa hay	--	1.63	1.85	1.28
Prairie hay	3.87	.99	1.11	1.71
Total roughage	3.87	6.17	8.04	3.40
Corn	7.67	32.27	34.16	21.51
Barley	20.00	--	--	--
Total grain	--	32.27	34.16	21.51
Cottonseed meal	--	5.28	5.28	--
Soybean oil meal	8.43	3.96	3.94	4.51
Salt and minerals	.11	.08	.08	.09
Total commercial feed	8.54	9.32	9.30	4.60
Total all feed	40.08	47.76	51.50	29.51
Beg. ph.: wt., (lbs.)	543	386	467	583
Grade (%)	100 Gd	50 Ch, 50 Gd	50 Ch, 50 Gd	100 Gd
Price ($/cwt., mo.)	12.31, Jul.	13.98, Nov.	13.98, Nov.	12.67, Apr.
Cost animal ($)	66.90	53.99	65.22	73.85
Cost animal, feed ($)	106.98	101.75	116.72	103.36
End. ph.: wt., (lbs.)	834	750	862	785
Grade (%)	57 Ch, 43 Gd	7 Pr, 86 Ch, 7 Com	100 Ch	20 Ch, 80 Gd
Price ($/cwt., mo.)	14.91, Dec.	15.56, Jun.	15.66, Jun.	14.68, Jul.
Value animal ($)	124.38	116.68	134.99	115.20
Gain (lbs.)	291	364	395	202
Feed cost/cwt. gain ($)	13.79	13.13	13.03	14.61
Value-cost animal ($)	57.48	62.69	69.77	41.35
Value-c-value comm. feed ($)	48.94	53.37	60.47	36.75
Value-c-c-value grain ($)	21.27	21.10	26.31	15.24
Value-c-c-g-value rough. ($)	17.40	14.93	18.27	11.84

Table 20. (conc'l.)

Program and no. days	E (142)	F (208)	G (208)	H (104)
No. Years returns negative	4	5	5	6
" " " $ 0 - $10	8	11	7	12
" " " $10 - $20	11	7	8	8
" " " $20 - $50	6	6	9	4
" " " above $50	2	2	2	1
Returns/$ feed cost	1.43	1.31	1.35	1.40
Returns/$ total cost	.1626	.1467	.1565	.1146

Table 21. Feed fed, costs and returns for full fed heifers, 7, 8, 9 and 10.

Program and no. days	7 (154)	8 (154)	9 (154)	10 (154)
Number head	10	10	10	10
Daily Ration: (lbs.)				
Alfalfa hay	10.70	6.20	5.00	7.50
Milo	10.30	14.20	15.20	13.00
Total Feed:				
Alfalfa hay (tons)	.83	.48	.39	.58
Milo (bu.)	28.36	38.98	41.93	35.75
Value of Feed: ($)				
Alfalfa hay	12.18	6.98	5.67	8.51
Total roughage	12.18	6.98	5.67	8.51
Milo	24.45	33.71	36.15	30.82
Total grain	24.45	33.71	36.15	30.82
Total all feed	36.63	40.69	41.82	39.33
Beg. ph.: wt., (lbs.)	518	510	515	518
Grade (%)	25 Ch, 75 Gd	25 Ch, 75 Gd	25 Ch, 75 Gd	25 Ch, 75 Gd
Price ($/cwt., mo.)	13.25, May	13.25, May	13.25, May	13.25, May
Cost animal ($)	68.65	67.58	68.24	68.64
Cost animal, feed ($)	105.28	108.27	110.06	107.97
End. ph.: wt., (lbs.)	807	815	845	833
Grade (%)	30 Ch, 70 Gd	60 Ch, 40 Gd	90 Ch, 10 Gd	70 Ch, 30 Gd
Price ($/cwt., mo.)	14.54, Oct.	15.30 Oct.	16.09, Oct.	15.57, Oct.
Value animal ($)	117.33	124.70	135.92	129.70
Gain (lbs.)	289	305	330	315
Feed cost/cwt. gain ($)	12.67	13.34	12.67	12.49
Value-cost animal ($)	48.68	57.12	67.68	61.06
Value-c-value grain ($)	24.23	23.41	31.53	30.24
Value-c-g-value rough. ($)	12.05	16.43	25.86	21.73
No. years returns negative	6	5	5	5
" " " $ 0 - $10	8	4	3	3
" " " $10 - $20	10	11	4	9
" " " $20 - $50	6	9	15	11
" " " above $50	1	2	4	3
Returns/$ feed cost	1.33	1.40	1.62	1.55
Returns/$ total cost	.1145	.1517	.2350	.2012

Table 22. Feed fed, costs and returns for full fed heifers, 3, 4, 5, and 6.

Program and no. days	3 (91)	4 (91)	5 (91)	6 (91)
Number head	10	10	10	10
Daily Ration: (lbs.)				
Alfalfa hay	11.50	6.20	5.60	7.70
Corn	11.40	13.90	15.80	12.20
Total Feed:				
Alfalfa hay (tons)	.52	.33	.25	.35
Corn (bu.)	18.48	22.55	26.29	19.80
Value of Feed: ($)				
Alfalfa hay	7.69	4.87	3.73	5.13
Total roughage	7.69	4.87	3.73	5.13
Corn	17.75	21.66	25.24	19.02
Total grain	17.75	21.66	25.24	19.02
Total all feed	25.44	26.53	28.97	24.15
Beg. ph.: wt., (lbs.)	639	639	637	638
Grade (%)	25 Ch, 75 Gd	25 Ch, 75 Gd	25 Ch, 75 Gd	25 Ch, 75 Gd
Price ($/cwt., mo.)	13.25, May	13.25, May	13.25, May	13.25, May
Cost animal ($)	84.67	84.67	84.41	84.54
Cost animal, feed ($)	110.11	111.20	113.38	108.69
End. ph.: wt., (lbs.)	806	818	850	800
Grade (%)	10 Pr, 80 Gd 10 Cm	50 Ch, 50 Gd	60 Ch, 40 Gd	30 Ch, 70 Gd
Price ($/cwt., mo.)	14.52, Aug.	15.30, Aug.	15.53, Aug.	14.85, Aug.
Value animal ($)	117.01	125.16	131.99	118.79
Gain (lbs.)	167	179	213	162
Feed cost/cwt. gain ($)	15.23	14.82	13.60	14.91
Value-cost animal ($)	32.34	40.49	47.58	34.25
Value-c-value grain ($)	14.59	18.83	22.34	15.23
Value-c-g-value rough. ($)	6.90	13.96	18.61	10.10
No. years returns negative	10	4	3	6
" " " $ 0 - $10	10	10	6	10
" " " $10 - $20	9	7	11	9
" " " $20 - $50	1	9	10	5
" " " above $50	1	1	1	1
Returns/$ feed cost	1.27	1.53	1.64	1.42
Returns/$ total cost	.0627	.1255	.1642	.0929

Table 23. Feed fed, costs and returns for full fed heifers, 11, 12, 13 and 14.

Program and no. days	11 (125)	12 (125)	13 (125)	14 (125)
Number head	9	10	10	10
Daily Ration: (lbs.)				
Alfalfa hay	13.30	5.90	4.20	8.20
Milo	13.30	16.80	18.30	17.30
Total Feed:				
Alfalfa hay (tons)	.83	.37	.26	.51
Milo (bu.)	29.75	37.46	40.88	38.55
Value of Feed: ($)				
Alfalfa hay	12.25	5.40	3.84	7.49
Total roughage	12.25	5.40	3.84	7.49
Milo	25.65	32.30	35.24	33.24
Total grain	25.65	32.30	35.24	33.24
Total all feed	37.90	37.70	39.08	40.73
Beg. ph.: wt., (lbs.)	711	712	703	705
Grade (%)	25 Ch, 75 Gd	25 Ch, 75 Gd	25 Ch, 75 Gd	25 Ch, 75 Gd
Price ($/cwt., mo.)	13.25, May	13.25, May	13.25, May	13.25, May
Cost animal, ($)	94.21	94.34	93.16	93.42
Cost animal, feed ($)	132.11	132.04	132.24	134.15
End. ph.: wt., (lbs.)	987	987	993	995
Grade (%)	67 Ch, 33 Gd	80 Ch, 20 Gd	40 Ch, 60 Gd	40 Ch, 60 Gd
Price ($/cwt., mo.)	15.71, Sept.	16.01, Sept.	15.07, Sept.	15.07, Sept.
Value animal ($)	155.03	158.02	149.60	150.22
Gain (lbs.)	276	275	290	290
Feed cost/cwt. gain ($)	13.73	13.71	13.48	14.04
Value-cost animal ($)	60.82	63.68	56.44	56.80
Value-c-value grain ($)	35.17	31.38	21.20	23.56
Value-c-g-value rough. ($)	22.92	25.98	17.36	16.07
No. years returns negative	5	3	6	7
" " " $ 0 - $10	3	5	5	6
" " " $10 - $20	8	5	9	7
" " " $20 - $50	11	14	8	9
" " " above $50	4	4	3	2
Returns/$ feed cost	1.60	1.69	1.44	1.39
Returns/$ total cost	.1735	.1968	.1313	.1198

Table 24. Feed fed, costs and returns for cow herds, A, B, C and D.

Program Wintering Phase	A 6 mo.	B 6 mo.	C 6 mo.	D 6 mo.
Total feed per phase (per calf basis)				
Silage (tons)	--	--	2.48	2.48
Alfalfa hay (tons)	1.10	--	1.10	--
Prairie hay (tons)	1.10	1.98	--	1.10
Corn (bu.)	3.30	--	--	--
Soybean oil meal (cwt.)	--	2.64	--	1.10
Grazing phase				
Pasture	6 mo.	6 mo.	6 mo.	6 mo.
Cost ($): wintering phase				
Silage	--	--	11.02	11.02
Alfalfa hay	16.17	--	16.17	--
Prairie hay	11.01	19.82	--	11.01
Total roughage	27.18	19.82	27.19	22.03
Corn	3.17	--	--	--
Soybean oil meal	--	8.25	--	3.44
Total wintering cost	30.35	28.07	27.19	25.47
Cost ($): grazing phase	12.25	12.25	12.25	12.25
Roughage cost, both phases	39.43	32.07	39.44	34.28
Total feed cost, both phases	42.60	40.32	39.44	37.72
Feed cost/cwt. calf produced	10.02	9.49	9.28	8.88
Selling value of calf	64.70	64.70	64.70	64.70
Ending wt. (lbs.)	425	425	425	425
Ending grade (%)	50 Ch, 50 Gd	50 Ch, 50 Gd	50 Ch, 50 Gd	50 Ch, 50 Gd
Month for end. grade	Nov.	Nov.	Nov.	Nov.
Ending price ($)	15.22	15.22	15.22	15.22
Value-value of comm. feed ($)	--	56.45	--	61.26
Value-c-value of grain ($)	61.53	--	--	--
Value-c-g-value of rough. ($)	22.10	24.38	25.26	26.98
No. years returns negative	5	3	4	2
" " " $ 0 - $10	5	7	5	7
" " " $10 - $20	9	8	7	6
" " " $20 - $50	8	9	10	11
" " " above $50	4	4	5	5
Value calf/$ total feed cost	1.52	1.60	1.64	1.72
Returns/$ total feed cost	.5189	.6047	.6405	.7155

Table 25. Feed fed, costs and returns for cow-herd, creep-fed calves, a, b and c.

Program and total no. days	a (376)	b (377)	c (390)
Number head	50	46	46
Daily Ration: creep, days	211	212	212
Milo (lbs.)	1.64	1.24	--
Cottonseed meal (lbs.)	--	.25	--
Daily Ration: fatten, days	165	165	178
Silage (lbs.)	18.27	18.45	18.75
Alfalfa hay (lbs.)	.63	.63	.68
Ground alfalfa (lbs.)	.09	.09	.11
Milo (lbs.)	13.41	12.85	12.61
Cottonseed meal (lbs.)	1.35	1.35	1.36
Total Feed: calves			
Silage (tons)	1.51	1.53	1.67
Alfalfa hay (tons)	.05	.05	.06
Ground alfalfa (tons)	.01	.01	.01
Milo (bu.)	44.22	42.52	40.05
Cottonseed meal (cwt.)	2.23	2.86	2.41
Value of Feed: ($) silage	6.73	6.80	7.37
Alfalfa hay	.77	.77	.86
Ground alfalfa	.12	.12	.16
Pasture	7.82	7.82	7.82
Total roughage	15.44	15.51	16.21
Milo	38.12	36.66	34.52
Cottonseed meal	6.70	8.60	7.25
Salt and minerals	.05	.05	.05
Total all feed	60.31	60.82	58.03
Total Feed: cows, calves			
Silage (tons)	3.99	4.01	4.15
Alfalfa hay (tons)	1.15	1.15	1.16
Ground alfalfa (tons)	.01	.01	.01
Milo (bu.)	44.22	42.52	40.05
Cottonseed meal (cwt.)	2.23	2.86	2.41
Value All Feed ($) silage	17.75	17.82	18.39
Alfalfa hay	16.94	16.94	17.03
Ground alfalfa	.12	.12	.16
Pasture	20.07	20.07	20.07
Total roughage	54.88	54.95	55.65
Total All Feed	99.75	100.25	97.47
Selling value of calf ($)	136.95	141.28	135.47
Ending wt. (lbs.)	857	880	863
Ending grade (%)	11 Pr, 89 Ch	16 Pr, 84 Ch	92 Ch, 8 Gd
Month for end. price	Apr.	Apr.	Apr.
Ending price ($)	15.98	16.05	15.70
Value-cost comm. feed ($)	130.20	132.62	128.17
Value-c-cost of grain ($)	92.08	95.97	93.65
Value-c-g-cost of roughage ($)	37.20	41.02	38.00
No. years returns negative	3	3	3
" " " $ 0 - $10	2	2	2

Table 25. (conc'l.)

Program and total no. days	a (376)	b (377)	c (390)
No. years returns $10 - $20	5	2	4
" " " $20 - $50	14	16	15
" " " above $50	7	8	7
Value calf/$ total feed cost	1.37	1.41	1.39
Returns/$ total feed cost	.3729	.4091	.3899

Table 26. Feed fed, costs and returns for cow-herd, creep-fed calves, d, e and f.

Program and total no. days	d (400)	e (395)	f (441)
Number head	12	13	13
Daily Ration: creep, days	288	283	286
Milo (lbs.)	4.13	3.16	--
Cottonseed meal (lbs.)	--	.65	--
Daily Ration: fatten, days	112	112	155
Silage (lbs.)	23.98	22.90	25.33
Alfalfa hay (lbs.)	2.00	2.00	2.00
Milo (lbs.)	11.33	11.33	11.07
Cottonseed meal (lbs.)	1.00	1.00	1.00
Total Feed: calf, sil. (tons)	1.34	1.28	1.96
Alfalfa hay (tons)	.11	.11	.16
Milo (bu.)	43.89	38.03	30.64
Cottonseed meal (cwt.)	1.12	3.17	1.55
Value of Feed: ($) silage	5.98	5.71	8.75
Alfalfa hay	1.65	1.65	2.28
Pasture	7.82	7.82	7.82
Total roughage	15.45	15.18	18.85
Milo	37.84	32.79	26.41
Cottonseed meal	3.36	9.53	4.66
Total all feed	56.65	57.50	49.92
Total Feed: cow, calf, sil. (tons)	3.82	3.76	4.44
Alfalfa hay (tons)	1.21	1.21	1.26
Milo (bu.)	43.89	38.03	30.64
Cottonseed meal (cwt.)	1.12	3.17	1.55
Value All Feed ($) silage	17.00	16.73	19.77
Alfalfa hay	17.82	17.82	18.45
Pasture	20.07	20.07	20.07
Total roughage	54.89	54.62	58.29
Total All Feed	96.09	96.94	89.36
Selling value of calf ($)	146.08	140.77	148.40
Ending wt. (lbs.)	895	870	885
Ending grade (%)	75 Ch, 25 Gd	69 Ch, 31 Gd	100 Ch
Month for end. price	Oct.	Oct.	Dec.
Ending price ($)	16.32	16.18	16.77
Value-cost comm. feed ($)	142.72	131.24	143.74
Value-c-cost of grain ($)	104.88	98.45	117.33
Value-c-g-cost of roughage ($)	49.99	43.83	59.04
No. years returns negative	3	3	1
" " " $ 0 - $10	2	2	4
" " " $10 - $20	2	4	2
" " " $20 - $50	12	13	10
" " " above $50	12	9	14
Value calf/$ total feed cost	1.52	1.45	1.66
Returns/$ total feed cost	.5202	.4521	.6607

Table 27. Feed fed, costs and returns for cow-herd, creep-fed calves, g and h.

Program and total no. days	g (388)	h (426)
Number head	17	19
Daily Ration: creep, days	278	278
Milo (lbs.)	3.98	--
Daily Ration: fatten, days	110	148
Silage (lbs.)	5.45	8.90
Ground alfalfa (lbs.)	4.05	4.06
Milo (lbs.)	13.92	12.18
Total feed: calf, sil. (tons)	.30	.66
Ground alfalfa (tons)	.22	.30
Milo (bu.)	47.11	32.19
Value of Feed: ($) silage	1.34	2.93
Ground alfalfa	3.67	4.95
Pasture	7.82	7.82
Total roughage	12.83	15.70
Milo	40.61	27.75
Total all feed	53.44	43.45
Total Feed: cow, calf, sil. (tons)	2.78	3.14
Alfalfa hay (tons)	1.10	1.10
Ground alfalfa (tons)	.22	.30
Milo (bu.)	47.11	32.19
Value All Feed ($) silage	12.36	13.95
Alfalfa hay	16.17	16.17
Ground alfalfa	3.67	4.95
Pasture	20.07	20.07
Total roughage	52.27	55.14
Total All Feed	92.88	82.89
Selling value of calf ($)	140.14	132.59
Ending wt. (lbs.)	821	824
Ending grade (%)	12 Pr, 82 Ch, 6 Gd	74 Ch, 26 Gd
Month for end. price	Oct.	Dec.
Ending price	17.07	16.09
Value-cost of grain	99.53	104.84
Value-g-cost of roughage	47.26	49.70
No. years returns negative	3	1
" " " $ 0 - $10	2	5
" " " $10 - $20	2	3
" " " $20 - $50	13	13
" " " above $50	11	9
Value calf/$ total feed cost	1.51	1.60
Returns/$ total feed cost	.5088	.5996

Table 28. Feed fed, costs and returns for cow-herd, creep-fed calves, i, j and k.

Program and total no. days	i (405)	j (403)	k (402)
Number head	19	20	19
Daily Ration: creep, days	284	282	281
Milo (lbs.)	3.66	3.13	--
Cottonseed meal (lbs.)	--	.64	--
Daily Ration: fatten, days	121	121	121
Silage (lbs.)	18.18	17.12	21.61
Milo (lbs.)	13.03	13.03	12.57
Cottonseed meal (lbs.)	1.38	1.38	1.38
Total Feed: calf, sil. (tons)	1.10	1.04	1.31
Milo (bu.)	46.73	43.35	27.16
Cottonseed meal (cwt.)	1.67	3.80	1.67
Value of Feed: ($) silage	4.90	4.61	5.82
Pasture	7.82	7.82	7.82
Total roughage	12.72	12.43	13.64
Milo	40.28	37.37	23.42
Cottonseed meal	5.03	11.42	5.02
Salt and minerals	.05	.05	.05
Total all feed	58.08	61.27	42.13
Total Feed: cow, calf, sil. (tons)	3.48	3.52	3.79
Alfalfa hay (tons)	1.10	1.10	1.10
Milo (bu.)	46.73	43.35	27.16
Cottonseed meal (cwt.)	1.67	3.80	1.67
Value All Feed ($) silage	15.92	15.63	16.84
Alfalfa hay	16.17	16.17	16.17
Pasture	20.07	20.07	20.07
Total roughage	52.16	51.87	53.08
Total All Feed	97.52	100.71	81.57
Selling value of calf ($)	138.28	141.85	132.98
Ending wt. (lbs.)	850	870	841
Ending grade (%)	73 Ch, 27 Gd	75 Ch, 25 Gd	58 Ch, 42 Gd
Month for end. price	Nov.	Nov.	Nov.
Ending price ($)	16.27	16.30	15.81
Value-cost comm. feed ($)	133.20	130.38	127.91
Value-c-cost of grain ($)	92.92	93.01	104.49
Value-c-g-cost of roughage ($)	40.76	41.14	51.41
No. years returns negative	4	4	1
" " " $0 - $10	3	3	4
" " " $10 - $20	2	2	2
" " " $20 - $50	13	13	13
" " " above $50	9	9	11
Value calf/$ total feed cost	1.42	1.41	1.63
Returns/$ total feed cost	.4180	.4085	.6303

Table 29. Summary of results for various feeding programs.

Program	No. of head	Lbs. gain/ head	Feed cost/cwt. gain	Av. annual profit/ head	Low. annual profit/head yr.	Low. annual profit/head amount	High. annual profit/head yr.	High. annual profit/head amount	Year nearest Av. profit yr.	Year nearest Av. profit amount	Return/$ feed cost	Return/$ total cost
Wintered steers:												
B	10	132	10.23	9.84	53	-28.43	51	54.90	37	9.70	1.73	.1039
C	40	197	9.27	10.61	34	- 7.52	51	50.64	46	9.85	1.58	.1130
D	40	216	7.58	15.40	53	-11.69	51	69.51	29	15.36	1.94	.1674
E	47	238	8.88	18.80	34	- 4.83	51	82.90	46	19.37	1.89	.2165
Wintered and grazed steers:												
A	31	364	5.81	21.85	53	-15.32	50	100.19	44	22.36	2.03	.2571
C	30	393	6.40	21.72	53	-22.90	50	103.39	44	20.76	1.86	.2436
D	30	413	7.02	20.77	53	-24.05	50	104.78	40	19.93	1.72	.2234
G	49	346	6.20	22.32	53	-24.29	50	99.81	54	21.06	2.04	.2512
Wintered and full fed steers:												
E	5	583	12.26	28.68	34	-18.84	48	143.53	35	27.43	1.40	.2421
J	5	472	12.69	3.75	52	-59.50	50	72.17	32	3.71	1.06	.0290
K	20	507	12.03	23.29	36	-18.92	48	119.63	44	25.09	1.38	.1727
Deferred fed steers:												
B	50	630	10.69	33.41	34	- 7.75	50	116.11	35	35.21	1.50	.2676
E	150	611	10.57	34.16	34	- 8.17	50	114.91	35	36.53	1.53	.2728
Deferred fed heifers:												
A	19	365	13.74	9.88	36	-23.43	48	105.82	54	9.81	1.20	.0885
B	59	494	12.41	22.52	34	-15.76	48	108.94	55	21.96	1.38	.1844
C	30	424	11.15	20.20	34	-10.86	48	93.56	55	21.30	1.43	.1882
D	30	457	12.11	17.15	34	-16.66	48	92.71	55	16.76	1.31	.1482
Full fed steers:												
A	30	481	11.44	36.65	36	-16.77	48	154.07	52	35.21	1.67	.3061
C	27	315	14.59	27.36	43	-12.87	49	99.70	31	26.90	1.60	.2001
D	10	446	12.17	37.48	36	-20.48	48	150.31	32	36.67	1.69	.3081

Table 29. (con't.)

Program	No. of head	Lbs. gain/ head	Feed cost/cwt. gain	Av. annual profit/ head	Low. annual profit/head yr.	Low. annual profit/head amount	High. annual profit/head yr.	High. annual profit/head amount	Year nearest Av. profit yr.	Year nearest Av. profit amount	Return/ $ feed cost	Return/ $ total cost
Full fed steers (con't.):												
19	10	432	12.21	33.81	36	-19.87	48	145.87	32	32.43	1.64	.2788
21	9	428	12.22	36.81	36	-20.08	48	151.40	32	36.77	1.70	.3033
15	10	369	14.67	32.16	53	-21.51	51	111.82	39	34.49	1.59	.1949
16	10	323	14.49	31.47	53	-22.14	51	104.32	39	31.80	1.67	.1990
17	10	297	12.28	24.28	53	-32.79	51	95.21	43	23.37	1.67	.1633
18	10	178	13.57	3.19	53	-61.98	35	45.87	39	4.98	1.13	.0236
22	10	390	13.62	15.90	53	-22.03	48	88.04	47	14.12	1.30	.0981
23	10	405	13.48	19.92	34	-19.93	48	96.21	47	17.93	1.37	.1217
24	10	443	13.37	34.27	34	-15.89	48	125.07	32	34.94	1.58	.2037
25	19	392	15.74	12.88	53	-34.70	51	75.78	25	13.02	1.21	.0730
I	30	279	14.23	11.33	43	-17.57	46	51.39	25	11.66	1.29	.0748
II	30	365	14.86	37.41	53	-10.72	50	109.45	27	36.98	1.69	.2127
III	130	372	14.08	37.75	53	- 7.84	50	110.23	27	38.01	1.72	.2159
IV	20	372	14.44	26.69	34	-15.93	48	104.28	39	27.90	1.50	.1610
Full fed heifers:												
E	35	291	13.79	17.40	37	- 7.18	50	69.47	38	16.69	1.43	.1626
F	30	364	13.13	14.93	36	-19.87	48	105.02	52	13.07	1.31	.1467
G	30	395	13.03	18.27	36	-20.74	48	122.59	45	17.43	1.35	.1565
H	10	202	14.61	11.84	36	- 9.04	48	79.69	46	13.07	1.40	.1146
7	10	289	12.67	12.05	34	-12.75	48	50.80	40	11.62	1.33	.1145
8	10	305	13.34	16.43	43	-13.20	48	64.58	40	15.52	1.40	.1517
9	10	330	12.67	25.86	25	- 7.49	48	86.87	37	26.93	1.62	.2350
10	10	315	12.49	21.73	25	- 8.10	48	75.34	27	21.65	1.55	.2012
3	10	167	15.23	6.90	43	-10.32	48	50.99	25	5.46	1.27	.0627
4	10	179	14.82	13.96	43	- 5.88	48	69.07	38	13.84	1.53	.1255
5	10	213	13.60	18.61	36	- 4.81	48	81.31	35	18.66	1.64	.1642
6	10	162	14.91	10.10	43	- 8.21	48	57.56	41	10.17	1.42	.0929
11	9	276	13.73	22.92	43	- 8.95	48	94.99	32	22.88	1.60	.1735
12	10	275	13.71	25.98	43	- 6.74	48	101.63	32	26.34	1.69	.1968
13	10	290	13.48	17.36	43	-17.29	48	78.64	27	16.94	1.44	.1313
14	10	290	14.04	16.07	43	-18.16	48	77.53	42	15.72	1.39	.1198

Table 29. (conc'l.)

Program	No. of head	Lbs. gain/ head	Feed cost/cwt. gain	Av. annual profit/ head	Low. annual profit/head yr.	Low. annual profit/head amount	High. annual profit/head yr.	High. annual profit/head amount	Year nearest Av. profit yr.	Year nearest Av. profit amount	Return/ $ feed cost	Return/ $ total cost
Cow herd-creep fed calves:												
a	50	779	11.64	37.20	34	-33.83	51	151.37	44	35.83	1.37*	.3729
b	46	805	11.39	41.02	34	-32.23	51	160.15	44	39.32	1.41	.4091
c	46	788	11.29	38.00	34	-33.01	51	154.15	44	37.16	1.39	.3899
d	12	824	10.74	49.99	34	-24.45	48	157.10	27	49.71	1.52	.5202
e	13	797	11.14	43.83	34	-26.44	48	152.37	55	42.68	1.45	.4521
f	13	811	10.10	59.04	34	-12.07	50	190.54	53	60.60	1.66	.6607
g	17	748	11.31	47.26	34	-22.83	48	162.88	55	44.33	1.51	.5088
h	19	754	10.06	49.70	34	-14.73	50	173.12	27	49.35	1.60	.5996
i	19	779	11.47	40.76	34	-27.60	50	145.87	40	41.89	1.42	.4180
j	20	798	11.58	41.14	34	-27.58	50	146.20	40	41.74	1.41	.4085
k	19	766	9.70	51.41	34	-17.21	50	160.15	28	51.03	1.63	.6303
Cow herd:												
A	--	425	10.02	22.10	34	-18.33	50	105.70	28	22.44	1.52	.5189
B	--	425	9.49	24.38	34	-11.58	50	108.44	45	24.60	1.60	.6047
C	--	425	9.28	25.26	34	-16.45	50	111.01	40	24.84	1.64	.6405
D	--	425	8.88	26.98	34	-11.67	50	113.25	40	27.39	1.72	.7155

*In the following programs, this column represents the value of calf per dollar of total feed cost.

ANNUAL AND AVERAGE PROFITABILITY OF VARIOUS ALTERNATIVES AMONG BEEF CATTLE SYSTEMS FOR NORTHEAST KANSAS, 1925-1955

by

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B. S., Kansas State College
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This study was concerned with the production of beef cattle in Northeast Kansas and an attempt was made to determine the profitability of alternative ways of handling different systems for that area. The study covered the period from 1925 to 1955 with annual budgets constructed for each year, including beef prices and feed costs appropriate for the system and year. The budgeting process was utilized to determine annual costs and returns for the various beef cattle feeding programs. The budgets were constructed to determine returns per dollar of feed costs, returns per dollar of total costs, and profit. Beef cattle feeding trials carried out by the Kansas Agricultural Experiment Stations at Manhattan and Hays provided the necessary input-output relations. These data are useful for studies in farm planning.

The budgets were constructed to include calculations of the selling value of the animal minus the cost of the animal; selling value minus the cost of animal and value of commercial feed; selling value minus cost of animal, value of commercial feed and value of farm raised grain; selling value minus cost of animal, value of commercial feed, value of farm raised trains and value of farm raised roughage. This last calculation represented profit or the return above the cost of the animal and feed. A separate budget was constructed for each phase as in programs of more than one phase, the results of one phase were likely to be contingent on how the preceding phase was handled.

Cow herds with creep fed calves were found to be the most profitable beef feeding program for the period studied. However, programs in which no grain was fed until the calves were weaned produced the largest profit. The results for the creep feeding programs are not entirely comparable with those for the other systems since no charge was included for the replacement of the cow, whereas for purchased systems the cost of the animal was used.

Full fed steers of lighter weights were the second most profitable feeding program. The average annual return was over $30.00 per head in most cases, and losses were small as a rule. The heavier full fed steers produced somewhat erratic returns with losses being larger in most cases.

Deferred fed steers also produced an average annual return of over $30.00 per head. One rather apparent characteristic of the deferred fed steer alternative was the smallness of losses in those years losses were incurred. The greatest loss from deferred fed steers was slightly more than $8.00 per head in 1934.

Full fed heifers did not produce profit figures comparable to full fed steers, but neither did they lose as much money in years of losses as did steers.

Wintered and grazed steers produced an average profit of slightly over $20.00 per head. This feeding program appeared to be the fourth most profitable. An apparent characteristic of this program was the high return per dollar of feed cost. This may have been due to the low cost gains derived from pasture.

Although wintered steers produced about the lowest profits of the programs studied, they still produced a rather high return per dollar of feed cost. This was apparently due to the rather low cost of feeds used for wintering.

Profit realized from deferred fed heifers and wintered and full fed steers appeared to be rather erratic. In some cases losses were very high and in others profits approached $30.00 per head.

In analyzing the various systems in regard to returns per dollar of total cost it was found that the same systems which produced the greatest profit were also the same systems which produced the largest return per dollar of total cost.