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Facts About Beef Production and Getting a Herd Started
Beef and Cow Management

Michigan State University Extension Service

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BEEF COW MANAGEMENT



FACT SHEET 101, January 1977

Facts About Beef Production and Getting a Herd Started

This bulletin is designed to provide information on some of the fundamentals of breeding, feeding, managing and handling beef cattle. All of these areas are discussed in detail in other fact sheets; this is only an introduction to beef production. Your local cooperative extension service office will be able to help you with specific questions you have in regard to your operation.

Establishing a Beef Herd

Beef Herds in the U.S.

Nearly half of the beef cows in the U.S. are in herds of less than 50 beef cows, and two-thirds are in herds of less than 100 beef cows. Thus, the typical beef herd is small and supplementary to some other enterprise. Feed resources used are those that have little alternative use such as crop residues, marginal cropland, untillable land or rangeland that cannot produce crops other than grass due to limitations in rainfall. Also, people who own land but work full-time off the farm find that beef cows are often the best way to utilize land that is not tillable or cannot be profitably rented as cropland to nearby farmers, or where they wish to utilize it themselves on a part-time basis. Most people with beef cattle use surplus labor to operate the herd, and most of the work such as calving, weaning, vaccinations, castration, weighing etc. can be planned at times when labor is available. Therefore, it works well with cash grain, orchard, or vegetable crop operations. For these reasons, a beef cow herd fits best as a supplemental enterprise to utilize surplus labor and those feed resources that have little alternative use. Also, it works best with enterprises that provide a more regular income. This is because a beef herd usually provides income only once a year and it takes several years before

initial costs are offset due to the slow turnover rate. Decide (1) how regular and how soon income must be from a beef enterprise, and (2) whether it is to serve as a means of increasing net worth from surplus feed and labor resources, and/or as a "savings bank," or (3) if this income must be the major source of income.

Getting a Beef Herd Started

Since the beef herd is a long-term investment and considerable time is required to attain your objectives, make some long range plans and answer the following questions before getting started:

1. *Do you want to be a registered or commercial breeder?* The registered breeder maintains a beef cow herd to develop and provide superior seedstock, mostly bulls, for other breeders. He must make large capital investments and seedstock to initiate and constantly improve his herd to provide the type of cattle that are most efficient for the beef industry. He needs to develop a selection program based on traits of greatest economical importance such as fertility, growth rate, and carcass merit. He must have a clean, neat farmstead, be willing to advertise and to receive visitors at all times, and be patient while building his reputation. There is a need for top seedstock producers, but it is a very competitive business, especially if you are trying to compete with well-established purebred herds.

The commercial breeder maintains a beef herd to provide feeder calves to be fed out for slaughter. This includes most of the beef herds in the U.S. He must perform many of the same operations as the purebred breeder, such as close culling for long-term success. He may keep a variety of breeds and crosses to achieve his goals, whereas the purebred breeder will likely keep only one breed.

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2. *Do you want to have a full-time or part-time enterprise?* The size of operation needed to satisfy these objectives must be determined. For a full-time enterprise, usually 150 to 300 commercial beef cows must be kept to provide a reasonable return to labor and management if the calves are sold at weaning. Annual net income per cow is usually doubled, however, when the calves are also fed to normal slaughter weights, depending on feed costs and market conditions.

The size of operation needed for success on a part-time basis is more difficult to determine. It depends on what costs must be charged against the beef herd and what the goals are. Many are successful with as few as 10 cows where the property taxes and interest need not be charged against the cattle and the winter feed supply can be obtained economically. Others may need 25 to 50 beef cows for the part-time operation to be successful, where equipment must be purchased to make hay and where land taxes and interest must be considered.

3. *When is the best time to calve?* Those selling calves in the fall at the end of the grazing season should calve in the late fall, winter or early spring to achieve maximum weaning weight by the following fall. This is not as important for those who feed out their own calves.

More management and protection is needed for fall and winter calving, but spring calving may interfere with other farm enterprises. After considering these factors, schedule the calving season before purchasing the cows, in order to get them at the correct stage of the reproductive cycle so they calve at the desired time.

4. *What breed of cattle is best for you?* There are many breeds of cattle that can successfully be used and each has its strong and weak points. Angus, Hereford and Shorthorn are generally noted for their good fertility, mothering ability, winter hardiness and ability to deposit intramuscular fat (marbling). These British breeds have been popular because of their ability to thrive on a minimal level of nutrition, such as on our western ranges. Cattle with Brahman blood are popular in the south because of their heat tolerance. Many Continental European breeds such as Charolais, Simmental, Limousin, Maine-Anjou and Chianina have been introduced to the U.S. and used for crossing with our traditional breeds to take advantage of heterosis (hybrid vigor) and to increase growth rate and muscling of the calves while still taking advantage of the lower maintenance costs, hardiness and mothering ability of the British breeds. Crossing Angus, Hereford or Shorthorn cattle with dairy breeds also produces excellent cross-bred females. The cattle available in your area and the kind that work best in your environment are major factors to be considered in selecting breeding stock.

Detailed breeding plans are discussed in other fact sheets. In general, however, if you have a plentiful feed supply and wish to have only a fixed number of cows, then larger type cattle are likely to be most profitable; perhaps even a dairy-beef crossbreed female bred to a large, muscular bull to get the most pounds of calf per year. If feed supplies are to be used at maximum efficiency, then medium sized, moderate-milking, beef-type females bred to large bulls are likely to be the best. In any event, select a breed or combination of breeds that you will enjoy working with.

5. *Do you have adequate feed, water, and fencing?* The number of cattle that can be carried on the available feed and water supply must be considered before purchasing cows. The nutrient requirements of a beef cow and fencing considerations are discussed later, and are given in detail in other fact sheets.

6. *Where should you purchase the cattle?* There are many sources of cattle, and no one source is best for all conditions. In general, the beginner should purchase breeding cattle from a successful, reputable cattleman, locally if possible. This gives you some assurance of being treated fairly. He is likely to be concerned about maintaining his reputation and is usually willing to provide advice.

Also, cattlemen's or breed association sales may be a good place to buy breeding stock. They usually have high standards, and are concerned about their reputation and people's confidence in their sales.

Beware of purchasing breeding stock from unknown herds, questionable cattle dealers or auction sales or you may end up with someone's culls or problem cattle.

7. *Do I buy heifers or mature cows?* It is usually best for the beginner to buy bred cows that have had at least one calf. This eliminates having to get them bred the first time, and reduces the calving and mothering problems. If heifers are purchased, an inexperienced operator should not breed them to a large type bull until they have had at least one calf. Usually, at least one-third of the heifers will have some calving difficulty and must be assisted. However, if heifers are the best buy and appear to be the preferred way to start, observe them closely and be aware of the problems that can occur at calving time.

8. *Handling cattle.* Differences between breeds in disposition is a debated subject among cattlemen. Experience and observation indicates that any breed can be managed if they are handled properly. Some guidelines for handling cattle:

a. Always move cattle slowly and carefully; sudden movements frighten them. If you move them with care, the dominant cows will eventually lead the herd towards any opening you have made once they can see where they are to go.

b. When feeding or working with cattle in a small herd, pet or scratch them to gain their confidence. They will be much easier to move, handle and treat if they are gentle and not afraid of you.

c. Avoid using electric prods or other devices that cause pain.

d. Avoid loud noises around cattle. Their ears are sensitive, and sharp noises can startle them.

Always remember that frightened or wild animals are not apt to go where you want them, and are much more likely to break down fences and equipment. Furthermore, nervous cattle are much more difficult to corral if they once get out.

Housing, Equipment and Fencing

1. **Housing:** Beef cows do not need elaborate housing and do best if kept outside under most conditions. One of the least desirable practices is to shut them up in a barn because it can lead to scours and respiratory problems. Forages in the diet produce large amounts of heat that can be used to maintain body temperature. The critical temperature (temperature below which extra energy is needed to keep warm) of a mature beef cow with a thick hair coat is below freezing. The most important protection needed is from wind (every one mph of wind increases the critical temperature at least 1°F), cold rain (cold rain mats down the hair coat and increases the heat loss to the environment) and mud. Access to a woodlot or a barn that is open on one side is adequate for most cow herds. In addition, a shed or barn for hay storage is usually required, except for those hay systems utilizing large packages that can be stored outside.

It is a good idea to have some sheltered calving pens where cows with new calves can be held for a few hours or days until the calf is off to a good start. It is also advisable to have an area for wintering first and second calf heifers separate from mature cows.

2. **Equipment:** An adequate year-round supply of clean, fresh water is basic to any successful livestock enterprise. Beef cattle are no exception to this rule. The water supply should be free of ice in the wintertime. In the northern states, automatic freeze-proof water fountains are usually a good investment. In order for various classes and ages of cattle to be fed separately, the wintering area should be divided into several lots, necessitating more than one fountain.

Although many small farms do not have a cattle handling facility, it is really needed to carry out good management practices. An effective working facility should at least consist of a corral, chute, and headgate. Without a handling facility, it is virtually impossible to perform certain jobs such as vaccination, pregnancy testing, artificial insemination, etc.

Other equipment needs include salt-mineral feeders, feed bunks and hay racks (unless hay is fed on dry or frozen ground or on the snow). In addition, a tractor with front-end loader, a manure spreader, and a hay wagon are needed on most beef cattle farms.

Plans for building your own equipment can be obtained from many sources, including your local extension office.

3. **Fencing:** A well-built outside fence around your farm can save many frustrating hours spent chasing cattle. The first step in fence building is to set good corner posts to which the fence can be stretched and fastened. Use 8-foot treated posts that are at least 6 inches in diameter. Place about 3 to 4 feet in the ground and 4 to 5 feet above ground. Old railroad ties also work well. Place one post at the corner and another 8 to 10 feet down the line for a brace post. Place a 4 x 4, another post, or a large steel pipe from the top of the brace post to the top of the corner post, and bind the top of the brace post to the bottom of the corner post with no. 9 guage wire (see Figure 1).

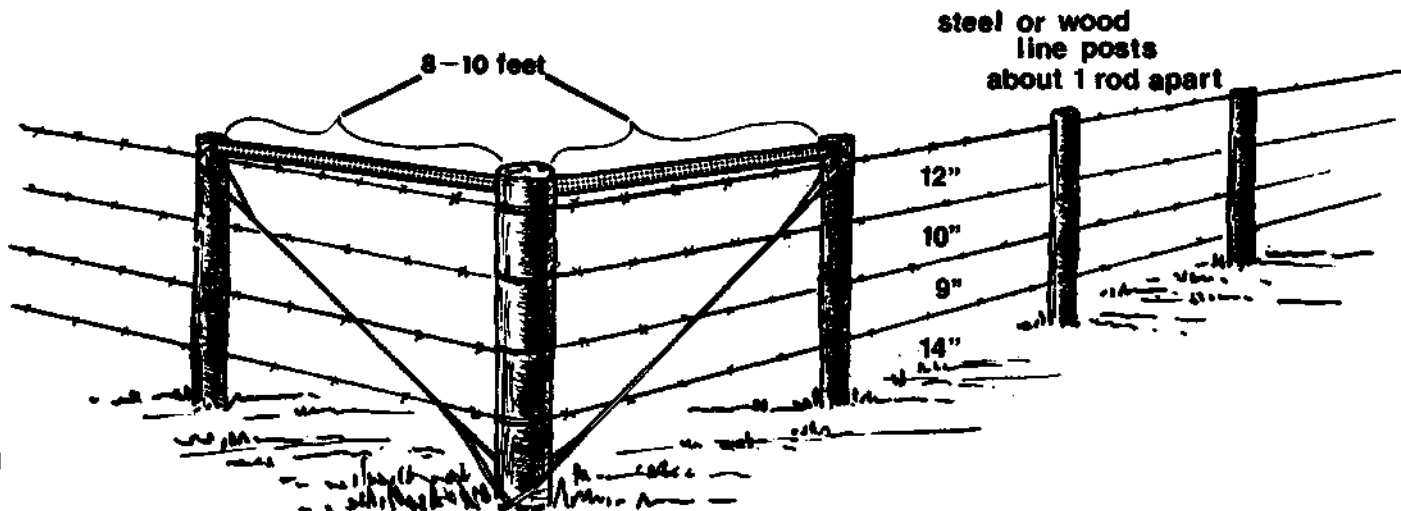


Figure 1. This diagram illustrates one correct method of building a fence for beef cattle.

A two- to three-strand electric fence can be used for interior fencing but should not be relied on for the perimeter of your farm property. There, use four to five strands of barbed wire on steel or wood posts spaced 1 rod apart.

General Management Tips

Record Keeping

Keep a record of all deductible expenses and income (supplies, repairs, gas and oil, fertilizer and seed, medication, utilities, depreciation on breeding stock, buildings and equipment) for income tax purposes. Records help you analyze the efficiency of your operation and aid in cost control, herd improvement, determining changes in net worth and as an aid in financing. See a tax accountant for details.

Identification and Performance Records

Identify each cow and calf and keep a record of birth date, weaning weight and dams of all calves. Most states and breed associations have performance testing programs that can help you analyze your herd's performance. See your local extension agent for details. Brood cows can be identified with brands or large ear tags. Calves can be best identified with ear tags.

Marketing the Calf Crop

There are generally about five alternatives for marketing weaned calves. They are discussed in detail in Fact Sheet 5200.

1. Feeder calf sales.
2. Breeding cattle sales.
3. Direct to a feedlot operator.
4. For 4-H or FFA projects.
5. Feed them out yourself.

Castration

Castrated male calves are usually in greater demand for feeding than intact males as they are easier to handle in a feedlot and there is still discrimination against steak and roast meat from bulls. The beef from young bulls slaughtered by 15-18 months of age is usually just as palatable as steer or heifer beef; however, it is still preferable for male calves to be castrated sometime from birth to weaning. Several methods are used:

1. **Knife method.** Slit the side of the scrotum or cut off the lower one-third of the scrotum, squeeze out the testicles and cut off the chord that is above the testicle.

2. **Burdizzo clamps.** Work the testicle to the side of the scrotum, then clamp the chord with a Burdizzo clamp above the testicle and hold for a few seconds to crush the chord.

3. **Elastrator.** Can be used on calves up to two months of age. A rubber ring is expanded by a special tool called an elastrator. Then the ring is placed at the top of the scrotum and the tool is released. The circulation to the testicle is cut off by the ring and the testicles dry up and fall off.

Dehorning

Clip the hair around the horn and apply caustic paste to the horn button of newborn calves. A saw, electric dehorner, or other devices must be used on older cattle with developed horns.

Health

Read herd health fact sheets to become familiar with various cattle diseases and their prevention. In general, good disease prevention includes vaccinating cows after calving (but at least 3 weeks before breeding) for IBR-PI₃, leptospirosis, and vibriosis, and heifers for brucellosis and IBR-PI₃ between 3 and 7 months of age. Disorders such as bloat, scours, pneumonia, pink eye, foot rot, grass tetany, etc. should be treated promptly as they occur. A good parasite control program includes fly control in the summer, a pour-on to control grubs and lice in the fall and winter, and worming as needed.

Pasture and Feed Production

The amount of feed you can raise and the number of cattle you can support on your farm depends on soil type plus management practices such as fertilization, grasses and legumes seeded, and rotational grazing. Your local extension agent can give you sound advice on these subjects.

Nutrition and Feeding

1. Cattle have four stomachs, whereas humans have only one. This allows the digestive system of cattle to convert grass and other forages into meat and milk. Humans cannot utilize forages, but we can use meat and milk to partially satisfy our nutritional requirements. Thus, land that has little use except to grow grass can generate human food by using cattle to convert the grass into meat and milk.

2. Cattle require energy, protein, vitamins, minerals, and water. The amount they need varies with age, size, body type, sex, rate of growth and fattening, stage of pregnancy, level of milk production and climate. A cow can meet her nutrient requirements under most conditions from pasture, hay, and mineral supplements, with little or no grain needed (see Fact Sheet 1300). Lower quality roughages often are adequate for meeting requirements during gestation, and good quality pasture, silage, or hay plus grain can be used to meet requirements from calving through re-breeding (see Figure 2). Growing-fattening cattle, however, must be

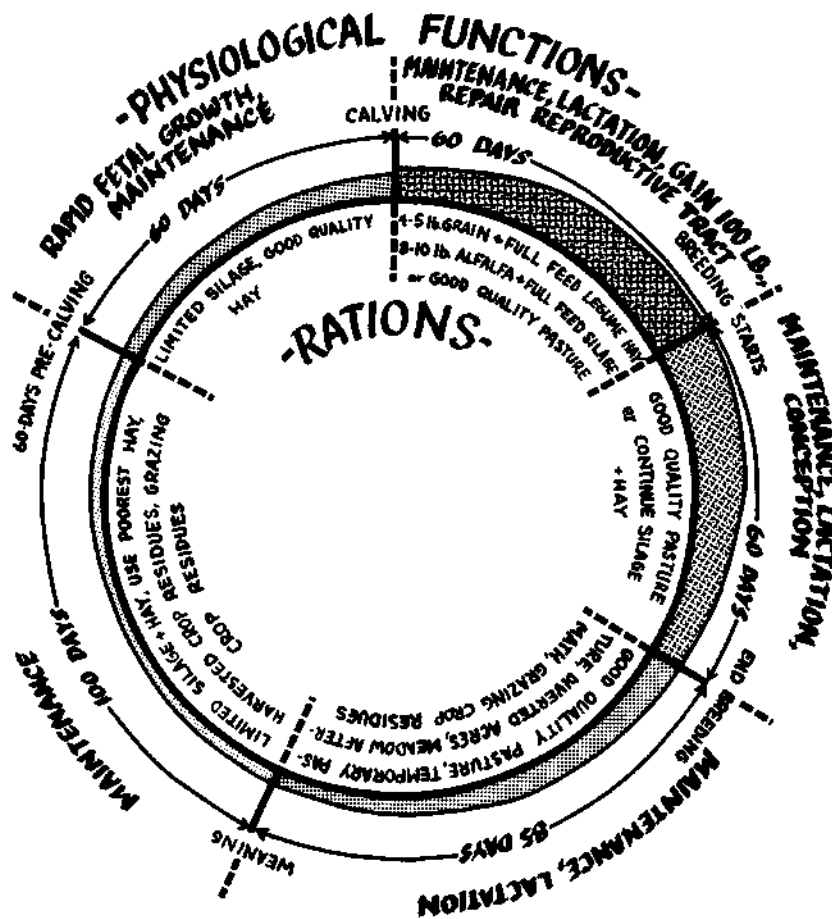


Figure 2. Beef cow reproductive and feeding cycle to obtain 1 calf per cow every 12 months.

fed some grain with forage in order to speed up their rate of growth and reduce the time needed to reach slaughter weight and finish.

When fed to appetite, cattle can be expected to consume 2 to 3 lb. of dry feed equivalent per 100 lb. of body weight per day. Determining the amount of each feed ingredient needed to meet specific nutrient requirements is called ration formulation.

3. It takes 2 to 2½ tons of hay to feed a beef cow for a 6-month period from late fall to spring when pasture is not available. From 0.5 to 3.0 acres are needed to produce this amount of hay. One to 5 acres of pasture are required for 6 months of grazing, depending on quality of the land, grasses and legumes used, fertilizer applied

and pasture management.

4. It takes about 1½ tons of grain and the equivalent of ¾ ton of dry hay to feed a calf from weaning (usually about 7 months of age) until a desirable slaughter weight of about 900 to 1,200 lb. for steers and 800 to 1,000 lb. for heifers. The time required depends on the proportion of roughage to grain in the ration, sex and type of cattle, environmental conditions and management practices used. The average slaughter age of calves in the United States ranges from 15 to 24 months.

5. When slaughtered at the above weights, about 60% of the live weight will be carcass, and approximately 70 to 75% of the carcass weight will be comprised of retail cuts of beef.

Reproduction

Puberty, Conception and Gestation

1. Beef cattle will mate and conceive at any time of the year, and whether or not they conceive depends on age, health, nutritional status, and number of days since calving.

2. An immature female will come into heat, produce eggs (ova), and be ready for breeding when she is about 15 months of age and/or 600 to 800 lb., depending on her breed and skeletal size. She can come in heat as early as 6 months, however, and should not be in with bulls after that time to avoid premature breeding. If bred too early, calving problems are likely to be encountered.

3. Bulls reach puberty at about the same age as females. Therefore, a bull may produce sperm and be able to breed a female at about 7-10 months of age, and should be separated from the non-pregnant females by this age. He can be used to breed 10 to 20 females at 15 months of age, 20 to 30 as a 2-year-old, and 30 to 40 thereafter.

4. Ovulation occurs about 10 hours after the end of heat. Following ovulation, the unfertilized egg has a life of about 6 to 10 hours. Sperm can survive for about 24 hours after being deposited in the female tract, but are incapable of fertilizing the egg for the first few hours. For maximum conception rate, the best time to artificially inseminate a cow is usually near the end of standing heat. If she is found in heat in the morning, breed her that evening; if she is found in heat in the evening, breed her the next morning.

5. A non-pregnant female will ovulate and show desire to mate (come in heat) about every 21 days. She stays in heat for approximately 12 to 24 hours.

6. Once she has conceived, a cow will calve 270 to 290 days later, depending on breed.

7. Most of the fetal growth in weight occurs the last 60 days before calving. Milk flow starts shortly before calving.

Symptoms of Calving

There are several symptoms of calving (parturition): a clear mucus discharge, the udder swelling as it fills with milk, and swelling of the vulva are early signs. Within 24 hours of birth, the muscles and ligaments will relax between the tailhead and pin bones, accompanied by an unusually large discharge of mucus (cervical seal). The cow usually shows little interest in feed at this time and normally isolates herself from the rest of the herd. Cows should deliver in a clean area, in a bedded pen or on clean sod, and in an area protected from wind. Try to avoid old, contaminated barn lots as they harbor scours.

Assistance at Calving Time

Once labor is started, a water bag appears. Then the birth process has begun—the front legs normally come first with the head resting on the front legs. When presented in this manner, the mature cow will usually not need help, but first-calf heifers or cows having abnormally large calves may require assistance. Studies show that as many as a third, or more, of the first-calf heifers need help at calving but only 3 to 5% of the mature cows require assistance when bred to average size bulls. If average size females (Angus, Hereford, Shorthorn) are bred to large type bulls, one-half, or more, of the heifers and about 10% of the mature cows need help. Birth will proceed in stages with the cow resting between stages. If there is no progress in delivery after 2 hours, get help from an experienced cattleman or veterinarian.

In pulling a calf, use a sash chord or obstetrical chains and pull down, not straight out, applying more pressure on one leg than the other to offset the calf's shoulders to reduce the shoulder area being forced through the pelvic region. Pull as she labors. Sometimes it is necessary to use a calf-pulling jack, which can be obtained through most livestock supply companies. These should be used only if necessary, and then with extreme care. If not used properly, then can severely injure the cow's reproductive tract. About 5% of the time, the calf will be presented in an abnormal position. The most common abnormal presentations are:

a. If only the calf's head or the head and one foot is visible, the calf must be pushed back into the uterus and both front legs with the head brought out together.

b. If the front feet protrude past the knees but the nose is not visible, the head is bent back and the calf must be pushed back into the uterus and the head brought forward with the legs.

c. If only the calf's rear legs and/or tail is visible, the calf is being born backwards. The calf must be pulled out as quickly as possible without damaging the cow. The head is at the bottom of the uterus, and when the breathing reflex is stimulated during passage through the pelvic region, the calf may drown in uterine fluids.

There are several other abnormal presentations that may occur, such as both front and hind legs forward, upside down, or upside down and backwards. Under these situations, you should get help from an experienced person or veterinarian if possible.

Procedures After Calving

After the calf is born, clean the nose and throat of all mucus, particularly if the cow does not take care of the calf immediately or if the birth has been abnormally long or difficult. The breathing reflex is stimulated by passage through the pelvis and dropping on the ground. If breathing does not start right away or is difficult, hold the calf up by its hind legs and shake it to clean out

the mucus. Slapping the calf on the sides or gently dropping it often helps. Dry the calf off in cold weather; once dry, it can stand a lot of cold.

Dip the navel in iodine and make sure the calf nurses as soon as possible. The first milk (colostrum) contains antibodies, which the calf can utilize only during the first few hours after birth. These protect the calf from diseases present in the environment the cow has been exposed to.

Watch for passage of the afterbirth following calving. It may be a sign of an infection if the afterbirth is retained or if a heavy discharge occurs a few days after calving.

Work cautiously with the cow at calving time and while the calf is young. She will tend to be more aggressive and protective of her calf at this time, but you can work with her if you move slowly and carefully.

This is a good time to put an identification tag in the calf's ear because a newborn calf is easy to catch and is not afraid of humans. They can be very difficult to catch after a few days of age. This is also an opportune time to give a vitamin A injection and anti-scours vaccine if needed. An injection of selenium and vitamin E may also be necessary if white muscle disease is a problem in your area.

Re-Breeding, Weaning and Longevity of Cows

1. The cow will come back in heat about 30 to 60 days after calving, depending on her nutritional and health status, and needs to be rebred within 80 to 90 days after calving to get a calf every 12 months.

2. The calf will reach 350 to 550 lb. by 7 months of age on milk from his mother plus the pasture or other

feed he may have consumed. Calves are usually weaned at about 7 months of age. After weaning, the cow's feed can be reduced to a near-maintenance level unless she is extremely thin.

3. The average beef cow remains productive until 7 to 8 years of age, but often is productive to 10 to 12 years of age. Some produce only one or two calves before becoming non-productive, however, and some may never breed because of infertility.

Economics

Annual costs of maintaining a commercial beef herd may range from \$100 to \$400 per cow unit, depending upon the area of the country and what types of expenses are charged against the cattle enterprise. For example, some producers may charge only their variable costs against the cattle. Others may include such fixed costs as depreciation on improvements, real estate taxes, land charges, etc. According to a recent USDA study, variable costs per cow unit in the eastern U.S. average about \$180, and total costs, excluding land, average approximately \$250.

Using the \$180 figure, in a herd with a weaning percentage of 85% and an average weaning weight of 400 lb., the necessary sale price of the calf crop to break even would be 53 cents per lb. For a herd with a weaning percentage of 90% and an average weaning weight of 500 lb., the necessary sale price would be 40 cents per lb. Using the \$250 figure, the break-even sale price for the two herds would be 73 cents and 55 cents, respectively.

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