Management Systems for 25-50 Cow Herds
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Harlan D. Ritchie, and Gerald Schwab Department of Animal Science
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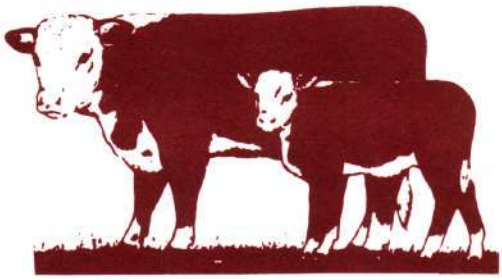

MICHIGAN BEEF PRODUCTION

COOPERATIVE EXTENSION SERVICE • MICHIGAN STATE UNIVERSITY

Management Systems for 25- to 50-Cow Beef Herds

By Harlan Ritchie, Animal Science Department and Gerald Schwab, Agricultural Economics Department

A herd of 25 to 50 commercial beef cows does not generate sufficient dollars to be considered a full-time enterprise. However, when properly managed, it can be a source of supplemental income, especially if the land involved would otherwise lie idle. The four important factors that determine profit in any beef cow herd are: (1) percent calf crop weaned or marketed; (2) cost of maintaining the herd; (3) weaning weight or sale weight of the calves; and (4) price per pound received for the calf crop. Failure in any one of these four areas can mean the difference between profit and loss.

Resource Considerations

General Considerations

Resources limiting the size of a beef cow herd to no more than 50 females would likely be a lack of labor, land or capital. If the limiting resource is labor, there is usually more land available than can be fully utilized and the system of production tends to be extensive. If land is the limiting resource, the management system is more apt to be intensive. If capital is limiting, the system may be either extensive or intensive, but more apt to be the former.

Specific Resource Requirements

Before engaging in any enterprise, consider your available resources, i.e. your land, labor, capital and management capabilities. A beef cow herd tends to fit on land that is not capable of growing high-valued cash crops. The labor requirement per cow may be substantial but tends to be flexible as to the timing of when things have to be done. Facilities and capital items required are quite flexible and vary by geographic area and by individual operator. The amount of cash required per year for non-feed items varies between $60 and $90 per cow. Remember that the cash inflow or capital turnover is slow with a beef cow enterprise. There may be only one payday each year.

Some estimates of the resources required for a 50-cow herd are presented in the following paragraphs.

Land Required for Pasture and Hay

1. *Land required for pasture:*
   a. Minimum of 1 acre per cow or a total of 50 acres on fertile, highly-productive land.
   b. Maximum of 10 acres per cow or a total of 500 acres on heavily wooded and/or infertile, unproductive land.
   c. Average of 3 to 4 acres per cow or 150 to 200 acres on marginally productive permanent pasture land not suitable for cash crops.
2. *Land required for hay:*
   a. Depending upon the length and severity of the winter feeding period, hay requirements vary from 2.0 to 3.5 tons per cow unit (including the hay requried for replacement heifers and herd sires). Average for the central U.S. would be about 2.5 tons per cow unit.
   b. Hay yields tend to vary from 1 to 5 tons per acre, with an average of about 2.5 tons.
   c. Land required for hay production would, therefore, vary from a low of 0.4 acres to a high of 3.5 acres per cow unit. Average would be about 1 acre of hay land per cow unit.
   d. Total land for hay production for a 50-cow herd would vary from 20 to 175 acres, with an average of about 50 acres.
3. *Total land requirements:*
   a. Minimum of 1.4 acres per cow unit or 70 acres for a 50-cow herd on the most fertile land.
   b. Maximum of 13.5 acres per cow unit or 675 acres for a 50-cow herd on heavily wooded and/or infertile, unproductive land.
   c. Average of 4 to 5 acres per cow unit or 200 or

250 acres for a 50-cow herd on marginally productive land.

4. In the eastern ⅔ of the United States, investment in land per cow unit currently ranges from $1,500 to $2,500 per cow unit, with an average of about $2,000.

Investment in Cattle

50 females @ $400 to $700 per cow	$20,000 to $35,000
Two bulls @ $1,000 to $2,000	$2,000 to $4,000
Total	$22,000 to $39,000

If artificial insemination were used during the early part of the breeding season, one bull would be adequate.

Investment in Buildings, Equipment and Machinery for 25-50 Cow Beef Herd

All-purpose building for calving, hay and grain storage	$10,000 to $25,000
Corral or handling facility with headgate	$1,000 to $3,000
Fencing	$2,500 to $5,000
Automatic watering system	$500 to $1,000
Feeding bunks and racks	$250 to $1,000
Self-feeders for minerals	$200 to $400
Small equipment (syringes, needles, halters, etc.)	$100 to $200
Sprayer for weed control	$300 to $800
Used tractor with front-end loader	$2,500 to $5,000
Used 3-bottom plow	$300 to $400
Used hay wagon	$500 to $1,000
Used 10-foot disc harrow	$500 to $1,000
Used manure spreader	$500 to $2,000
Used 10-foot spring tooth harrow	$250 to $500
Used mower-conditioner	$2,000 to $3,000
Used drill	$500 to $750
Used hay racks	$200 to $500
Used hay baler	$1,000 to $2,500
Total	$23,100 to $53,050

For a beef cow herd to be profitable, the above investments must be held to a minimum. They could be further reduced by the following set of conditions:

1. Use of old existing buildings or woods for shelter.
2. Use of old existing buildings for feed storage.
3. Storage of hay outside in form of large stacks or bales.
4. Custom hiring of tillage, seeding, hay harvesting and other machine work.
5. Use of farm ponds for water.
6. Feeding hay on frozen ground instead of in stacks or bunks.
7. Use of electric fencing as much as possible.

If the above conditions existed, investment in buildings, equipment and machinery could possibly be reduced to $3,000-$5,000.

Labor Requirements

The labor required for animal management ranges from 7 to 35 hours per cow unit per year, with an average of about 20 hours. This does not include the labor required to produce feed for the cow herd, which will probably average 5 to 10 hours annually per cow unit. Maintenance of machinery, buildings, facilities and fencing will add another 2 to 5 hours per cow unit per year to the labor requirement. Total labor in a 50-cow herd will average close to 30 hours per cow unit or 1,500 hours total.

A small herd of 25 to 50 cows is a supplementary enterprise which utilizes family labor that might not otherwise be used. Normally, little outside labor is hired except for harvesting of forage.

Annual Production Costs

Listed below are annual costs for maintaining an average 50-cow beef herd. These figures are based on recent USDA surveys as well as estimates from individual states in the eastern ⅔ of the United States.

Annual Cow Costs (1981)

Item	Cost per Cow Unit
Winter roughage	$110
Pasture	45
Salt & mineral	5
Grain + supplement	15
TOTAL FEED COSTS	$175
Veterinary & drugs	7
Machinery & fuel expenses	15
Breeding costs	11
Hired labor	6
Utilities	3
Marketing & transportation	6
Repairs & maintenance	15
Supplies	4
Interest	93
Depreciation, taxes & insurance	25
TOTAL NON-FEED COSTS	$185
TOTAL ALL COSTS	$360

Forage Management Systems

The cost of supplying forages represents about one-half of the total cost of maintaining a beef cow unit. Efficient management of pastures and winter feed sources can determine success of the beef cow enterprise. Both the yield and quality of the forage are crucial. Several techniques are available to increase forage production. In evaluating a new forage production practice, consider not only the cost, but the risk of price and yield changes associated with each particular practice.

Several techniques can be used to improve the quantity and quality of forage from your pasture program. You may choose to improve the production of seeded pasture or to renovate the pasture completely. Your decision should be influenced by expected pasture yield, the pasture composition of desired grass-legume mix-

tures and undesired weeds and brush, and the cost of the various improvement-renovation practices.

Pasture Improvement

On old or presently seeded pasture, possible pasture improvement techniques are:

1. *Fertilization.* Grass pastures respond to nitrogen fertilization and/or high nitrogen fertilizer in relation to phosphorus and potassium content; e.g. an N-P-K mix of 2-1-1 or 4-1-2. Legume pastures require potassium fertilization.

To assure high utilization of fertilizers, the pH or soil acidity measure should be no less than 6.0 and preferably closer to 7.0. Soil testing is a relativley inexpensive method to obtain information on your soil quality, and application of lime can correct the acidity problem.

Fertilizer may be topdressed in winter or early spring. Apply fertilizer at a time when the field remains structurally solid but you can still minimize the risk of surface runoff and loss of fertilizer. Heavily utilized pastures can benefit from fertilizer directly after being harvested when in a resting-rebuilding stage of development.

2. *Weed control.* Mowing or clipping pastures at about 3 in. height is one method of controlling weeds but may not be as effective as spraying with herbicides.

Good weed control will reduce competition against your desired forage species for needed plant nutrients, moisture, and space. Clipping pasture in late summer-early fall before the weeds can reseed can be an especially effective time for weed control. Forage production will improve and pasture carrying capacity will increase.

Spraying may provide more effective weed control but necessitates investment in a sprayer and herbicides, some of which are relatively expensive. Nevertheless, a combination of clipping and spraying is generally a profitable procedure for pasture improvement.

3. *Drainage.* Some forages, especially alfalfa, cannot tolerate "wet feet." Tile drainage may be the only effective way to rid your pasture of excess water and improve forage production potential. However, tilling is a high investment practice; make certain the increase in forage production justifies the expense. It is usually most feasible on highly fertile alfalfa-producing land.

4. *Grazing management.* Avoid overgrazing. The various forages have seasonal growth patterns unique to each species. Most species do not tolerate hard continuous grazing in which the plants are clipped close to the ground. Research suggests that forage yields tend to be lower with continuous harvest as opposed to periodic harvest. This suggests that rotation grazing, whereby your pasture may be subdivided into grazing plots sufficient for 20-30 days continuous grazing, then rested for 30-40 days, may increase your forage production potential.

Pasture Renovation

Complete renovation of pasture may require more dollars than improvement of old pasture but also may provide a higher payoff in terms of increased forage and beef production.

There are several items of importance in renovation:

1. *Fertilization and liming.* Phosphorus is especially important in establishing a new seeding. Soil test will suggest recommended levels of fertilizer and lime. The fertilizer may be applied at seeding time but lime should be applied in the previous fall or spring.

2. *Seedbed preparation.* A seedbed is desired in which the old sod is killed and good soil-seed contact is provided for new seed. The amount of tillage recommended will depend upon the steepness and rockiness of your land. Seeding establishment using herbicides in lieu of physical tillage practices can be an alternative on steep, rocky fields so as to minimize risk of soil erosion.

3. *Timing and method of seeding.* This will vary by area of the country. Traditionally, new seedings have been band seeded with a drill in the spring using a companion grain crop such as oats. The companion crop does compete with the forage seedling for light and plant nutrients but may provide a harvestable crop which reduces the cost of establishment. Seeding in the spring without a companion crop requires use of herbicides for weed control. This method may require more cash outlay but usually results in better establishment of the forage seeding. Summer and fall seedings may be established without herbicides if proper tillage techniques are used to control weed growth.

4. *Forage species selection.* Much consideration should be given to planning your grazing management program as related to seasonal growth of the various forage species and seasonal demand for forage by your beef cow herd. Cool-season grasses produce relatively more during spring and early summer, whereas warm-season grasses start growth later in the season but produce relatively more growth during summer. Most grasses commonly used in pasture mixes tend to be cool-season grasses; e.g., bromegrass, timothy, orchardgrass, fescue and reed canarygrass. Legumes commonly used are alfalfa, birdsfoot trefoil, red clover, white clover, ladino, alsike, etc. To enable better management of pasture mixes, it is suggested that the mixture in one seeding be composed of no more than two or three separate species.

5. *Grazing Management.* In the seeding year, the new crop should not be put under stress. However, a harvest which is completed about 4-6 weeks before the first killing frost may be beneficial. In subsequent years, some system of rotational grazing should be developed.

For additional details on pasture improvement and management, see fact sheets 2000, 2001, and 2002.

Providing Forage for Winter Feeding

1. *Hay Feeding Systems.* As mentioned before, winter hay requirements range from 1.5 to 3.5 tons per cow unit. The required amount will vary with the length and severity of winter, forage quality, use of crop residues, winter grazing, size of cow, when the cow calves, and her level of milk production. Winter hay requirements for a 50-cow beef herd are presented below. Hay alone is not adequate for all classes of beef cattle. Youngstock, herd sires, and in some cases, lactating cows, require supplemental grain in addition to hay. If the hay is low in quality, it may be necessary to add a protein supplement.

50-Cow Herd Winter Feed Budget Using Hay as Roughage[1]

Item	No.	Hay (T.)	Grain (T.)	Salt-Min. lb.
Preg. & lactating cows	40	102.0	---	1080
Preg. & lactating heifers	10	25.5	---	270
Open yrlg. heifers	13	14.0	5.85	351
Mature herd sire	1	2.7	0.90	27
Young herd sire	1	1.8	1.08	27
Total, T or lb.	---	146.0	7.83	1755

[1] *180-day winter feeding period*

Although performance of the beef cow is less sensitive than the dairy cow to feed quality, a high quality feed should nevertheless be your goal. Moreover, harvesting high quality hay dictates the need to cut the forage at late bud stage for legumes and early bloom for grasses. Harvesting hay early increases the total energy and protein yield provided by each acre.

2. *Corn Silage Feeding Systems.* For producers who grow corn, the following is a winter feed budget based on corn silage as the only forage.

50-Cow Herd Winter Feed Budget Based on Corn Silage[1]

Item	No.	Corn Silage (T.)	Soy (T.)	Salt-Min. (lb.)
Pregnant & lactating cows	40	192.0	2.40	1080
Pregnant & lactating heifers	10	51.0	1.08	270
Open yrlg. heifers	13	50.5	1.17	351
Mature herd sire	1	7.2	0.11	27
Young herd sire	1	7.2	0.11	27
Total, T. or lb.	—	307.9	4.87	1755

[1] *180-day winter feeding period.*

3. *Crop Residues.* Since winter feeding is the most expensive period for the beef cow, steps should be taken to minimize this cost without adversely affecting beef cow performance. If you calve in the spring, use crop residue and aftermath during the cow's dry period to decrease the need for harvested hay. Possible residue sources are corn stalk fields, bean stubble, and regrowth since the last cutting of hay. For example, grazing one acre of corn stalks can provide from 30 to 60 days maintenance ration for one dry beef cow. After the first 30 days of grazing, it may be necessary to supplement the stalks with some hay or other harvested feed. Stalks are deficient in calcium, phosphorus, vitamin A and protein, so provisions should be made to supplement these nutrients, especially after the first 30 days. Grazing crop residues provides a relatively inexpensive energy source, requires less labor than feeding from storage, and is an easy manure distribution technique. One invisible cost associated with this technique is the possible detrimental effect on next year's crop yield from those fields which are grazed and trampled by the cows. Detailed information on crop residues is presented in Extension Bulletin E-1585.

Animal Breeding Systems

Straightbreeding

Staying with one breed of cattle is obviously the easiest breeding system of all because you have to purchase only one breed of bull and it requires a minimum of breeding pastures and lots. However, it makes no use of crossbred hybrid vigor, which can result in as much as a 20% increase in pounds of calf raised per cow in a well-managed 3-breed cross. Nevertheless, straightbreeding is often the system of choice for many producers with less than 50 cows whose labor and capital are limited. Using good sires and good management in a straightbreeding program will result in greater productivity than using mediocre sires in a poorly managed crossbreeding program.

Crossbreeding

1. *Two-breed crisscross.* In this system, daughters of one breed of sire are mated to another breed of sire and vice versa. Maternal hybrid vigor will eventually stabilize at 67% of the maximum which is present in an F_1 (first cross) female. Common examples of the two-breed crisscross are Hereford x Angus, Hereford x Shorthorn, and Charolais x Angus. This system may be feasible for a 25 to 50-cow herd owner, but it is somewhat more complicated than straightbreeding and means that two breeds of bulls must be purchased and maintained.

2. *Three-breed rotational cross.* This is similar to the two-breed crisscross except that three breeds are used instead of two. Maternal hybrid vigor stabilizes at 87% of the maximum, which is 20% higher than in the two-breed crisscross. This system is generally considered too complicated for small herds of less than 50 cows.

3. *Two or three-breed cross in which breeds are changed every 3-4 years.* This is a much simpler system than the 2- and 3-breed crosses discussed above. It makes a good program for the small herd owner who wants to crossbreed. In this system, one breed of bull is used in the herd for 3-4 years, a second breed is used for 3-4 years, and then to a third breed or back to the first breed, etc. For that matter, a new breed can be used every 3-4 years until you run out of breeds. Hybrid vigor stabilizes at about 50 to 60% of the maximum possible.

4. *Terminal sire breed mated to F_1 females.* In this system, a growthy, muscular terminal sire breed is mated to maternal F_1 females and the entire calf crop is sold. No heifers are retained in the herd because all replacements are purchased, which is the primary disadvantage of the system. Maternal hybrid vigor reaches the maximum of 100%. This is an excellent crossbreeding system for the small producer if he is able to purchase F_1 feamles; unfortunately, this may not be the case.

5. *Using crossbred bulls.* Because purebred bulls in most of the new exotic breeds have been too scarce and expensive for commercial herd owners to buy, they have resorted to using ½, ¾ and 7/8-blood percentage bulls, Progeny sired by these crossbred bulls tend to segregate and lack some uniformity. But if the bull himself is an outstanding individual and is out of superior parentage, he can usually do a good job of siring the right kind of calves. Using ½-blood exotic cross bulls on straightbred British cows also provides a means of producing 3-way cross calves without keeping large ½-blood exotic cross cows that would require more feed for maintenance.

6. *Which breeds to use in a cross?* Consult Fact Sheet No. 5500 for a detailed discussion of the characteristics of the various breeds. In a small herd with limited resources, it may be advisable to concentrate on the British breeds because the larger, heavier-milking breeds require more intensive management. However, if feed and labor are plentiful, larger, milkier breeds might be a better choice.

Artificial Insemination

In an extensively-managed herd of less than 50 cows, artificial insemination may prove to be difficult because the herd owner is often employed away from the farm. This means that he will not be able to adequately detect heat unless other members of the family are available for this chore. This is unfortunate because A.I. enables a small herd owner to use bulls that are far superior to any that he could afford to purchase. Another advantage of A.I. is the fact that it makes crossbreeding more feasible for small herds. Consult Extension Bulletins E-1635 and E-1636 for more information on A.I.

Heat Synchronization

Synchronizing heat with compounds such as prostaglandin would help make artificial insemination more practical because a sizeable portion of the herd could be bred at pre-determined times. It would also aid in bunching the calf crop and possibly reduce the length of the calving season. It is important to remember, however, that heat synchronizing drugs will have no effect on cows that are in poor condition and not cycling properly.

Importance of Sire Selection

Sire selection is extremely important in any herd of cattle. If replacements are produced within the herd, the sires used in that herd account for 85 to 90% of the genetic improvement that occurs over a 15 to 20-year period of time.

It is not uncommon for two bulls within the same breed to sire calves that differ by as much as 30 lbs. per calf at weaning time. At 70 cents per pound, this is a difference in value of $21 per calf. If the two bulls each sire 75 feeder calves over a 4-year period, the calves from the superior bull are worth a total of $1,575 more than those sired by the inferior bull. This does not include the added value of his daughters that go into the herd as replacements.

According to a recent survey, commercial producers pay from $400 to $3,000 for their herd sires. The latter figure is likely higher than a small herd can justify, but the former is too low to ensure that the bull will work any herd improvement. Perhaps a realistic price range for most small herds would be $1,000 to $1,500.

Try to find bulls that weigh 500 lb. or more at weaning and 900 lb. or more at a year of age, with herd ratios of at least 105 at these ages. The ratios aid in comparing bulls in different herds that vary greatly in their feeding and management levels,

A small commercial herd owner should not attempt to produce his sires in his own herd. With only 10 to 20 bull calves born in the herd each year, it is unlikely that he can produce a herd sire superior to those available in the better seedstock herds.

Number of Cows Per Bull

Twenty-five cows can be serviced by a bull that is 2 years of age or older. A yearling bull should not be mated to more than 10 to 20 females. A 50-cow herd will generally require two herd sires. If the bull gets too thin during breeding season, feed him some grain once a day.

When to Breed

In the northern states, calves born from January 1 to April 30 are usually preferred to those born later in the year. In the Southern states where more winter grazing

is practiced, there are large numbers of calves born in the fall of the year. In general, calving should be timed so that the calves are dropped approximately 60 days prior to the time the herd goes to pasture. In this system, the cows go to grass when they reach their lactation peak and the calves are large enough to handle the extra milk without scouring. Maximum use is thereby made of the young, rapidly-growing forage. An extra heavy stocking rate must often be used to stay ahead of the new grass unless some of it is harvested as first-cutting hay.

Virgin heifers of the British breeds should weigh at least 600 lbs. when they are bred at 14 to 15 months of age. Heifers of the larger breeds should weigh at least 700 lbs. at breeding time. If your heifers do not weigh this much, breeding should be delayed until they do; however, this puts them out of sequence with the remainder of the herd. In this case, it may be preferable to hold them over to calve at 3 years instead of 2 years of age. Yearling heifers should be mated to an easy calving bull. It is generally recommended that heifers be exposed to a bull one heat period earlier than the cow herd. The rationale for this practice is the fact that heifers usually take this much longer to re-breed after having their first calf. However, this is not necessarily true if they are well grown out, separated from the older cows, and fed liberally after calving.

In order to avoid a strung-out calf crop, the bull should be pulled from the cow herd no later than 90 days from the time he was turned in. A 45-day season would be ideal but is extremely difficult to attain; a 60-day season is more realistic and a 90-day season is most apt to be the norm. To illustrate, an April 1 to June 30 breeding season would be practical in many areas and in many herds. Based on a 283-day pregnancy period, the cows would calve from January 10 to April 10. If the average birth date of the calves were February 23, their average age during October feeder cattle sale time would be about 8 months, which is an ideal marketing age. In the Southern states, a typical breeding season would range from February 20 to May 20, so as to calve from December 1 to Feb. 28. In the Northwest states, a more typical breeding season would range from may 7 to August 4, so as to calve from February 15 to May 15.

Getting the cow herd bred early in the breeding season is extremely important if they are to calve every 365 days. If average length of gestation is 283 days, it means that you have only 82 days in which to get a cow re-bred. If it takes her 45 to 60 days to recover from calving, you really only have 22 to 37 days, which is 1 to 1.75 heat-cycles (21 days per cycle). Even if she were ready to breed at 30 days past-partum, as a few cows are, you still have only 52 days or 2.5 heat cycles. Any significant reproductive problem in the herd will result in a later calf crop the following year. In order to maximize pounds of weaned calf in the fall, it is usually necessary to calve in the winter or early spring, as noted above. However, early calves born during extremely cold weather require more time and labor. If you cannot invest the time needed to ensure a high percentage calf crop at that time of year, you may have to calve your herd on pasture in late spring or early summer and be content to sell fewer pounds of calf in the fall. Each herd owner must make this decision for himself.

What If Cows Don't Breed?

Even if time and labor are limited, someone should check the herd at least once a day during the breeding season. In addition to breeding activity in the cow herd, the calves should be checked for scours, pneumonia, pink eye, lameness, etc.

If you do not see any cows in heat or if a high percent of them return to heat after 21 days, the problem could be one or more of the following: 1) cows may be too thin and need more energy; 2) bull may either be subfertile or not working; 3) deficiency of phosphorus, iodine, cobalt or vitamin A; 4) reproductive problem such as cystic ovaries, uterine infection, IBR, leptospirosis or vibriosis; 5) it may be too soon after calving (most cows are not ready to breed until 45 days postpartum).

Wintering the Herd

Supplying winter feed accounts for about ⅓ of all costs involved in maintaining a beef cow herd. Overfeeding is an extravagance one cannot afford, but under-feeding will cost dollars in the form of lower conception rates, lower milk production, lighter weaning weights, and less salvage weight to sell in the form of cull cows.

Divide the Herd into Nutritional Groups

Ideally, the herd should be broken into the following nutritional management groups for winter feeding: 1) mature cows in good condition; 2) pregnant yearling heifers, thin 2-yr.-olds that have just weaned their first calf, and old thin cows; 3) weaned heifer calves; and 4) herd sires. Small herd owners may not have enough lots or fields to divide the herd into this many groups. If not, groups 2 and 3 could be put together or groups 1 and 2 could be combined. If necessary, mature herd bulls can winter with the cows, but yearling and 2-yr.-old bulls should be separated so they can be fed some grain. Small herds can get by with running different ages and classes of cattle together much better than larger herds. When too much mixing occurs, larger, stronger cattle eat more than their share and smaller, weaker individuals get pushed away and fail to eat enough to meet their nutritional requirements. If plenty of feeding space is provided, this problem can be minimized. A lack of watering sites often limits the number of wintering groups that small herd owners can run. If this is the case, investment in more water fountains will usually pay dividends.

Daily Rations for Wintering the Herd

1. Rations based on hay:
   a. Dry mature cows: 20-30 lb. hay.
   b. Lactating cows: 30-40 lb. hay (full-feed) + grain if necessary.
   c. 2-yr.-old pregnant heifers: 25-30 lb. hay (full-feed).
   d. Weaned heifer calves: 12 lb. hay (full-feed) + 6 lb. grain.
   e. Yearling and 2-yr-old bulls: 20 lb. hay (full-feed) + 12 lb. grain.
   f. Mature bulls: 30 lb. hay (full-feed) + grain to condition.

2. Rations based on corn silage (30% dry matter):
   a. Dry mature cows: 40-50 lb. corn silage.
   b. Lactating cows: 60-75 lb. corn silage + 1½-2½ lb. soy equivalent.
   c. 2-yr.-old pregnant heifers: 40-50 lb. corn silage + 1 lb. soy equivalent.
   d. Weaned heifer calves: 40 lb. corn silage + 1¼ lb. soy equivalent.
   e. Yearling and 2-yr.-old bulls: 80 lb. corn silage + 1¼ lb. soy equivalent.
   f. Mature bulls: 80 lb. corn silage + 1¼ lb. soy equivalent.

3. Regardless of the feeding program, salt and mineral should be offered free-choice. Daily consumption will normally range from 0.1 to 0.2 lb. per head per day, with an average of about 0.15 lb. The following mixes are recommended:
   a. 2 parts trace mineral salt and 1 part calcium-phosphorus source.
   b. 1 part trace mineral salt and 1 part calcium-phosphorus source.
   c. 1 part trace mineral salt and 2 parts calcium-phosphorus source.

Record Systems

A farmer must keep records on his total farm business in order to prepare an accurate income tax return. At a bare minimum, the farmer should know his annual farm income, expenses and depreciation on purchased livestock, machinery, buildings and equipment, and any sales of the capital asset items.

However, to provide more knowledge and enable better managerial analysis, the need for beef enterprise records is strongly recommended. The profits from a beef cow herd are heavily influenced by percent calf crop, average weight of the calves, feed costs, and non-feed costs. If you do not know these factors, it is difficult, if not impossible, to identify any existing weakness of your beef cow enterprise and make changes to improve performance.

Enterprise records would require the recording of all cash income and expenses associated with the beef cow enterprise. Depreciation records would be kept on all purchased livestock, and any buildings, equipment and machinery used strictly by the beef cow enterprise. Cash expense for the beef cow herd should be identified as feed or non-feed with each category subdivided into specific items which recur through the years; e.g. grain, forage, purchased protein, mineral, medicine and veterinarian service, utilities, etc. With these types of records, you can determine exactly the costs associated with the beef cow operation.

Performance records would provide even more information in identifying strengths and weakness of your herd as well as the productivity of individual cows within the herd. To make possible the keeping of performance records, it is necessary that each animal be permanently identified. Possible identification methods include ear tags, hot brands, freeze brands, tattoos, neck chains, or some combination of these methods.

The amount of detailed records kept will vary with each individual herd owner. Some basic information that might be kept on each cow is as follows:

1. Identification number of cow.
2. Age (birth date) of cow.
3. Dates of breeding and conception date.
4. Identification of cow's sire.
5. Birth date of calf.
6. Sex of calf.
7. Age and weight of calf at weaning.
8. Health records: sickness, treatment, vaccinations and testing.
9. Post-weaning performance of calves kept for replacements.

With the aid of these records, high performing females can be identified and retained in the herd, and low-performing as well as late-calving cows can be culled. Only with records of this type, can you conscientiously do a good job of selecting and improving breeding stock and providing accurate knowledge of how to improve other practices such as feeding, herd health, etc. in your beef cow operation.

Herd Health Systems

Possible Procedures for Newborn Calves

1. Dip navel in 7% iodine to prevent navel ill.
2. Ear tag for identification purposes.
3. Make sure calf nurses a fill of colostrum in the first 1 to 4 hours of life.
4. Inject 2-4 cc Bo-Se (selenium & vitamin E) if white muscle disease is a problem in your area.
5. Inject 2 cc vitamins A & D (optional).
6. Castrate (optional).
7. Dehorn with caustic paste (optional).
8. Vaccinate calf with intra-nasal IBR and PI_3 vaccine if it is a problem and your cow herd has not yet been vaccinated.
9. Vaccinate calf for Rota and Corona virus scours if

these are a problem in your herd.

Pre- and Post- Weaning Vaccinations

1. Brucellosis: vaccinate heifer calves between 2 and 7 mos. of age.
2. Blackleg and Malignant Edema:
   a. Vaccinate at 3 to 4 months of age.
   b. If a serious problem in area, vaccinate at 1 month of age and repeat at 6 months.
3. Leptospirosis: vaccinate at 3 to 4 months of age if it is a problem in the area.
4. IBR, BVD, and PI_3:
   a. Vaccinate calves 4 weeks prior to weaning.
   b. Re-vaccinate replacement heifers between 9 and 12 months of age.
   c. If cow herd is not immune, vaccinate calves at 1 to 3 months of age with intra-nasal vaccine and re-vaccinate at 9-12 months.

Cow Herd Procedures

1. Fertility examination for any cows that had extreme difficulty at calving. This should be done 30-45 days after calving. Any abnormalities should be diagnosed and treated.
2. Pregnancy test 35-40 days after breeding season.
3. Leptospirosis: annual vaccination if it is a problem in the area.
4. Vibriosis: annual vaccination if it is a problem in the area. Two injections the first year at 10 to 14-day intervals.
5. E. coli scours vaccination of cows prior to calving.

Care of the Bull

1. Make sure bull is fed and managed so as to go into breeding season in top physical condition.
2. If there is any doubt about his ability to breed cows, have your veterinarian examine the bull about 60 days prior to breeding season.
3. If leptospirosis or vibriosis are problems, vaccinate the bull annually.

Parasite Control

1. *Internal parasites:*
   a. If calves appear unthrifty in summertime, have veterinarian check manure samples for worm eggs. Worm if necessary.
   b. Consider worming routinely at weaning time.
   c. Products ordinarily used are levamisole ("Tramisol"), Thibenzole ("TBZ"), haloxon ("Loxon"), and phenothiazine.
   d. Coccidiosis requires use of amprolium or decoquinate.
2. *External parasites:*
   a. Summer fly control will improve calf gains and help prevent pink eye. Insecticide ear tags, spraying, dust bags, and back rubbers are common methods of control.
   b. Grubs and lice can best be controlled by applying a systemic pour-on to the backs of the cattle during the fall of the year. Cut-off dates for each product should be observed. Products in common use are famphur ("Warbex"), coumaphos ("Co-Ral"), fenthion ("Tiguvon" and "Spotton"), trichlorfon ("Neguvon"), and imidan ("Prolate").

Additions to the Herd

1. If new cattle are brought into the herd, make sure they have been tested properly for TB and Bangs. Consult your veterinarian for exact requirements.
2. Try to determine what diseases the new cattle may or may not be immune to. Vaccinate accordingly.
3. New additions to the herd should be isolated for a period of time before being mingled with the main herd.

Stressed and Scouring Calves

1. Treatment with anti-bacterial drugs should be carried on for a minimum of 3 days.
2. If a combination of drugs is used, make certain that they are compatible. Consult veterinarian.
3. Dehydrated calves must be given fluid therapy.

Calving Season Management

1. Beware of calving difficulty, especially in first-calf heifers. An incidence of 30 to 50% assistance rate in heifers is not uncommon.
2. If a cow has labored for 2 hours with no detectable progress, she should be entered and checked for an abnormal presentation. If it appears to be a serious problem, it may require a veterinarian assistance.
3. Process newborn calves according to suggested procedures noted earlier.

Marketing Systems

Depending upon your particular area, type of herd, your feed situation, etc., there are several options for marketing the calf crop. Some of these alternatives are as follows:

1. Special feeder cattle auctions.
2. Local sale yards, where weekly auctions are held.
3. Sell directly to local cattle feeders.
4. Sell to cattle dealers.
5. Sell the top steer calves to 4-H club and FFA members as show prospects.
6. Feed out your own calves, either at home or in someone else's feedlot.

There are several variations to the above alternatives.

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