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Baby beef production

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BULLETIN NO. 181

BABY BEEF PRODUCTION

A group of prospective baby beefs. Quality, condition and uniformity are outstanding.

AGRICULTURAL EXPERIMENT STATION
IOWA STATE COLLEGE OF AGRICULTURE
AND MECHANIC ARTS

ANIMAL HUSBANDRY SECTION

AMES, IOWA
BABY BEEF PRODUCTION POINTERS

1. Cows for the purpose of raising calves for baby beef purposes are a part of the livestock equipment necessary for maximum production. They are maintained for a part of the winter on feeds that would otherwise be wasted on a grain farm.

2. They afford a method of marketing a large amount of rough feed at a profit.

3. Their calves are heavier at weaning time than calves purchased on the market and are ready to go right along on feed because they are used to it. There is no interruption in gains made.

4. The home-grown calves of equal quality and breeding could not be replaced by market purchased calves for their production cost crediting all of the manure produced as is shown in the work of 1914, 1915, and 1916.

5. Good beef type cows may be economically maintained on adaptable farms in the corn belt for "baby beef" production.

6. Bulls possessing the best of beef conformation and breeding should be used.

7. Careful selection of prospective breeding heifers should be followed and the elimination of unprofitable cows consistently and persistently practiced.

8. A high percentage of calves, preferably over 85 and much better still if over 90 per cent, should be sought for.

9. If calves have been on heavy grain ration during the winter, they can be, in many respects advantageously, fed out in dry lot, during the following summer, as compared to pasture.

10. Baby beeves must be made prime to sell for the highest price.

11. It is good practice to market the baby beef heifers earlier than the steers, say from 750 to 900 pounds.

12. Baby bees should not be fed to a greater weight than 1000 pounds unless sufficient margin is in sight to cover increased cost of gains.

13. Heifers intended for breeding purposes to drop calves as two year olds should be liberally fed through the first winter; on good pasture the second summer and maintained in thrifty condition during the second winter. Corn silage and alfalfa hay will be sufficient feed throughout the second winter.
BABY BEEF PRODUCTION

BY W. H. PEW AND JOHN M. EVVARD *

Methods employed and results secured in baby beef production work at Walnut Ridge Stock Farm, E. M. Cassady and Son, proprietors, Whiting, Iowa, with the Animal Husbandry Section of the Iowa Agricultural Experiment Station co-operating.

The ranch cattle owner has reduced the selling age of his steers from four and five years to two-year-olds, yearlings, and to a relatively large extent, calves, depending upon conditions of climate and feed, and demands from feeders of the corn belt.

The corn belt farmer contends with high priced land, feed and labor. Outside of the field of purebred beef cattle production his operations are very largely limited to the feeding of cattle purchased from the range, usually thru the central market. Some farmers have been raising their own cattle for feeding purposes. They find the conditions of high priced land, feed, and labor favorable in some respects to baby beef production.

The change to baby beef production from the making of the older, heavier farm raised bullock has been quite widely advocated by experiment station and government authorities and baby beefes have been successfully raised and finished by some cornbelt farmers. Walnut Ridge Stock Farm, Whiting, Iowa, owned by E. M. Cassady & Son, has produced baby beeves for the past 11 years. The immediate questions to be answered are, "Does it pay?" and "How is it done?" An answer was sought in the cooperative work at Walnut Ridge Stock Farm, reported in this bulletin.

It should be understood at the outset that when reference is made to the term "baby beef," prime, fat, early maturing cattle are meant — cattle ranging from about 12 to 21 months of age and weighing in the neighborhood of 800 to 1200 pounds.

HISTORY OF COOPERATIVE WORK

In 1912 the Animal Husbandry Section planned to gather data on beef production costs in Iowa. The Junior author when

* With the collaboration of Raymond Cassady, junior partner, Walnut Ridge Stock Farm; Alfred B. Caine, assistant professor of animal husbandry, Iowa State College; D. R. Forrester, former graduate student in Animal Husbandry; and Russell Dunn, assistant in Animal Husbandry, Iowa Agricultural Experiment Station.
making a visit to Walnut Ridge Farm found that the Cassadys were keeping some records of costs for their own use. They had previously followed the practice of keeping some of their cattle over and fattening them out as two-year-olds. Thru these records they had become thoroughly convinced that under their conditions, typical of northwestern Iowa, the "babies'" outgained and made cheaper gains, ate less feed and made more money than the older cattle. In other words, it had been found to be a losing proposition, relatively speaking, to carry calves as stockers over the first winter and second summer to be fattened the second winter and third summer. It has proved to be a much better proposition to keep the calf fat on the calves, and to fatten them out as quickly as possible, making baby beeves of them and selling the fat 1000 to 1200 pound cattle at the early age of 18 to 20 months.

In the fall of 1912, 31 calves were weaned to be carried over until the fall of 1913. It was agreed that the Station should have access to the records and accordingly plans were laid for fattening these calves.

With the encouragement of Director C. F. Curtis and agreement of W. H. Pew and J. M. Evvard, representing the Experiment Station, and R. W. Cassady and E. M. Cassady, representing the Walnut Ridge Stock Farm, the main cooperative beef production experiment was started in the fall of 1913. R. W. Cassady, with the farm manager, Ward Minor, and herdsman, were to keep data on feed weights, etc.; representatives from the Animal Husbandry Section were to make visits to the farm from time to time, help in planning the tabulation of data, watch the progress of the experiment, take weights of cattle, etc., etc.

**OBJECTS OF THE EXPERIMENT**

The objects of this cooperative experiment were sevenfold:

I. To determine the itemized cost for a series of years of maintaining a beef breeding herd of grade Hereford cows and sires, annually taking the cows from the time of the weaning of their calves in November thru the entire productive year until their calves were weaned again, or, from weaning time one year to weaning time the next fall.

II. To determine the total production cost of calves up to weaning time.

III. To determine the cost of producing heifers carried to 18 months of age.

IV. To compare the cost of home grown calves with those purchased on the open market.

V. To determine the total feed required and total cost of feeding and handling calves to be marketed as baby beeves.
VI. To determine if gains made in the dry lot thru the summer are as economical as those made on pasture.

VII. To determine the ultimate profit or loss margin per baby beef on the entire operation, covering producing, feeding, management and marketing.

**METHODS OF EXPERIMENTATION**

**ANIMALS USED**

The breeding herd, maintained at from 75 to 90 head, consisted of older cows and heifers, all home grown. They were high grade Herefords, well marked, conforming to good beef type. They represented the results of persistent grading-up for 25 years, thru the use of good bulls and the selection of the best females of each year's calf crop for the breeding herd. Cows that would not produce and raise their calves well were culled out each year for market and replaced by the home raised two-year-old heifers.

The bulls used were, for the most part, selected from the group of young bulls produced in the pure bred Hereford herd of Walnut Ridge Stock Farm, but in some years included an older bull or two. These bulls were carefully selected and represented a desirable type for producing baby beef calves. They were low set and blocky, showing natural fleshing characteristics, all prime requirements for satisfactory service in a high grade herd used for baby beef production. The most successful baby beef

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**Fig. 1.** The type of bulls that sired the kind of calves required in successful baby beef making. Note their thickness and quality and breeding.
producers keep clearly in mind that the bull is the improver of the herd and hence use only good ones.

Thru the use of good bulls, most careful selection and strict culling of undesirable females, the Walnut Ridge herd has been brought to its present high state of excellence.

**MANAGEMENT**

The methods of management during the cooperative period of cost data collection did not vary materially except as regards the number of bulls used and in the age of breeding the heifers.

The usual practice has been to turn from 3 to 5 bulls, depending upon their age and vigor, with the entire herd of cows about the middle of June to first of July. Some years the herd was divided into three groups, each placed in separate pastures with one bull. The most satisfactory calves were dropped in late March, April and May. Those dropped late in June did not acquire the weight desired; the late calves did poorly during the heavy fly season in hot middle to late summer. For this reason the plan has been adopted to take the bulls away from the cows early in September. All cows coming in season after this date are put in the feed lot and fattened for market.

The prospective breeding heifers (now calves) were put in the dry lot with the steer calves in the fall and carried thru the winter. It was found to be of advantage to give the young growing heifer calves liberal feed so as to secure plenty of growth. In the spring as yearlings they were turned to pasture and after a month or so they were put with the breeding herd, being bred to calve in the late spring shortly after two years of age. Growthy heifers can profitably calve as two-year-olds. If the heifers have not been well cared for so as to make good growth they should not be bred until they are two, to calve at about three years of age.

The bull calves intended for baby beeves and heifers kept for breeding purposes ran with their dams until in November, when they were weaned; they received some grain in separate yards or creep after August. Soon after weaning all calves were dehorned and the bull calves were castrated.

With the breeding season over in August or September, the herd bulls were taken from the herd and kept in separate lots or pastures.

**WINTER RATIONS FED TO BREEDING COWS**

The herd of breeding cows was kept under average farm conditions, the purpose of the Cassadys being to keep the cows as economically as possible, yet at the same time maintain them in a strong, vigorous condition, not necessarily fat, so that a strong crop of calves in the spring would result. The feeds used during the winter periods were the cheap feeds of the ordinary corn belt farm.
The winter record periods were designated as follows:

a. Winter of 1913-14 from November 21, 1913 to April 6, 1914, a period of 137 days.

b. Winter of 1914-15 from November 22, 1914 to April 20, 1915, a period of 150 days.

c. Winter of 1915-16 from November 21, 1915 to May 16, 1916, a period of 177 days.

A description of the feeds and cost for the individual winters is as follows:

a. Winter 1913-14, 79 cows in herd. From November 21 to December 7, 1913, the cows were pastured in clover and timothy meadow aftermath; December 8 to December 26, they were pastured in corn stalks; December 27 to January 23, 1914, they were run in corn stalks and fed additionally an average of 13.24 pounds of corn silage per cow per day; January 24 to January 26, 1914, they were allowed corn silage and alfalfa hay, an average of 19.31 pounds of corn silage and 19.17 pounds alfalfa per cow per day; January 23 to February 19, they were given an average daily feed per cow of 20.27 pounds corn silage and 19.17 pounds alfalfa hay; February 20 to April 6, they were fed an average daily feed per cow of 19.16 pounds corn silage and 16.56 pounds clover timothy hay. The actual valuations of feeds were as follows:

1. Meadow aftermath, 75c per acre.
2. Corn stalks, 50c per acre.
3. Alfalfa hay (ordinary home stacked), $10.00 per ton.
4. Clover-timothy (mixed) hay, $8.00 per ton.
5. Corn silage, $4.00 per ton.

The average daily cost during the winter period of 137 days was 7.8c per cow, or a total winter cost of $10.74 per cow. The average weight per cow at the time of weaning the calves, November 21, on entering the winter period was 1037.14 pounds; this included the aged cows, two-year-old heifers and yearling heifers all of which had been bred to calve the following spring. On April 6, 1914, the end of the winter period when they were turned to grass, it is interesting to note that they weighed much more or an average of 1145.24 pounds, making during the winter time an average daily gain of .806 pounds.

b. Winter 1914-15. The herd of cows, numbering 98 head, consisted of aged cows (three and over), two-year-old heifers, and yearling heifers, all of which were due to calve the following spring. The feeds for the period were as follows: November 22 to December 9, 1914, they were pastured on clover and timothy meadow aftermath; December 10 to January 26, 1915, they were run in corn stalks; January 27 to February 9, they were still in the corn stalks and were fed an average daily feed per cow of 29.22 pounds of silage; February 10 to 22, they were allowed an average daily feed of 29.22 pounds of silage and 19.63
Fig. 2. A typical cow of the grade herd in winter condition.

pounds of alfalfa hay; February 23 to April 20, they were given an average daily feed per cow of 29.22 pounds of corn silage and 8.21 pounds alfalfa hay.

The average daily cost of feed per cow during this winter was 6.3c, making a total cost of the cow for the winter period of 1914-15 of $9.44. The same price of feeds were used for 1914-15 as for 1913-14.*

The average weight per head of the aged cows on November 22, 1914, when the winter period was started, was 1078.15 pounds, for the two-year-olds, 1107.94 pounds, and the yearlings, 797.31 pounds. The average weight per head of the entire herd at this date was 1008.81 pounds. The gains made by the entire breeding herd were approximately the same as during the winter period of 1913-14.

c. Winter 1915-16. The herd of cows numbering 92 head, consisted of aged cows, two-year-old heifers and yearling heifers, all of which were due to calve the following spring. The management and feeding for the period were as follows: The win-

* Munger and Lloyd of the Farm Management Section, Iowa Agricultural Experiment Station, have compared prices of rough feeds on 965 Iowa farms in the year 1913-14, with prices on 832 Iowa farms for the year 1915-16, and they find that essentially the same prices ruled during both of these periods.
The season of 1915-16 was somewhat longer than that of the previous year, or 177 days as compared to 150 days. The breeding cows were taken from pasture November 21, 1915, and turned into the corn stalks and onto meadow aftermath. This was the sole ration until February 14, 1916, when they were started on corn silage and alfalfa hay and allowed amounts similar to other years, sufficient to keep them gaining nicely; the cows were fed in this manner until May 16, when they were turned to pasture. The average cost of keeping the cows during this winter period was $12.02 per head with an average daily cost per cow of 6.8 cents. The prices charged for feeds were the same as during the two previous years. Inasmuch as the cows eat largely rough, waste feed in the fall and winter the prices are considered a constant average for 1913-14, 1914-15, and 1915-16. In the spring of 1916 prices of corn increased rapidly but the cows ate September, 1915, priced corn in their winter silage ration for 1915-16. Corn stalks, aftermath, and rough discolored hay is considered as priced high enough for the three years.

**WINTER RATIONS FED TO SUMMER BREEDING COWS**

The herd of breeding cows was maintained during the summer time as cheaply as possible, depending upon bluegrass pasture generally, excepting during one year (1914) when the bluegrass pasture was severely dried up; corn silage was then used to tide the cows over until fall rains came. The cows themselves could, no doubt, have been maintained from the pasture alone but to insure a good milk flow, essential for the calves, the silage addition was necessary.

The summer periods are designated as follows:

a. Summer of 1914 from April 7 to November 21, a period of 229 days.

b. Summer of 1915 from April 21 to November 21, a period of 214 days.

c. Summer of 1916 from May 16 to November 21, a period of 189 days.

A description of methods employed in handling the cows through the summer time and cost for each summer is as follows:

a. **Summer of 1914.** Eighty-four cows in herd during the period. The entire 84 head of cows and heifers collectively averaged in weight on April 7, 1914, 1145.24 pounds. For the first seven days on pasture they were fed on an average of nearly 20 pounds of corn silage per head; April 14 to July 19, a period of 97 days, the cows were on pasture without additional feed; July 20 to November 16, the cows that were nursing calves were fed something over 20 pounds of corn silage per head daily as this was a season when the bluegrass pasture dried up severely about the 20th of July and continued dry until fall. This neces-
sitated a change of pasture for the yearling heifers so that the
cows could be fed silage when convenient without feeding the
heifers as well. In the fall of November 17, when the calves
were weaned the cows and the heifers were again all turned to­
gether.

At the end of the summer period the average weight per head
of the cows, two-year-olds, and yearlings was 1056.13 pounds.
It was found that the aged cows that had nursed calves had lost
140.34 pounds during the summer period. The two year old
heifers had gained 176.12 pounds per head and the yearling
heifers had gained 111.93 pounds. The cost for carrying the en­
tire herd of cattle thru the summer time was 7.06 cents per head
daily. For the cows suckling calves the cost was 8.07 cents per
head daily. The total cost for carrying the suckling cows with
calves thru the summer time, a period of 229 days, was $18.48
and for the heifers, $13.13 per head, or an average for both cows
suckling calves and heifers of $16.16 per head.

The valuation of feeds and pasture rental were as follows:
1. Corn silage, $4.00 per ton.
2. Pasture rental, $5.96 per acre.

b. Summer of 1915. The 96 head of cows and heifers were
turned to pasture April 21 and were not fed any extra feed dur­
ing the entire period, which ended November 21. The summer
of 1915 was a decidedly favorable season for pasture. The cows
and heifers at the end of the summer period, November 21,
weighed an average of 1046.10 pounds per head. The average
daily cost per cow was $6.35, or a total for the period of 214
days of $13.55 per cow.

c. Summer of 1916. This period extended from May 16 to
November 21, 189 days. The number of cows averaged thru
the season 86.6. The summer of 1916 was a good pasture season,
hence no extra feeding was required. The cost of pasturing was
5.9 cents per head daily, making a season’s cost per cow of
$11.23.

GAIN AND LOSS IN WEIGHTS OF COWS

It was difficult to keep accurate weights of the breeding cows
because of the distance they were pastured and wintered from
the central scales. However, during the summer period of 1914
it was found that the cows suckling calves lost on the average
per head about 140 pounds.

Only one winter weight record was kept, that being for Novem­
ber 21, 1913, to April 6, 1914, when the cows that were to calve
in the spring made a total winter gain of 109 pounds.

The weights of the cows that were available were not suffi­
cient for making a set of figures to be used in determining actual
loss or gain in valuation on account of loss or gain in weight.
SUMMARY OF COW KEEPING—BREEDING COWS

The largest factor in the cost of the calf at weaning time is the cost of cow's keep including feed and other expenses incidental to her maintenance.

In order that the complete cost of cow keep by years, including feed and other items, may be clearly brought out, the following table is given:

<table>
<thead>
<tr>
<th>TABLE I. SUMMARY OF COW KEEP—BREEDING COWS</th>
</tr>
</thead>
</table>

1913-1914

Feed cost (Winter—Nov. 21, 1913 to Apr. 6, 1914) .................................. $10.74
Feed cost (Summer—May 17, 1916 to Nov. 22, 1916) .............................. 11.23
Total feed cost 1913-14 ............................................................................. $29.22

Incidental Items
- Interest on money invested in cow .................................................. 3.07
- Labor caring for cow (man and horse) ............................................. 1.60
- Veterinary charges and mortality risk ............................................. 1.60
- Taxes on cow ..................................................................................... .25
- Interest on equipment, depreciation, upkeep on bunks, racks, fences, sheds, windmill, etc. ........................................... .75
- Taxes on pasture land, per cow ........................................................ 1.38
Total cost of cow keep, 1913-14 .................................................. $37.87

1914-15

Feed cost (Winter—Nov. 22, 1914 to Apr. 20, 1915) ................................ $9.44
Feed cost (Summer—Apr. 21, 1915 to Nov. 21, 1915) ............................... 13.55
Total feed cost, 1914-15 ............................................................................ $22.99

Incidental Items
- Interest on money invested in cow .................................................. 4.80
- Labor caring for cow (man and horse) ............................................. 1.60
- Veterinary charges and mortality risk ............................................. 1.70
- Taxes on cow ..................................................................................... .25
- Interest on equipment, depreciation, upkeep on bunks, racks, fences, sheds, windmill, etc. ........................................... .90
- Taxes on pasture land, per cow ........................................................ 1.40
Total cost of cow keep, 1914-15 .................................................. $33.64

1915-16

Feed cost (Winter—Nov. 21, 1915 to May 16, 1916) ................................ $12.02
Feed cost (Summer—May 17, 1916 to Nov. 22, 1916) ............................... 11.23
Total feed cost, 1915-16 ............................................................................. $23.25

Incidental Items
- Interest on money invested in cow .................................................. 3.40
- Labor caring for cow (man and horse) ............................................. 1.93
- Mortality risk ..................................................................................... 1.52
- Veterinary ......................................................................................... .28
- Taxes on cow ..................................................................................... .23
- Interest on equipment ....................................................................... .56
- Depreciation and up-keep ................................................................. .51
- Taxes on pasture land, per cow ........................................................ 1.38
Total cost of cow keep, 1915-16 .................................................. $33.06
Valuations were placed on the cows each year, giving a basis on which to figure the interest invested and mortality loss.

Labor for caring for the cows was determined from an accurate time record kept for man and horse — the man labor at 20 cents and horse labor at 12 cents per hour. Mortality risk, veterinary, taxes, interest on equipment, depreciation, and up-keep, were taken from the Cassady books and put on the basis of the average cow. These prices were held constant for the three years — 1913-14, 1914-15, and 1915-16. For 1916-17 and 1917-18, however, increases are in order.

**TABLE II. SHOWING FEEDS CONSUMED BY AN AVERAGE COW DURING A TYPICAL YEAR**

**Winter**

- .54 acres of clover and timothy aftermath—10 days (Nov. 1 to Nov. 18, 1915).
- 1.03 acres of corn stalks—86 days (Nov. 18, 1915 to Feb. 14, 1916).
- .3 tons of timothy hay—fed during extreme weather (Nov. 18, 1915, to Feb. 14, 1916).
- 1.03 tons of silage—92 days (Feb. 14 to May 16, 1916).
- .61 tons of alfalfa hay—92 days (Feb. 14 to May 16, 1916).

**Summer**

- Pasture for cow and calf for season from May 16 to November 18, 1916—182 days—2 acres.

15.6 pounds of salt for entire year.

One can refigure cow and calf costs by using his own feed prices, attaching same to feeds eaten as shown in table X and others.

**VALUE OF LAND AND PASTURE ACREAGE**

The land on which the crops were grown was valued at $200 per acre. The pasture land was valued from $110 to $150 per acre, it being somewhat lower than the land used for crops and some distance from the buildings. Each cow plus calf was allowed approximately two acres while at pasture.

The pasture rental was secured by using 5 per cent interest on the value of the acreage in pasture and dividing by the number of acres. In addition the cows pay the taxes.

220 acres valued at $110 per acre and 66 acres valued at $150 per acre. The value of the pasture land has increased during the past four or five years in proportion as has the value of the crop lands.

**SUMMER RATIONS FED TO CALVES**

The calves were permitted to run with the dams without grain until sometime in July or August, when they were started on grain consisting of shelled corn and whole oats in the proportion of half and half by weight. In order to get them started on the grain feed the cows and calves were all driven each morning to the large barn yard where the calves were separated into a smaller yard away from the cows. The corn and oats were fed
in open bunks. In only a few days the calves were eating the grain quite freely and from this time on to weaning in November they were fed according to appetite. The average daily feed of combined grains per calf for the period of beginning to eat grain to weaning time would be about 3.25 pounds.

Possibly the system giving calves access to grain at will in a pasture creep might have been preferable. This system has the advantage of permitting the calves to be with their mothers all day, and possibly might have saved some labor.

By weaning time in November the calves were on full feed. When the dams were taken away the calves scarcely noticed the change and were ready for feeding in the fattening lot.

**SUMMARY OF COST OF CALF AT WEANING TIME**

The data showing the cost of the calf at weaning time is set forth in the following table for crops of calves of 1914, 1915 and 1916:

<table>
<thead>
<tr>
<th>TABLE III. COST OF AVERAGE CALF FOR 1914</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cost of maintaining cow,* fall of 1913 to fall of 1914.</td>
</tr>
<tr>
<td>Bull service</td>
</tr>
<tr>
<td>Calf feed cost in creep</td>
</tr>
<tr>
<td>Mortality risk on calves</td>
</tr>
<tr>
<td>Labor in caring for calves</td>
</tr>
<tr>
<td>Total cost of calf at weaning time</td>
</tr>
<tr>
<td>Credit of 10 tons of manure at $1.50 per ton produced by cow and calf (estimated)**</td>
</tr>
<tr>
<td>Net production cost of 416 pound calf at weaning time in fall of 1914</td>
</tr>
</tbody>
</table>

*Cost of Average Calf in 1915*

| Total cost of maintaining cow,* fall of 1914 to fall of 1915 | $33.64 |
| Bull service | 2.06 |
| Calf feed cost while in creep | 3.89 |
| Mortality risk in calves | 3.95 |
| Labor in caring for calves | 0.85 |
| Total cost of calf at weaning time | $44.39 |
* Credit of 10 tons of manure at $1.50 per ton produced by cow and calf** | 15.00 |
| Net cost of 412 pound calf at weaning time in fall of 1915 | $29.39 |

*Cost of Average Calf in 1916*

| Total cost of maintaining cow,* fall of 1915 to fall of 1916 | $33.06 |
| Bull service | 2.00 |
| Calf feed cost while in creep | 3.76 |
| Mortality risk | 2.98 |
| Labor in caring for calves | 1.21 |
| Total cost of calf at weaning time | $43.01 |
* Credit of 10 tons of manure at $1.50 per ton produced by cow and calf** | 15.00 |
| Net cost of 412 pound calf at weaning time in fall of 1916 | $28.01 |

* See page 303, under “Calf Crop.”
** See explanation, page 302.
MANURE CREDIT

The credit that should be given per cow for manure produced during the year varies according to different authorities.

A number of tests quoted* by Thorne, Hickman, Williams, Carmichael and Ames, Ohio Experiment Station, from work done at Cornell, Minnesota and Ohio Experiment Stations, give an average credit to the cow of nearly 12.5 tons manure per year. Warren's "Farm Management" gives the cow credit for 13.5 tons of manure per year, valued, on a basis of approximate cost if purchased in fertilizers, at $31.20. Gardner's "Successful Farming" gives the cow a yearly credit of 14 tons of manure with a value of $30.92. Van Slyke's "Fertilizers" gives the cow credit for producing 13 1/2 tons of excrement per year per each 1000 pounds of live weight.

Experiments at the Iowa station by W. H. Stevenson of the Soils Section show manure produced by cattle to be worth, on pre-war time prices of crops, $2.50 per ton.

The cow with calf at foot is credited in this work very conservatively with 10 tons of manure, valued at $1.50 per ton, total of $15.00. This credit is low according to investigators but it is a valuation, which the Cassadys believe is justified as a farm value for the manure produced.

Stevenson of the Soils Section, Iowa Experiment Station, states as follows: "The manure valuation of $15.00 per cow per year represents a conservative feed lot and pasture valuation."

The whole question of manure credits from the farm management standpoint might be rehearsed in brief: It is to credit the cattle with the manure produced in the feed lot and which is returnable to the fields. The manure dropped on pasture is considered an indirect rental. Actual gross return, therefore, on pasture in this case was, first, 5 per cent interest on the average valuation of the land during the three years pasturing and second, the enhancement in value (sometimes called speculative margin). The manure in this case would, therefore, have to be charged to the pasture in a strict cost accounting scheme, if said manure is credited to the cows as in the tables.

If one wishes to consider the manure as an indirect rental, then approximately six tons at $1.50 a ton should be credited the cows. This difference in method of figuring would, therefore, make an addition of $6 to the net production cost of the calves necessary. This may easily be done if one so wishes.

The previous discussion brings out the fact that the cows are not heavily grain fed, hence a total valuation should be considerably less than that for manure produced by heavily grain fed cows.

CALF CROP

The three years' records show a calf crop at weaning time ranging from 84 per cent to 90 per cent based on the number of breeding cows turned with the herd bulls in the summer time. Some mortality among the cows was encountered, more especially with the young cows at calving time in the spring. This loss has all been taken into account (the item under "mortality risk") in the records of cost given hereinbefore. The mortality in the calf crop is likewise figured in.

The calves paid the total cost of maintaining the cows, therefore paid for the keep of a fraction more than one cow depending entirely upon the calf crop.

TABLE IV. COMPARISON OF PRODUCTION COST OF HOME GROWN CALVES WITH PURCHASE PRICE OF THOSE SECURED ON THE MARKET

Average weight of 1914 crop of calves at weaning time...........416 lbs.
Average weight of 1915 crop of calves at weaning time...........412 lbs.
Average weight of 1916 crop of calves at weaning time...........412 lbs.

Value of Calves at Weaning Time

Fall 1914
Value of average calf, 416 lbs. in weight at $8.50 per cwt............$35.36
Net production cost of calf....................................................33.81
Difference between net cost and purchasable value in favor of Home Grown .................................................................$ 1.55

Fall 1915
Value of calf, 412 lbs. at $8.25 per cwt....................................$33.99
Net production cost of calf......................................................29.39
Difference between net cost and purchasable value in favor of Home Grown .................................................................$ 4.60

Fall 1916
Value of calf, 412 lbs. at $9.00 per cwt....................................$37.08
Net production cost of calf......................................................28.01
Difference between net cost and purchasable value in favor of Home Grown .................................................................$ 9.09

These data indicate that the home-grown calves cannot be replaced by market calves for the same cost, considering quality and weight. The valuations that have been placed on the calves at weaning time in the falls of 1914, 1915 and 1916 are actual market valuations. There has not been a year in the three but that the Cassadays could have sold heifers and steers at weaning time, at an advance over the market valuation given.

The home-grown calves were easily put on feed directly after weaning. Calves that were purchased on the market, or in the west necessarily had a heavy shrink all of which must be accounted for at some time, in making up the total account. In
### TABLE V. HEIFERS DROPPED SPRING 1913

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net cost of heifer calf at weaning time, fall 1913</td>
<td>$33.81</td>
</tr>
<tr>
<td>Cost of feed per heifer while with baby beeves in feed lot, Nov. 21 to April 6</td>
<td>20.72</td>
</tr>
<tr>
<td>Cost of man and horse labor per heifer while with baby beeves in feed lot</td>
<td>.71</td>
</tr>
<tr>
<td>Cost of pasture per heifer, summer</td>
<td>12.33</td>
</tr>
<tr>
<td>Interest on heifer's feed</td>
<td>6.63</td>
</tr>
<tr>
<td>Cost of man and horse labor while with the cow herd during the summer</td>
<td>.33</td>
</tr>
<tr>
<td>Taxes on heifer</td>
<td>2.04</td>
</tr>
<tr>
<td>Depreciation on buildings, equipment, etc. per heifer</td>
<td>3.35</td>
</tr>
<tr>
<td>Risk or insurance</td>
<td>1.30</td>
</tr>
<tr>
<td>Total cost of heifer at 18 months of age</td>
<td>$70.38</td>
</tr>
<tr>
<td>Value of manure credited to heifer with the baby beeves and with the cow herd</td>
<td>11.61</td>
</tr>
<tr>
<td>Pork credited to heifer</td>
<td>1.75</td>
</tr>
<tr>
<td>Total credit</td>
<td>$13.36</td>
</tr>
<tr>
<td>Net cost of heifer at 18 months of age in the fall of 1914</td>
<td>$57.02</td>
</tr>
</tbody>
</table>

### Heifers Dropped Spring 1914

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net cost of heifer calf at weaning time, fall 1914</td>
<td>$29.39</td>
</tr>
<tr>
<td>Cost of feed per heifer while with baby beeves in feed lot</td>
<td>30.93</td>
</tr>
<tr>
<td>Cost of man and horse labor per heifer while with baby beeves in feed lot</td>
<td>1.04</td>
</tr>
<tr>
<td>Cost of pasture per heifer, summer</td>
<td>13.95</td>
</tr>
<tr>
<td>Cost of man and horse labor while with the cow herd</td>
<td>3.12</td>
</tr>
<tr>
<td>Interest on heifer's feed</td>
<td>9.35</td>
</tr>
<tr>
<td>Taxes on heifer</td>
<td>2.04</td>
</tr>
<tr>
<td>Depreciation on buildings, equipment, etc. per heifer</td>
<td>3.35</td>
</tr>
<tr>
<td>Risk or insurance</td>
<td>1.30</td>
</tr>
<tr>
<td>Total cost of heifer at 18 months of age</td>
<td>$78.30</td>
</tr>
<tr>
<td>Value of manure credited to heifer with the baby beeves and with the cow herd</td>
<td>11.61</td>
</tr>
<tr>
<td>Pork credited to heifer</td>
<td>1.75</td>
</tr>
<tr>
<td>Total credit</td>
<td>$13.36</td>
</tr>
<tr>
<td>Net cost of heifer at 18 months of age in the fall of 1915</td>
<td>$64.94</td>
</tr>
</tbody>
</table>

### Heifers Dropped Spring 1915

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net cost of heifer calf at weaning time, fall 1915</td>
<td>$28.01</td>
</tr>
<tr>
<td>Cost of feed per heifer while with baby beeves in feed lot</td>
<td>24.18</td>
</tr>
<tr>
<td>Cost of man and horse labor per heifer while with baby beeves in feed lot</td>
<td>7.00</td>
</tr>
<tr>
<td>Cost of pasture per heifer, summer</td>
<td>11.23</td>
</tr>
<tr>
<td>Interest on heifer's feed</td>
<td>6.00</td>
</tr>
<tr>
<td>Cost of man and horse labor while with the cow herd</td>
<td>3.20</td>
</tr>
<tr>
<td>Taxes on heifer</td>
<td>2.04</td>
</tr>
<tr>
<td>Depreciation on buildings, equipment, etc. per heifer</td>
<td>3.35</td>
</tr>
<tr>
<td>Risk or insurance</td>
<td>1.30</td>
</tr>
<tr>
<td>Total cost of heifer at 18 months of age</td>
<td>$66.89</td>
</tr>
<tr>
<td>Value of manure credited to heifer with the baby beeves and with the cow herd</td>
<td>11.61</td>
</tr>
<tr>
<td>Pork credited to heifer</td>
<td>1.84</td>
</tr>
<tr>
<td>Total credit</td>
<td>$13.45</td>
</tr>
<tr>
<td>Net cost of heifer at 18 months of age in the fall of 1916</td>
<td>$53.44</td>
</tr>
</tbody>
</table>

* See discussion on Manure Credit, page 302.
the estimated valuation of the calves weaned for instance in 1916, a 25 pound shrink would, on the basis of market values per pound, mean $2.25. Freight and expense of shipping must also be included.

All items that could enter into the production cost of the cow and the calf have been charged up to the calf, and yet each year the calf at weaning time crediting all manure, has actually shown a net profit over and above his purchasable valuation.

The average difference (for the years wherein cow and calf manure is credited at $15.00 for estimated ten tons produced) in favor of home grown over purchased calves is $5.08. If only 6 tons are credited per cow and calf instead of 10, this makes a subtraction of $6 necessary, — which would make a net loss of $0.92 per calf.

Then, too, the determination of the production cost by cash accounting methods has its limitations in that consideration is not given to the possible use of pasture land and other feeds for other purposes of a more or less profitable nature. For instance, the question arises as to the relative profitableness of corn and oats and alfalfa growing versus cattle pasturing on land that is considered good crop land. Again, the possibility of using, say one-third to one-half of this pasture land for the growing of silage for supplementing the pasture may be a potent consideration.

These problems would, of necessity, be solved by comparing the different systems on similar farms, in other words, it is an animal husbandry and farm crops problem in general farm management. But everyone can take these figures as given and manipulate and apply them so as to get the utmost from them for his own local conditions.

WEIGHTS AND COST OF BREEDING HEIFERS

The weights of the yearling heifers at 18 months of age varied from 777 pounds in 1916 to 858 pounds in 1915. In 1916 the valuation placed on them was 8½ cents per pound, giving a total valuation of $64.10. In 1915 the valuation was 8 cents per pound, giving a total valuation of $70.70. See table V.

THE MAKING OF THE BABY BEEVES

The physical equipment of the Walnut Ridge Stock Farm has permitted the feeding of more calves than could be raised at home. Usually 150 to 200 calves are purchased for feeding from the market or direct from the range each fall.

In 1913-14 the lot designated as the market lot consisted of 197 grade Hereford range calves bought on the Sioux City market the same year. Another lot of calves, which were the home-
Fig. 3. The baby beef producers and calves at pasture.
grown calves, were fed with the definite purpose of carrying them so they could be shown in the car load lots in the fall. During the season there were some changes from the market to the show lot and from the show to the market lot, such for instance as when certain individuals that were giving promise in the market lot were changed to the show lot. Of the 197 range calves put in the feed lot November 3, 1913, there were 80 heifers and 117 steers. The average weight at the time of putting into the feed lot was 359.09 pounds. It is interesting in this connection to note that the home-grown calves designated for the show lot were some 50 pounds heavier than the calves, of practically the same age, purchased from the open market.

The discussion which follows will be devoted to the 197 head of range fed calves.

The average daily feed eaten per calf for the first ten days was 4.29 pounds shelled corn, 21.5 pounds corn silage and 4 pounds alfalfa hay. After this date one-fourth pound oil meal was added to the entire ration. Naturally the feeds were gradually increased so that by the middle of December the calves were consuming nearly 5 pounds of shelled corn, .37 pounds oil meal, 4½ pounds silage and 4 pounds of alfalfa hay per head daily. During the period from April 25, 1914, to June 21, 1914, 58 days, the average daily feed of the calves was 13.97 pounds corn, 1.09 pounds oil meal, 7.88 pounds corn silage and 4 pounds alfalfa hay. The average daily feed per calf from the time they were started on feed until those that were not turned to grass were marketed on June 21, was 9.39 pounds shelled corn, .74 pounds oil meal, 7.05 pounds corn silage and 4 pounds alfalfa hay.

For the first 47 days these calves were on feed, they made an average daily gain per calf of 2.53 pounds. For the period of 231 days following starting on feed this lot of calves made an average daily gain of 2.09 pounds, the average cost of 100 pounds of gain being $7.41, with the prices of feeds which are given at the foot of table VI.

On June 21, 159 baby beeves were sold at $9.00 per cwt., selling at a net profit per head of $7.75. The remainder of the baby beeves were held in the feed lot until they were marketed in Chicago, December 12, at $10.75 per cwt. with a total net profit of $26.61 per head.

The baby beeves that had been designated as the show lot in 1913-14, even tho they were a more select group of calves than the market lot, were fed special feeds which were somewhat more costly than standard ordinary feeds for a period of 395 days until the International time of 1914, when they were sold on the market for $11.50 per cwt., outselling the market calves which were sold in December as suggested above by 75 cents per cwt. The cost of 100 pounds gain in the case of the show calves
TABLE VI. BABY BEEVES 1913-14 MARKET LOT, SHOWING AVERAGE DAILY GAIN, AVERAGE DAILY FEED PER CALF, FEED REQUIRED FOR 100 POUNDS GAIN AND COST OF 100 POUNDS GAIN

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of days on feed</td>
<td>231</td>
</tr>
<tr>
<td>Average number of calves in experiment during period</td>
<td>201</td>
</tr>
<tr>
<td>Average weight per calf</td>
<td></td>
</tr>
<tr>
<td>Initial weight</td>
<td>359 lbs</td>
</tr>
<tr>
<td>Final weight</td>
<td>845.11 lbs</td>
</tr>
<tr>
<td>Average daily gain per calf</td>
<td>2.09</td>
</tr>
<tr>
<td>Average daily feed per calf</td>
<td></td>
</tr>
<tr>
<td>Shelled corn</td>
<td>9.39</td>
</tr>
<tr>
<td>Oil meal</td>
<td>.74</td>
</tr>
<tr>
<td>Corn silage</td>
<td>7.05</td>
</tr>
<tr>
<td>Alfalfa hay</td>
<td>4.00</td>
</tr>
<tr>
<td>Feed required for 100 lbs. gain</td>
<td></td>
</tr>
<tr>
<td>Shelled corn</td>
<td>488.05 lbs</td>
</tr>
<tr>
<td>Oil meal</td>
<td>35.16</td>
</tr>
<tr>
<td>Corn silage</td>
<td>337.27</td>
</tr>
<tr>
<td>Alfalfa hay</td>
<td>191.37</td>
</tr>
<tr>
<td>Cost of 100 lbs. gain</td>
<td>$ 7.41</td>
</tr>
</tbody>
</table>

_Feed Prices._ Corn from November 3, 1913 to March 14, 1914, 57 cents per bushel; 60 cents per bushel from March 15 to April 23; 66c from April 25 to June 21. Linseed oil meal $29.00 per ton. Corn silage $4.00 per ton. Alfalfa hay $10 per ton.

Note: The cost per 100 pounds of gain will vary according to price of feeds. At the time these calves were actually fed the above prices were current. If these or similar calves were being fed today, current market prices could be applied to the figures given on the feed required for 100 pounds gain, and the actual cost of gain determined. This point will be discussed later.

was higher than the cost of 100 pounds gain in the market lot, costing on an average for the show lot for the period 396 days, $11.23 per cwt., whereas the cost of 100 pounds gain for the entire period in the market lot was only $7.41 per cwt. The net profit of the show lot therefore was only $11.21 per head.

PASTURING THE BABY BEEVES

A group of calves, 51 in number, somewhat less in weight and perhaps younger in age, were held back in the feed lots after the large group of baby beeves were shipped to market in June, for the purpose of carrying them on to December. They were fed 183 days longer. When turned to grass they weighed 778.24 pounds per head. At the time of marketing on December 12 the average weight was 1081.37 pounds. During the pasture season in the fall these baby beeves made an average daily gain of 1.67 pounds. These baby beeves sold in Chicago on December 12 for $10.75 per cwt. and made a gross profit per head of $26.61 above feed cost.

The following table VII gives detailed data regarding the baby beeves turned to pasture. It shows the average daily gain,
the average daily feed required for 100 pounds gain, cost of 100 pounds gain.

The pasture season opened in May and continued until in the fall. The above data indicate that cattle that have been on heavy feed for a period of time during the winter may be unprofitably turned on pasture. In this case the feed required for a hundred pounds gain, and the cost of gains was much greater during the pasture season than during the winter period. The average daily gain decreased when the cattle went on pasture and increased when the pasture season was over. The average daily gain by period was as follows: November 22 to May 2, 1.93

TABLE VII. CALVES OF 1914 TURNED OUT TO PASTURE

<table>
<thead>
<tr>
<th>Number days in period</th>
<th>Number calves in experiment</th>
<th>Average initial weight</th>
<th>Average final weight</th>
<th>Average daily gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>183</td>
<td>51</td>
<td>778.24 lbs.</td>
<td>1081.37</td>
<td>1.67</td>
</tr>
</tbody>
</table>

Average daily feed:
- Shelled corn: 12.23 "
- Corn silage: 5.54 "
- Alfalfa hay: 1.79 "

Feed required for 100 lbs. gain:
- Shelled corn: 732.18 lbs.
- Corn silage: 331.4 "
- Alfalfa hay: 107.37 "

Pasture: 12 acres

Cost 100 lbs. gain: $10.96

Feed prices:
- Shelled corn 66 cents per bushel.
- Corn silage $4 per ton.
- Alfalfa hay $10 per ton.
- Pasture $8.75 per acre.

TABLE VIII. CALVES OF 1914 FED OUT IN 1914-15

<table>
<thead>
<tr>
<th>Nov. 22 to May 2</th>
<th>May 3 to Sept. 26</th>
<th>Sept. 27 to Nov. 29</th>
<th>Nov. 22 to Nov. 29</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of days</td>
<td>162</td>
<td>147</td>
<td>64</td>
</tr>
<tr>
<td>Number of calves</td>
<td>57.87</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td>Ave. initial wt. per calf</td>
<td>439</td>
<td>618.65</td>
<td>867</td>
</tr>
<tr>
<td>Ave. final wt. per calf</td>
<td>752</td>
<td>867</td>
<td>985.54</td>
</tr>
<tr>
<td>Average daily gain</td>
<td>1.933</td>
<td>1.485</td>
<td>1.852</td>
</tr>
</tbody>
</table>

Feed required for 100 lbs. gain:
- Shelled corn: 655.57 951.67 877.51 765.62
- Oil meal: 28.26
- Cottonseed meal: 9.24 57.80 65.75 28.74
- Corn Silage: 332.45 37.01 215.96 206.74
- Alfalfa: 206.95 134.65 84.30 189.15
- Pasture: .248

Total Grain Required for 100 lbs. of gain: 693.07 1009.47 933.60 811.1
Cost of 100 lbs. gain: $ 9.58 $ 15.33 $ 11.60 $ 11.38
Profit per head: $10.22
pounds; May 3 to September 26, 1.48 pounds; September 27 to
November 29, 1.85 pounds. The cost of gains during the winter
period up to May 2 was $9.58, during the pasture period $15.33
and the period after $11.60. These data indicate that the feeder
of baby beeves, if they are not to be marketed until late summer
or fall, should not turn them to pasture but should keep them in
the dry lot; while the gains that are made during the period
following the pasture season may be increased, yet the cost per
100 lbs. gain during the pasture season in connection with dimin­
ished gains cannot be overcome even tho the gain during the
finishing period after pasture may be quite heavy.

FATTENING THE CALVES OF 1915

The calves of 1915 were put on feed in November, 1915, and
fed in dry lot until December 2, 1916, a period of 386 days.
The average number in the feed lot for the whole feeding
operation was 41.77.

From this number 14 head were selected to be shown at the

| TABLE IX. BABY BEEVES IN 1915-16 MARKET LOT, SHOWING AVER­ |
| AGE DAILY GAIN, AVERAGE DAILY FEED PER CALF, FEED RE­ |
| QUUIED PER 100 POUNDS GAIN AND COST OF 100 POUNDS GAIN |
| Number of days on feed | 386 |
| Average number in the lot for the entire period | 42 |
| Average initial weight | 417 lbs. |
| Average final weight | 1043 lbs. |
| Average initial value, $8.25 per cwt. | $34.40 |
| Average final value, $12.08 per cwt. | $125.99 |
| Average daily gain | 1.879 lbs. |
| Average daily feed consumed per head: |
| Shelled corn | 11.37 |
| Oats | 1.36 |
| Oil meal | 0.26 |
| Cottonseed meal | 0.76 |
| Corn silage | 6.35 |
| Alfalfa hay | 4.00 |
| Feed required per 100 lbs. gain: |
| Shelled corn | 602.71 |
| Oats | 72.08 |
| Oil meal | 13.95 |
| Cottonseed meal | 40.59 |
| Corn silage | 336.85 |
| Alfalfa hay | 211.92 |
| Cost of 100 pounds gain: |
| a—Excluding pork and manure | $11.29 |
| b—Crediting pork and manure | $8.61 |
| Actual selling price at home after all expenses connected with ship­ |
| ping were deducted | $12.08 |
| Profit per head, crediting pork and manure | $17.01 |
| Feed prices: Corn 64 1/2 cents per bushel. |
| Oats 35 cents per bushel. |
| Oil meal $44.00 per ton. |
| Cottonseed meal $30.75 per ton. |
| Corn silage $4.00 per ton. |
| Alfalfa hay $10.00 per ton. |
Inter State Fair at Sioux City, Iowa, on September 14. The 14 head taken out for the Sioux City Fair weighed 1022 pounds on September 14, making them approximately 17 months of age. While the group of calves that remained in the feed lot were fed for a period of 386 days, a feeding period somewhat longer than is necessary and particularly under present conditions, they were in high condition and sold at the top of the Chicago market on that date at $12.50 per cwt.

Table IX gives details regarding the feeding of the group of calves or of the baby beeves for 1915-1916. Calves put on feed November 17, 1915, and sold as baby beeves December 10, 1916.

Table X. Net cost of calf at weaning, difference between net cost and value at weaning, cost of feed and total cost when ready for market in 1917-1918.

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cost of cow keeping</td>
<td>$53.01</td>
</tr>
<tr>
<td>Value of 10 tons manure produced by cow @ $1.50 per ton</td>
<td>$15.00</td>
</tr>
<tr>
<td>Net cost of calf at weaning time</td>
<td>$38.01*</td>
</tr>
<tr>
<td>Value of calf 412 lbs. @ $12.00 per cwt</td>
<td>$49.84</td>
</tr>
<tr>
<td>Net cost of calf at weaning time</td>
<td>$38.01*</td>
</tr>
<tr>
<td>Difference between net cost and value at weaning time</td>
<td>$11.83</td>
</tr>
<tr>
<td>Selling price 1160 lbs. @ $17.60 per cwt</td>
<td>$204.16</td>
</tr>
<tr>
<td>Credit—pork and manure</td>
<td>$17.00</td>
</tr>
<tr>
<td>Total credit</td>
<td>$232.99</td>
</tr>
<tr>
<td>Net cost at start of feeding period</td>
<td>$38.01</td>
</tr>
<tr>
<td>Cost of feed and labor and overhead charges</td>
<td>$175.70</td>
</tr>
<tr>
<td>Total cost</td>
<td>$213.71</td>
</tr>
<tr>
<td>Profit per baby beef</td>
<td>$19.28</td>
</tr>
<tr>
<td>Prices of feeds: Corn $1.60 per bushel.</td>
<td></td>
</tr>
<tr>
<td>Oats 75 cents per bushel</td>
<td></td>
</tr>
<tr>
<td>Oil meal $60 per ton</td>
<td></td>
</tr>
<tr>
<td>Cottonseed meal $55 per ton</td>
<td></td>
</tr>
<tr>
<td>Corn silage $10 per ton</td>
<td></td>
</tr>
<tr>
<td>Alfalfa hay $15 per ton</td>
<td></td>
</tr>
</tbody>
</table>

It will be noted that the price of $17.60 per cwt. is used as the selling price. This is based on figuring cost of marketing excluding shrink. The baby beeves were sold last fall for this price and on the assumption that market prices will be maintained, the above results would be obtained. The weight of 1160 pounds used is average Chicago weight last fall—in other words this is home weight minus shrinkage in transit.

A net profit of $19.28 is a good showing; it must be carefully kept in mind that $11.83 of this amount was the profit on the calf at weaning time and only $7.45 of the total profit made on the feeding operation.

* This estimated cost is higher than for the three years because silage and hay particularly increased in selling value. Manure (10 tons) is credited to cow and calf. If 6 tons is credited calf cost should be $44.10.
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