



the
FARM
BEEF
HERD



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(Cover) A farm herd of Herefords.
(Courtesy of American Hereford Association)

Prepared by

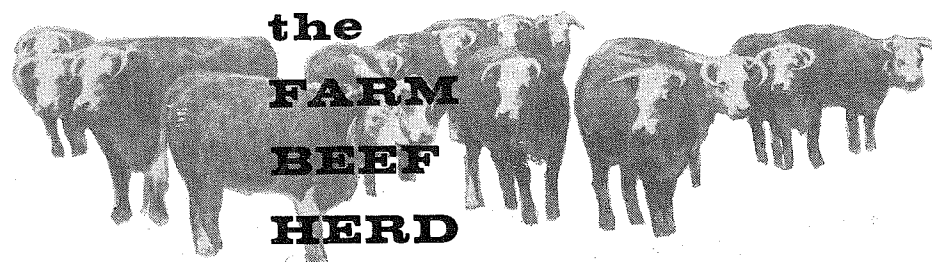
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The great western range areas traditionally are thought of as the home of our beef breeding herds. To a large extent this is true; it is probable that these areas always will be important in the Nation's beef economy. For many years, though, these western ranges have been stocked at or near capacity. In many cases, they have been overstocked. Unless new ways to increase the carrying capacities of these vast, semiarid ranges are found, cattle numbers there are not likely to increase greatly in the future.

The Nation's growing population creates an increasing demand for beef. This increase in demand probably will be met by the farm beef herd—that is, beef production in the farming areas of the Nation.

In past years most cattle grew on range or pasture until they were 2 years old or older and were sold fat off grass or fed out to heavy weights in feedlots. Today's demand is for lighter and younger beef cattle weighing about 1,000 pounds alive. Your farm beef herd must meet that demand. It also must be tailored to your farm and to the feeds you produce.

SYSTEMS OF FARM BEEF PRODUCTION

You can convert feeds produced on your farm into beef under a number of systems:

1. Beef breeding herd, with all calves except necessary replacements sold as feeders at weaning or at yearling ages. A variation of this system, more important in the South than elsewhere, is to sell fat calves for slaughter at weaning.

2. Beef breeding herd combined with feeding operation. All surplus young cattle fattened on the farm where produced.

3. Feedlot operations with purchased feeder cattle.

4. Combination grazing and feeding operations with purchased feeder cattle.

5. Dual-purpose breeding herd, with calves either fattened on farm where produced or sold to feeders.

The particular system of beef production that will suit your farm depends on—

- Type of farm. Should most of it be in pasture or forage production or is much or all of it suitable for grain production?
- Size of your farm.
- What markets are available in your area.
- Your financial situation.
- How much help is available and what you pay for it.

You can vary your feeding plan—the ratio of concentrates to roughage—to use your available feed to the best advantage. Table 1 gives reasonably realistic estimates of the amounts of feed required per head for various production programs.

Cow herds are particularly adapted to farms that produce large amounts of pasture and harvested roughage and limited amounts of grains. Drylot full feeding of weaned calves, either steers or heifers, requires no pasture—only

TABLE 1.—Approximate amount of feed required per head under various beef-production programs¹

Program	Pas- ture	Average per day			Average per year or per animal		
		Har- vested roughage (hay equiva- lent)	Grain	Protein supple- ment	Har- vested roughage (hay equiva- lent)	Grain	Protein supple- ment
1. 1,000-pound beef cow and calf to weaning (no creep): Pasture	Days 215						
Winter lot, 150 days			20		1	3,000	150
2. Additional to creep-feed calf for 100 days			5			500	
3. Feeding steer calves from 450 to 950 pounds: Dry lot, 250 days (average daily gain, 2 pounds)		5	12	1.5	1,250	3,000	375
4. Feeding steer calves from 450 to 1,050 pounds: ² Winter, 150 days (average daily gain, 1.5 pounds)		8	5	1	1,900	2,150	250
Pasture, 120 days (average daily gain, 1.5 pounds)	120						
Dry lot, 100 days (average daily gain, 2.0 pounds)			7	14	1		
5. Feeding heifer calves from 400 to 750 pounds: Dry lot, 200 days (average daily gain, 1.75 pounds)		4	11	1	800	2,200	200
6. Feeding yearling steers from 700 to 1,050 pounds: Dry lot, 150 days (average daily gain, 2.30 pounds)		7	13	1	1,050	1,950	150
7. Feeding 2-year-old steers from 950 to 1,200 pounds: Dry lot, about 100 days (average daily gain, 2.5 pounds)		10	15.8	1.1	1,000	1,580	110
8. 1,200-pound dual-purpose cow milked 250 days and her calf to weaning ³	215				4,000	1,300	650

¹ This table is based largely on published data. Amounts are approximate and will differ in various sections of the Nation, particularly because of differences in the length of the grazing seasons.

² Deferred Kansas System.

³ Assuming that the cow is milked 250 days and produces 6,500 pounds of milk. She is fed a 16-percent concentrate mixture at the rate of 1 pound for each 4 pounds of milk produced, and is fed a protein supplement during her dry period (winter).

moderate amounts of harvested roughage and relatively large amounts of grain.

Other feeding operations with older cattle and deferred feeding systems with calves effectively use larger proportions of roughage than calf feeding systems. These operations, however, also require grain production on the farm or a local source of grain at reasonable prices if they are to be successful.

Your farm may be best adapted to a system in which cattle are both raised and fattened. For example, part of your farm may be rough, broken, non-tillable land that is best suited for grazing cow herds. If your farm also has tillable land from which you can har-

vest grain and roughage, a system of fattening the animals raised as calves or yearlings may be your choice.

Dual-purpose cattle systems were an important part of the Nation's cattle economy in earlier years. They have become less important with the trend toward larger farms, more specialization, more expensive labor, and more rigid sanitary requirements for the production of dairy products for human use.

Today, the dual-purpose cattle system probably is suitable only to small or medium-sized farms in areas where there is not a ready market for fluid milk and where unpaid family labor is available.

This bulletin discusses the manage-

ment of beef-cow herds. Suggestions are included on raising the calves produced to market ages. Feedlot cattle enterprises are discussed in more detail in Farmers' Bulletin 1549, Feeding Cattle for Beef.

SIZE OF HERD AND EXPECTED PRODUCTION

On most farms, a beef herd is only one of several enterprises. Therefore, considerable flexibility in size of herd is possible.

The herd should include at least 20 to 25 cows. One bull can service a herd this size or somewhat larger. Small herds cost more per cow for bull service. Often, inferior bulls are used in small herds—and calf quality is lower.

Partnership or community ownership of bulls or use of artificial insemination may make smaller herds feasible. Artificial insemination is successful with beef cattle if the cows are observed carefully so that heat can be detected accurately, but it is not available in some areas.

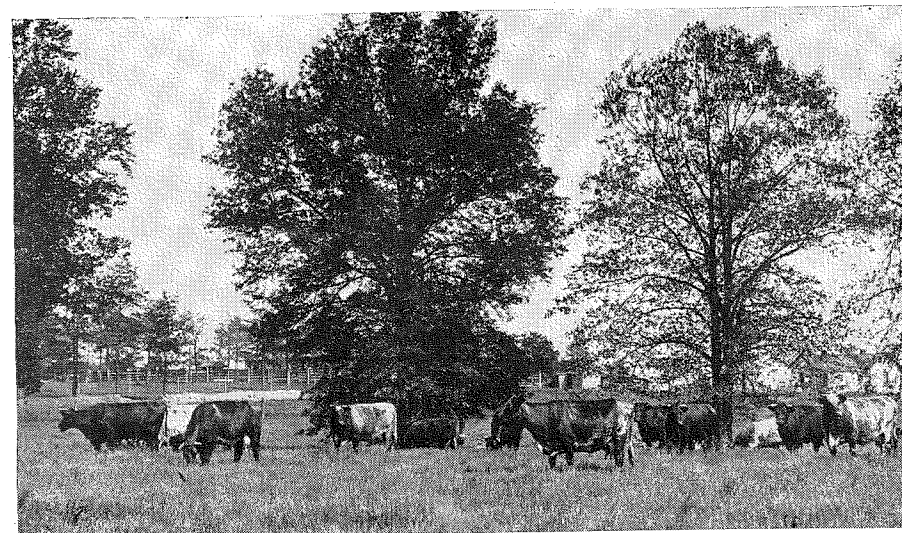
The profit you can expect from your beef herd depends to a large extent on the percentage of the cows that produce calves each year. A survey in 1955 indicated that less than 80 percent of the Nation's beef cows produced calves each year. Properly managed farm herds should exceed this figure, but herds with average calf crops of above 95 percent over a period of years are exceptional. A calf crop of 90 percent is about the attainable average under good management.

Weaning weights vary with the type of cattle and feed supplies, but your calves should weigh an average of 450 to 500 pounds at 7½ to 8 months of age if you are to make money.

SELECTING BREEDING STOCK

Any of the leading beef breeds is satisfactory for farm beef production in areas where they are adapted. You can choose the breed you prefer. The principal beef and dual-purpose cattle breeds are discussed in Farmers' Bulletin 1779, Beef Cattle Breeds.

Crossbred calves of British types



A group of dual-purpose cattle of the Milking Shorthorn breed.

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have given conflicting results in limited experiments, but they probably are more vigorous and grow faster on the average than purebreds or grades with parents of similar quality. However, their superiority is not great, and it is difficult for a small-herd owner to follow a systematic crossbreeding program.

Unless you have a herd large enough to use two or more sires, you probably should use a bull of the same breed as your cows. This will involve a period of "grading up" if you start with a mixed or nondescript group of cows. In some areas, it is difficult to market crossbreds to advantage.

In the Deep South, experiments have shown that crosses between Brahman and British breeds exhibit vigor and growth rates superior to either parental type. They produce carcasses equal to or only slightly inferior to those from British-type cattle, at least when marketed at young ages. The value of Brahman blood is particularly apparent in the cow's calf-raising ability. If you live in an area where some Brahman blood is desirable, you can use a continued crossbreeding program or grades or purebreds of one of the new breeds based on Brahman-British crossbred foundations.

More important than selecting the breed or the crossbreeding plan is selecting breeding stock from within the breed or breeds chosen. This is considered in more detail in Farmers' Bulletin 1916, Beef Cattle for Breeding Purposes.

SELECTING HERD BULLS

If you can find one, an older bull that has been proved on the basis of his progeny to be a superior breeding animal probably would be your "best buy," provided he is free of reproductive disease. Such bulls seldom are available, however, so you probably

will be forced to purchase young, untried bulls.

A bull 12 to 14 months of age can be handbred to 20 to 25 cows in a season or can be allowed to pasturebreed smaller herds. Using bulls this age is risky, however, since their fertility and breeding behavior tend to be uncertain. It is preferable to use a bull at least 18 months old. Under pasture breeding conditions, bulls of this age and older usually will breed 25 to 30 cows satisfactorily in a 70- to 120-day breeding period.

Consider the following factors in selecting a young bull:

- He should be from a sire and dam with good fertility records. If possible, choose a bull from a sire and dam whose other offspring have above-average performance records.

- He should have been raised by his own mother and have had a satisfactory weaning weight. Such a bull will have a good chance of transmitting satisfactory calf-raising ability to his daughters and thus contribute to the longtime improvement of the herd's performance.

- He should have exhibited good gaining ability after weaning and should have a high weight-for-age at 12 to 14 months of age.

- He should be a thick-fleshed animal of desirable conformation, of acceptable breed character, and of an inherent skeletal size that is compatible with producing finished progeny at popular market weights.

- He should be disease free and from a herd with a good health history.

SELECTING FEMALES

As far as possible, use the same standards when buying females for your herd as when buying bulls. Ordinarily, you cannot be so selective.

Cull the cow herd on the basis of regularity of calving and weight and quality of calves produced. If a cow's first calf is poor, her later calves are likely also to be below average. You can safely cull cows in the lower 10 to 25 percent of a herd on the basis of performance records of 1 or 2 of their calves.

For replacements in an established herd, 20 to 40 percent of the heifers raised must be saved if herd numbers are to be kept up (depending on percentage of calf crop, culling intensity among cows, and the age at which cows are replaced). Select heifers with heavy weaning weights, good rate of gain and fattening qualities, and acceptable beef-type conformation.

Keep performance records to help you cull older animals and select replacement animals intelligently. These records need not be elaborate but should include the following:

- Identification of each animal by means of ear tattoos, ear notches, brands, or neck straps.

- A record of the percentage of each calf.

- A record of the birth date of each calf.

- A weight and grade taken at or near weaning to evaluate the dam's maternal ability.

If you keep your calves past weaning age, you should feed and manage all those of each sex alike so that you can evaluate rate of gain from weights taken 6 months to a year after weaning. Grade animals at this time.

When buying herd sires or females from other herds, look for animals from herds where performance records are available. Because management practices and feed supplies have a great influence on records, do not rely solely on the absolute size of the records. Instead, select animals from among the tops in a herd.

RAISING REPLACEMENT BREEDING ANIMALS

Good pasture is the best and, usually, the cheapest feed for developing replacement heifers following weaning. However, heifers usually are weaned in the fall and must be fed through the winter in dry lot. The level of feeding to be used the first winter following weaning should depend largely on

whether you plan to breed the heifers at 14 to 16 months of age to calve at about 2 years of age or whether you plan to breed them to calve first at about 3 years of age.

If you plan to breed them for early calving, feed them during the first winter so that they gain 1 to 1½ pounds per day and weigh 600 pounds or more at breeding.

Rations that should accomplish this are as follows:

	Pounds
1. Corn or sorghum silage.....	25 to 30
Grain.....	3 to 5
Protein supplement.....	1
2. Legume or mixed hay.....	12 to 15
Grain.....	3 to 5
3. Corn or sorghum silage.....	20 to 25
Legume hay.....	3 to 4
Grain.....	3 to 5
4. High-quality grass hay.....	12 to 15
Grain.....	3 to 5
Protein supplement.....	1

These heifers will require similar rations during their second winter just before calving.

If you postpone breeding so that heifers drop their first calves as 3-year-olds, you can feed them more limited and economical winter rations and depend on summer pasture to produce most of the growth.

Rations that can be expected to produce gains of ¼ to ¾ pound daily during the first winter are:

	Pounds
1. Legume hay.....	4 to 6
Low-quality nonlegume roughage, such as straw, low-quality grass hay, or cottonseed hulls.....	6 to 8
2. Corn or sorghum silage.....	20 to 25
Cottonseed, soybean, or linseed meal, or other high-protein supplement.....	1
3. High-quality grass hay.....	12 to 15
4. Low-quality grass or legume hay.....	10 to 15
Protein supplement.....	1
5. Legume hay.....	3 to 5
Corn or sorghum silage.....	6 to 10
Grain.....	2 to 3

In many parts of the country you can winter heifers more cheaply on permanent pasture than in dry lot on harvested feed even if pastures are low in quality. Feed protein supplements at the rate of 1 to 2 pounds daily if you do this.

Usually, bulls should be fed rather liberally from weaning to 12 to 14 months of age. This promotes rapid development and makes breeding use possible at minimum ages. Also, liberal rations during this period give a bull an opportunity to show his inherent ability to gain, fatten, and develop satisfactory conformation. His ability in these respects is related to the potential performing ability of his progeny. Thus, selecting and using bulls with above-average performance during this period should lead to improved herd performance.

FEEDING AND CARING FOR BREEDING BULLS

As a general rule, a bull requires more feed than a cow. How much more depends on his size and age and how heavily you use him.

Fertility is likely to be best if bulls are kept in medium flesh and can exercise at will. Too much fat wastes feed and money and may result in poor fertility. Bulls that are too thin also may have breeding difficulties.

During the grazing season, good pasture will provide most of the bull's nutritional needs. Usually, however, young growing bulls need some supplementary grain to keep in satisfactory flesh. If used on a seasonal basis, most bulls are likely to lose 200 to 300 pounds during the breeding season. They must gain 1 to 1½ pounds a day during the rest of the year to regain this loss.

Older bulls usually will maintain desirable condition on good pasture in

summer and roughage in winter. To provide enough carotene, which the animal can convert to vitamin A, at least half of the roughage fed (dry basis) should be good legume hay or corn, sorghum, or grass silage. If none of the roughage is legume, 1 to 2 pounds daily of a high-protein supplement should be fed.

Although there is no scientific evidence to confirm their idea, many breeders think it is desirable to stop feeding silage about 30 days before the breeding season. Usually, some grain is fed for 30 to 60 days before the breeding season, and during the breeding season when this is possible, to improve breeding performance. One pound of protein supplement and 5 pounds of grain daily should be ample for most bulls. The condition of the bull should govern the amount of feed offered.

Do not allow the herd bull to run with the cows the whole year. If possible, keep him in a separate enclosure during the nonbreeding season. If you cannot keep him in a pasture by himself after the breeding season, pasture him with steers or pregnant cows. A bull in good breeding condition is likely to be temperamental. Always handle him with care.

The fence around the lot or corral where you keep the bull should not stop him from seeing other cattle but should be securely constructed. For an added safety factor, install a battery-operated "charged-wire" device on the inside of the fence enclosing the lot or corral. Find the best location for the wire by trial; a height of about 2 feet is suggested.

FEEDING AND CARING FOR THE COW HERD

Cows produce fewer pounds of meat per hundred pounds of live weight than

any other class of farm animal. Because feed required for maintenance is roughly proportional to live weight, beef cows must be fed as much as possible on low-cost roughage and waste and byproduct feeds if they are to compete successfully with other classes of livestock.

In all beef-cow herd operations a middle level of nutrition is the most profitable. Feeding above this level will increase expense without commensurate increase in production. Keeping cows too fat may decrease fertility and milk flow. Undue limitations on feed quality and quantity will reduce productivity—particularly the percentage of calf crop—and thus reduce net income.

Pastures are the natural feed for beef cattle, and cows on good pasture ordinarily will not need supplemental feed. Some cattlemen think that beef cows on extremely succulent pasture early in the spring benefit if they are fed some hay or other dry roughage.

If pastures are short because of drought or overgrazing, supplement with hay, silage, green corn, or other roughage.

If you wean your calves in the fall, you may be able to maintain your beef-cow herd until well into the winter on meadow or small grain aftermath, on stalk fields after corn has been harvested, or on permanent pasture where grass has been allowed to accumulate during the late summer. They can get most of their roughage from such material—feed that might otherwise be wasted. Usually this roughage is low quality, because it is mature and low in protein. If this is so, feed about 1 pound of protein concentrate per head daily.

Start winter feeding when pasture

conditions demand it and before the cows lose much weight. Supply feed in small amounts at first and increase as necessary. Usually, feed the poorest hay or silage first and save the best roughage for late winter and the calving season. In many climates you can feed your herd on permanent pasture sod. This saves cleaning and manure hauling during the busy spring season.

Feed cows, yearlings, and calves separately. Separate cows into small groups for winter feeding so that the "bossy" cows can be separated from timid ones.

Rations for dry beef cows can vary widely, because they depend on the feed available. Include a source of vitamin A in the ration. You can meet a cow's daily requirements for vitamin A by feeding about 5 pounds of green-colored hay or 15 or more pounds of silage preserved so that its green color is well maintained.

A succulent feed is desirable but not essential in the ration of the dry beef cow. Silage is the most widely used feed of this type. Corn, sorghum, and various types of grass silage are excellent. Stock carrots or other root crops also are excellent, but they are not used much because of the labor needed to grow and harvest them.

To maintain weight, a beef cow needs about 2 pounds of dry matter daily per 100 pounds of live weight. Much of this can be straw, low-quality grass hay, corn stover, ground cobs, cottonseed hulls, and similar materials. Feed good-quality hay or silage in limited amounts or a cow will eat more than she needs and increase feed costs unduly.

Some examples of suitable rations for dry, pregnant cows weighing about 1,000 pounds follow:

	<i>Pounds</i>
1. Legume or mixed grass-legume hay -----	16 to 25
2. Legume hay -----	5 to 10
Straw or low-quality grass hay -----	10 to 15
3. Corn or sorghum silage -----	30
Legume hay -----	5
Straw, low-quality grass hay, cottonseed hulls, ground corncocks, or other low-quality roughage -----	Unlimited
4. Cereal straw -----	Unlimited
Protein supplement -----	1
5. Corn or sorghum silage -----	50 to 60
Protein supplement -----	1
6. Prairie or grass hay -----	Unlimited
Protein supplement -----	0.5 to 1.0
7. Grass silage -----	30 to 40
Straw or low-quality grass hay -----	Unlimited

There has been some interest in wintering cows or heifers entirely on low-quality roughage such as ground corncocks or cottonseed hulls plus 2 to 3½ pounds daily of a highly fortified protein supplement like Purdue Supplement A.

Formula of 32-percent crude protein Purdue Supplement A:

	<i>Pounds per ton of mix</i>
Soybean meal (44 percent) -----	1,286.2
Molasses feed (45 percent molasses) -----	571.6
Bonemeal -----	102.8
Salt -----	34.4
Vitamin A and D concentrate ¹ -----	5.0

¹ Concentrated cod-liver oil with potency of 2,250 International Units of vitamin A and 300 International Units of vitamin D per gram.

A ration of 14.5 pounds of ground cobs, 3.5 pounds of supplement A, and 1 pound of ground alfalfa has proved satisfactory for wintering pregnant cows. Feed prices and availability determine whether you should use rations of this general type. Cost easily can be greater for rations of this type than for more conventional rations and no evidence indicates better results.

Unless your hay or silage is of very good quality, to stimulate milk flow

you must feed concentrates to cows that drop fall calves and nurse them during the winter. Add 3 to 5 pounds of a 16-percent protein concentrate mixture to any of the rations listed. Silage is especially valuable for cows nursing calves.

When cows calve in early spring before pasture is available, feed them more liberally after their calves are large enough to benefit from an increased milk flow.

Except in the Deep South most of the perennial summer pasture grasses used for permanent pastures are dormant and have low nutritional value during the winter. If you use them for grazing during winter, feed a protein supplement. Usually it is more economical to feed harvested forage for a time each winter except in the most extreme southern areas.

In much of the South, well-fertilized temporary winter crops such as rye, oats, ryegrass, or mixtures of these with crimson clover will furnish grazing during the winter months. Productivity varies greatly, depending on the severity of the winter and moisture conditions, and these crops are expensive to produce. Usually, when beef cows have unlimited access to the pastures, these crops furnish better grazing than is needed. Even cows nursing calves fatten excessively on such pastures. Grazing cows on such pastures for limited periods of 2 to 4 hours daily and feeding harvested roughage for the remainder of the daily ration can be economical and highly satisfactory.

If you live in the South, you can seed crimson clover in permanent sods to increase forage production in late winter and early spring and obtain excellent feed for cows and calves. The reseeding type of crimson clover eliminates the work involved in an annual seeding.

CARING FOR COW AT PARTURITION

The average gestation period of the cow is about 283 days, or about 9½ months. A variation of as much as 10 days either way from the average gestation length is not unusual.

As parturition approaches, the udder becomes distended with milk and there is a marked "loosening" or falling away in the region of the tailhead and pinbones. The vulva swells and enlarges considerably.

When cows calve during the grazing season, a clean pasture is the best place for calving. Chance of infection and injury is less than in a barn. Often, you can segregate cows expected to calve in a small pasture near the farmhouse where they can be frequently observed. If this is not possible, check the pasture at least twice daily during the calving season.

If you expect a cow to calve during severe weather, put her in a clean, well-ventilated box stall that has been disinfected or in a small pasture with underbrush or protected shelter. Cows in large herds normally calve without any change in ration. If you can provide individual care, reduce the daily ration as calving approaches and incorporate into the diet some mildly laxative feeds such as linseed meal or bran mash. This is helpful if the cows are on dry feed. Silage or other succulent feed is valuable at this time. However, cows getting only high-quality dry roughage usually get along well at calving time.

Most cows will calve normally without assistance. Be alert for signs of trouble and assist or call trained help if needed. If the cow has severe labor for more than 1 to 2 hours without result, assistance usually is needed.

If the calf does not immediately begin breathing when it is born, wipe out any mucus in its mouth or nostrils. Induce natural breathing either by forcing air into the lungs with a bellows or

by alternate compression and relaxation of the walls of the chest.

In cold weather, protect the calf and keep it warm until it is dry and on its feet. Disinfect the navel of the newborn calf with iodine, as a precaution against navel ill.

After the cow has calved, give her all the water (preferably lukewarm) she desires. Return ration to normal in a few days. If the cow is an exceptional milk producer, she may have more milk than the calf can take the first few days. Milking out the surplus milk for a few days may make the cow more comfortable. However, many cattlemen in recent years have adopted the practice of milking only when the calf fails to nurse one or more teats. The milk output quickly adjusts to what the calf can take. Failing to remove excess milk does not increase the frequency of spoiled udders.

AGE AT WHICH TO BREED HEIFERS

If calves are to be dropped in a herd at only one season of the year, the owner must decide whether to breed heifers to calve first as 2-year-olds or 3-year-olds. At present no general recommendation can be made.

Several experiments have been carried out on this problem. It has been found that heifers bred to calve first as 2-year-olds will raise an average of approximately 0.7 more calves during their lives than heifers bred to calve first as 3-year-olds. Mature size is affected little if at all and length of productive life apparently is not reduced.

Disadvantages of calving first at 2 years of age are—

1. Heifers raise a smaller calf crop in their first calving season than if bred to calve first at 3.

2. A higher than average number of heifers calving at 2 often fail to rebreed to calve the next year.

3. A high number (about 50 percent in one survey) of heifers require help at calving.

4. Death losses may be higher than average.

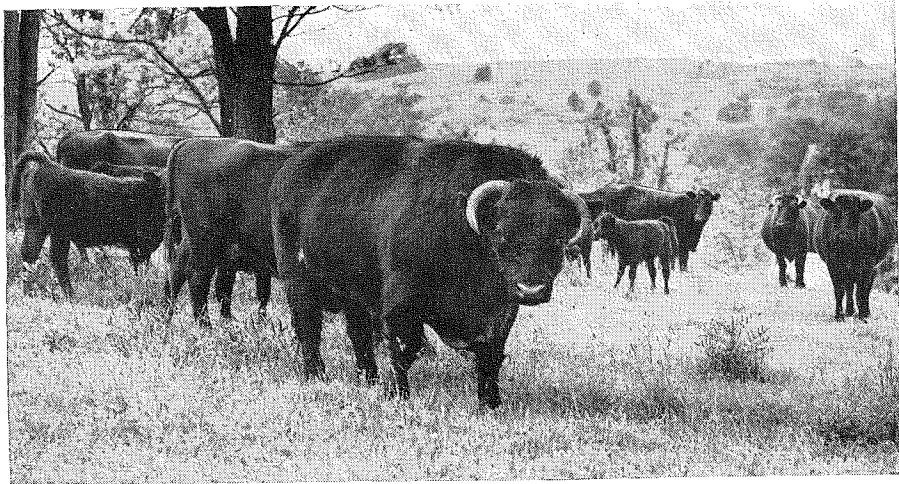
5. Calf losses usually are higher than average.

The importance of these disadvantages has varied from experiment to experiment—in some cases, results have been so bad as to discourage the practice.

It would appear that breeding to calve first at 2 is profitable and is to be encouraged if (1) heifers can be grown rapidly and weigh 600 pounds or more at breeding, and (2) experienced help will be available at calving time and will have the necessary time to give special attention to the heifers. Breeding heifers to small, fine-boned bulls will minimize calving troubles but if this is done all the resulting calves should be marketed. This usually is not feasible in small farm herds where only one bull is used annually.

SEASONAL CALVING

In many farm beef herds, the bull is allowed to run with the cow herd the year around with the result that calves of all ages are on hand.



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A herd of Shorthorns grazing rough land suitable only for grazing purposes. The bull in the foreground shows good size and desirable beef conformation.

Although this system may result in more calves being raised over a period of years, if your herd is small it usually is preferable to limit breeding to a season of 2 to 4 months. If you limit breeding to a short period, you can choose the most favorable season for calving for your area. This system facilitates uniform and systematic management of the calves. If your herd is large, systematic calving at two seasons a year may be desirable and may increase calving percentages slightly since cows failing to settle in one season can be bred in the next. You can breed heifers to calve first at about 2½ years of age, which may be preferable to either 2 or 3 years.

Most beef calves are dropped in the spring. If weather is suitable, have calves born 6 weeks to 3 months before pasture season begins so that the calf is large enough to use the increased milk flow when the dam goes to pasture. Because it usually is necessary to wean calves at the end of the pasture season in the fall, having them born fairly early in the spring will result in older,

heavier, and more valuable calves at weaning.

Fall calving requires more harvested feed for the cow herd. In the North, fall calves seldom do as well as calves born in the spring; fall calving, therefore, is justified only under special circumstances. In the South late fall or early winter calving often is desirable because of the relative freedom from screwworms at this season. Local circumstances and feed supplies should determine the time of the breeding season.

CREEP FEEDING CALVES

Creep feeding is feeding concentrates to nursing calves in enclosures that their dams cannot enter.

Giving 80- to 90-day-old nursing calves access to a concentrate mixture in a creep placed in the pasture where shade and water are available and where cows gather usually increases gains and the amount of finish carried at weaning.

Whether creep feeding will be profitable depends on the system of management and, to some extent, on the milk-producing ability of the dams. Calves from dams with good bred-in milk-producing ability get little benefit from creep feeding. Creep feeding often must be resorted to in drought years when feed supplies for cows are short and their milk production is reduced.

Since milk is high in protein, grain alone is a satisfactory creep feed. Feed grain, whole, cracked, or coarsely ground. Often, adding a small proportion of protein supplement (1 part of supplement to 6 to 9 parts of coarsely ground grain) will improve palatability. Calves eat an average of about 500 pounds of feed if they have free access to creeps after they are about 90 days old. The amount eaten varies greatly from herd to herd, however.

Creep feeding often will pay (1) in purebred herds where the finish that calves exhibit at weaning may have advertising value, (2) in commercial herds when the calves are to be marketed at or soon after weaning as fat baby beefs, and (3) during drought or other emergency.

Creep feeding ordinarily will not pay if calves are to be carried through a winter on limited rations prior to grazing for one or more seasons before marketing.

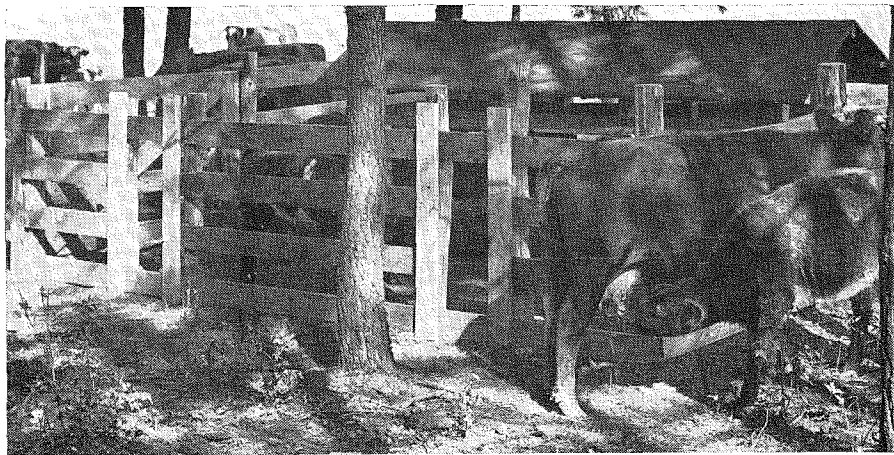
CALVES FROM DUAL-PURPOSE COWS

Calves from dual-purpose cows formerly made up a substantial proportion of the Nation's beef supply. Raising calves from dual-purpose cows is not likely to be profitable unless unpaid family labor is available. They usually are raised by one of two systems. With the double-nursing system, 2 calves of about the same age are suckled by 1 cow. The calves get along nearly as well as when they run with their own mothers in a strictly beef herd, although considerably more labor is involved. With this plan, half of the cows in the herd may be used for the production of milk.

With the other system, calves are taken from their dams on the fourth or fifth day after birth and bucket fed.

To teach a calf to drink milk, first permit the calf to suck your fingers and then immediately immerse your fingers in a bucket of milk. When the calf begins to take the milk in this way, withdraw your hand from the bucket. Buckets with rubber nipples often are used. This eliminates having to teach the calf to drink. After each feeding, clean and disinfect buckets and other utensils. Use a chlorine solution or a similar disinfectant.

Three or four pounds of whole milk are enough for a day or two after weaning. If the calf refuses to drink, do not



A calf creep located in a shady area where cows congregate.

force it; take the milk away. Twelve hours later, at the next feeding time, the calf probably will take milk. Increase the quantity by about a pound a day until the calf is getting 8 to 10 pounds a day.

After feeding whole milk for 10 days to 2 weeks, gradually replace it with skim milk. Make the change over a period of 5 to 7 days. Skim milk contains less energy and less vitamin A than whole milk. Feed a small quantity of cod-liver oil or other fish oil rich in vitamin A. If you have enough skim milk, increase the amount gradually each week until you are feeding 15 to 20 pounds per calf per day. If you want to conserve the milk supply, 12 to 14 pounds will be enough, provided you feed the calves enough suitable grain mixture, a protein supplement, and good hay.

Stop feeding cod-liver oil or other source of vitamin A after calves begin to eat hay, silage, or grass, provided the hay is green and leafy or the silage or grass has some green color. Be sure the calves have access to clean, fresh water and salt at all times. Calves readily learn to eat grain and should

receive a limited amount each day from the time they are about 3 weeks old. Equal parts, by weight, of wheat bran, ground oats, and coarsely ground corn or barley is a suitable grain mixture.

As soon as possible, put the calves on pasture. If pasture is not available when calves are about a month old, cut and feed some growing crop or give them a small quantity of silage or carrots. Feed calves running on green pasture or confined in a lot or corral a little clean, bright hay from a rack.

WEANING CALVES

Wean calves that have been running with their dams on pasture by taking them away from the cows and confining them in a pen or barn out of sight of their dams and other cattle. Preferably, they should be far enough away from their dams to be out of hearing distance, but this is difficult on most small farms. Offer the calves some good hay and a small amount of grain during this period. Unless they were creep fed, they will eat little for a few days.

It formerly was recommended that calves being weaned be put back with

their dams to nurse at increasingly less frequent intervals over a period of about 2 weeks. It was felt that this was necessary to prevent spoiled udders in cows and that it was less disturbing to the calf.

It now is known, however, that the safest and most effective method of drying off even high-producing dairy cows is to quit withdrawing the milk. The pressure built up stops further secretion. It is believed that both the dams and the calves will be better off if the calves are taken away and not put back with the cows.

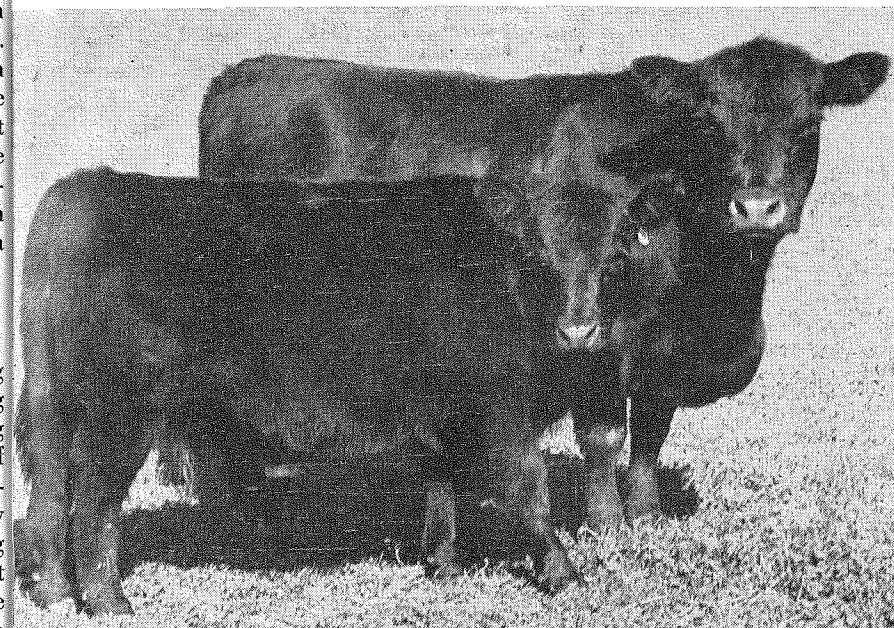
Weaning bucket-fed calves is comparatively simple. Milk usually is withdrawn from the ration by the time they are 6 to 7 months old. If they have learned to eat hay and grain, the quantity of milk fed may be greatly

reduced or eliminated several weeks earlier without stunting the calves.

DEHORNING AND CASTRATING

In commercial herds, and often in purebred herds, it is advisable to dehorn calves of horned breeds. This can be done most easily before the calves are 3 weeks old. At that age, the tender horn "buttons" first appear. Scrape them with a knife to irritate the surface. Prevent horn growth by carefully applying the slightly moist tip of a caustic pencil (stick of potassium hydroxide). The caustic causes a scab to form on the irritated area. After a few days, the scab shrivels and falls off, leaving a hornless or "polled" head.

Commercial liquid and paste preparations may be easier for many people to use than the caustic sticks. Young



A productive 3-year-old Angus cow and her first calf raised without creep feeding. This calf graded high choice at weaning, and on a mature-dam basis had a daily gain of 2.09 pounds. Productive cows such as this are moneymakers. (Courtesy of Tennessee Agricultural Experiment Station)

calves also can be dehorned by applying a heated iron to the base of the horn button. Electrically heated irons are convenient and satisfactory for use on many farms.

Male calves must be castrated to produce beef meeting American market requirements. Perform the operation preferably at a time of year when flies are not prevalent and before the calves are 3 to 4 months old. Some cattlemen castrate calves when taking birth weights.

Spaying of heifers seldom is practiced in farm herds. Contrary to the former belief, spayed heifers actually make slower gains and have no carcass superiority. Heifers should be spayed only on farms where they are being fattened and it is impossible to keep them separated from bulls.

Detailed instructions for dehorning, castrating, and marking cattle may be obtained from your county agricultural agent or the U. S. Department of Agriculture.

SALT AND OTHER MINERAL REQUIREMENTS

At all times, supply stock with clean, fresh water and loose or block salt. On the average, cattle will consume about 2 pounds of salt a month—less for calves and more for steers on full feed and mature cows.

Requirements of cattle for other minerals vary from area to area and with the type of ration. Consult your county agricultural agent about probable needs in your area.

In some parts of the country, iodine is deficient. This deficiency leads to goiter or "big neck" in newborn calves. In these areas iodized salt should be fed. In other areas cobalt, copper, iron, and possibly other trace minerals are known to be deficient. These should be supplied.

Calcium often will be needed if beef cattle are not fed legumes or if the pas-

ture is low in calcium. Phosphorus is deficient in the soil in many areas. Plants grown on these soils also are low in this element. Low-quality roughage, and mature, weathered hay and grasses that are low in protein and carotene also are likely to be low in phosphorus.

Ground limestone usually is the cheapest calcium supplement. Phosphorus may be supplied in the form of steamed bonemeal, dicalcium phosphate, or defluorinated phosphates. Supplements should be fed as required in specific localities. Both calcium and phosphorus supplements usually are fed in mixtures with salt.

FEEDING CATTLE FOR MARKET

Many farmers with beef herds find it practicable to fatten the calves raised. The system used may be immediate full-feeding on heavy concentrate rations. An increasingly popular system of handling farm-raised steers, however, is to winter them at moderate nutritional levels the first winter, graze them a season, and then full feed them for 60 to 100 days just prior to marketing. This system permits marketing 18- to 20-month-old steers at approximately 1,000 pounds that grade in the high-good to low-choice range. Heifers can be handled under either system but ordinarily should be marketed at lighter weights than steers since they fatten more rapidly.

CONTROLLING DISEASES AND PARASITES

Maintenance of animal health is a prerequisite to profitable beef production. Numerous U. S. Department of Agriculture bulletins on control and prevention of specific diseases and on control of internal and external parasites are available. Write to the Department for bulletins or ask your county agricultural agent for help.