

4-H BUCKET CALF PROJECT



**A Guide for Parents, Leaders
and 4-H Exhibitors**



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References and Sources:

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Kansas State Cooperative Extension 4-H Bucket Calf Project Parent and Leader's Manual, and the Oklahoma State Cooperative Extension 4-H Bucket Calf Guide.
Adapted from the Kansas Dairy Leaders Notebook.



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INTRODUCTION TO THE BUCKET CALF PROJECT

FREQUENTLY ASKED QUESTIONS (FAQ)

What is a bucket calf?

A bucket calf is an orphan or newborn calf normally purchased when they are 1 to 10 days old. However many calves are purchased at a month or even two months old. Many times the calf comes off of an old cow, or a cow that may have problems that dictates that the farmer sells her. The calves may be male or female, beef or dairy. The calves are usually started on a bottle with a nipple (or bucket and nipple) and eventually trained to drink from a bucket (therefore – bucket calf).

Where do I get a newborn calf?

Calves may be purchased off the farm from dairy or beef producers. Quite often, dairy producers will be able to tell you when they will have calves available. Dairies usually do not like to keep male calves, so they may be less expensive. Also, livestock auctions sell newborn to week-old calves. Do not wait until the last week or day to try and find a calf. Start making contacts well in advance. Contact your Extension Educator for more ideas.

What breed of calf should I get? Do I buy a male or female?

Breed and sex of the calf are of no importance in judging this project. But, you may want to consider long-term goals for each calf. Some questions you must answer are: Will I sell my calf after I show it at the county fair? Do I want to keep it and show it at future shows? Do I want to show beef (steers or heifers) or dairy (heifer)? Does my family have the resources (time and money) for a year around project?

How much does a newborn to week-old calf cost?

Prices vary depending on demand, health, breed, and location. Typically dairy breeds are more available and, therefore less expensive. Prices will vary from \$50 all the way up to \$500 in extreme situations. An average price should be \$150 unless there are other price factors. A good calf at a sale barn in April or May, could cost between \$200-\$300.

What is the most important thing to know when buying a calf?

Make sure the calf has had colostrum after being born. Colostrum is the first milk produced by cows at calving time. It is essential to the well-being of the newborn calf because colostrum contains antibodies, which are things that prevent certain diseases. Unless the calf receives 2 quarts of colostrum within the first few hours after being born, the calf will likely become sick and may die. At the time the calf is separated from its dam, an injection of vitamins A, D, and E is recommended. The recommended amounts are: 500,000 I.U. of A; 75,000 I.U. of D; and 50 I.U. of E. These vitamins will help give the newborn calf a good start in life. Read the segment in this document on "*Keeping Your Calf Healthy*" on page 11 for more information.

What equipment do I need?

You will need a place to keep your calf, calf bottle and nipple, a bucket for milk, halter, brush, water bucket, and feed pan. Some exhibitors may want to consider grooming and showing supplies.

What do I feed and how do I feed it?

You will start your calf on milk replacer, which may be purchased at most farm supply stores. Either a nipple bottle designed just for calves or bucket can be used for feeding milk replacer. Most farm supply stores will carry these supplies and will be happy to help you get started with your project. After 6 weeks or so you will wean your calf off of the milk and feed a calf starter ration along with good quality hay. For more information refer to the segment in this document on "*Feeding Your Calf*" on page 6.

How much space does a calf require?

Newborn calves can get sick real easy. Therefore, it is important to provide a clean environment for the newborn calf. Your calf will require shelter and a pen for protection from the weather and predators (dogs). A calf hutch and a small pen should only take up an 8x8 foot space. A plywood hut (3 sheets of plywood) and a 16 x 8 foot pen are sufficient for 2 bucket calves if you don't have a barn or other shelter. Calves should be housed separately in a clean, draft-free, dry environment to help keep it healthy. Good calf housing provides conditions that are comfortable for the calf and minimizes stress. Read the segment in this document on "*Housing for Your Calf*" on page 5 for more information.

Will my calf need shots or medicine?

Newborn calves can get sick real easy. Learn the signs of a sick calf and get to know your local veterinarian. Be sure that the navel is treated with iodine as soon as you get the calf and that you watch for navel infection. It is highly recommended that at the appropriate age your calf be vaccinated against IBR, BVD, Lepto, and Blackleg. Keep records of all medications given. Learn more about diseases and how to keep your calf healthy by reading the segment in this document on "*Keeping Your Calf Healthy*" on page 11 of this document.

What if I have more than one calf to feed?

House the calves in separate pens. This makes it easier to feed and prevents disease transmission. Identify each calf with an ear tag or neck strap with a name or number on it.

What other activities are involved?

Record keeping and awards: bucket calf exhibitors are encouraged to fill out a "Bucket Calf Record". One easy way to do this is to write on a calendar or in a diary, what you do each day with your calf. Then when you fill out your record form all the information you need is right there. Four-H members are recognized at the annual county achievement program for record books. Contact your Extension Educator or local leader for more information on records and awards.

Do I have to be Quality Assured?

All 4-H and FFA members that show meat animals need to be Youth Livestock Quality Assured in order to show their animals. Quality Assurance training are held by your local UNL Extension Staff or by a club leader, contact your extension office for dates and times. You will learn a lot about how to make your calf's environment, health and experience the best you can and help our producers protect consumers from unsafe foods.

BUCKET CALF PROJECT

THE BASICS

There several reasons for raising calves without their mothers. Occasionally, a cow dies giving birth or doesn't produce enough milk to support a growing calf. Some people buy calves to raise for beef and to use grass grown on a few acres. Some are bought to help control weeds on the farmstead. It also makes a great beginning 4-H or FFA beef project. Contact your local Extension Educator or FFA Advisor if this is of interest to you.

Purposes of the Bucket Calf Project

1. To design a beef project to fit the physical size, maturity and comfort level of younger or inexperienced youth.
2. To teach proper health care, nutritional requirements of young cattle insuring quality assurance.
3. To teach basic beef management skills without a large investment.
4. To teach basic record-keeping skills.
5. To provide a better understanding of the feeder cattle industry.
6. To give a young person a chance to interact, network and compete in a wholesome, useful venue.

Where to Buy Calves

It is best to buy calves at the farm whenever possible. However, you can buy calves through dealers that pick up calves at the farm and deliver them to you. Experienced dealers know how to care for calves in transit. Sale barns are the easiest markets for both the buyer and seller but can require extra care for the calves when you get them home. These calves are exposed to diseases and are under stress from being moved to and from the sale or auction. Care at the originating farm may have been less than desirable with calves sold through sale barns.

Shelter

Calves should be kept in separate pens that are disinfected and provide clean, dry, and draft free, shade and shelter. Pen space does not have to be that large. An 8'x 8' area is adequate for a calf hutch and pen. Read the segment in this document on "*Housing for Your Calf*" on page 5 for more information.

Feed

You will start your calf on milk replacer, which may be purchased at most farm supply stores. Follow mixing directions for the milk replacer. Read the segment in this document on "*Feeding Your Calf*" on page 6 to make sure your calf is nursing and getting adequate nutrition. This will help your calf maintain its built- in disease resistance. The next step is weaning, which is changing to dry feed, and this can be a stressful time for calves. Clean the bottle or bucket between every feeding and clean the feed trough daily when you switch to dry food. See the section on "*Weaning Your Calf*" on page 9.

Water

Calves should have access to clean fresh water daily. After you start providing dry feed (hay and calf starter), water should be available at all times. Clean the bucket and replace with fresh water every day.

Health Care

There are many things to know about keeping your calf healthy. Get to know your veterinarian. He/she is specialist in animal health care and should be an invaluable partner in any livestock enterprise. There are many activities that will require their expertise. For more information refer to the segment in this document on “*Keeping Your Calf Healthy*” on page 11.

Vaccinations

Calves need help in resisting diseases. Colostrum provides resistance for a time after birth, but as the calf gets older it needs to start developing resistance to disease on its own. Vaccinations help the calf by introducing a weakened or killed virus to its system. The weakened diseases are much easier for the calf’s immune system to fight and resist. Once the disease has been resisted the calf should be able to continue to fight the disease on its own. This is called immunity.

Recommended Vaccination Program

Calves — 2 months of age:

1. Clostridial bacterin (4-way)
2. IBR-PI3 nasal vaccine
3. 5-way Leptospira bacterin
4. Pasturella leukotoxoid

Calves — 4-6 months of age:

1. Booster clostridial
2. Modified live IBR-PI3-BVD
3. Booster Pasturella leukotoxoid
4. Brucella strain 19 – (heifers)

Contact your local veterinarian for help and advice with vaccinations.

Parasite Control

Flies, lice, ticks, and worms are all pests, which affect the health of your calf. Lice and ticks are small blood sucking skin irritants and may be controlled with sprays or pour-on chemicals. Worms are internal and may be treated with injectable, pour-on, or mouth application anthelmintics (worm killers). Spray for fly control on both the calf and in the pen.

Castration

This involves the neutering of male calves by removing their testicles. Castration can be done at any age; however, the younger a calf is the less stress on the animal. Bull calves are neutered because steers tend to have calmer dispositions and are easier to handle. Furthermore, consumers prefer meat from steers because of quality. Contact your veterinarian for help if needed.

Dehorning

Some breeds of cattle grow horns (and some do not), which have no practical use in most commercial beef cattle herds. An exception would be the Longhorn breed, which is prized for its horns. Calves should be dehorned early in life, preferably before two months of age, to decrease stress. Horned cattle can be dehorned by means of surgery, heat, or chemicals. Contact your veterinarian for help if needed.

HOUSING FOR YOUR CALF

Like all warm-blooded animals, dairy calves have only a very few basic requirements for normal growth and health--fresh water, proper food, and adequate shelter. A bucket calf's housing needs are simple, but it takes a truly concerned and "caring eye" to see that these simple needs are met. There is probably no other management program that varies more from one project to the next as much as calf housing.

Keep calves in individual pens until they reach weaning age. Separate pens prevent the calves from suckling one another and reduce the spread of calf disease. Housing calves individually allows you to watch the calf's daily feed intake and monitor it for diarrhea (also called scours).

Preferably arrange to use barns or pens that can be emptied completely for brief periods before starting more calves. After a calf is removed, clean and sanitize the entire pen to prepare for another calf.

A variety of housing systems work well, provided that each meets the following minimum requirements:

1. **Prevent direct contact among calves from birth to at least two weeks after weaning.** This reduces the risk of young calves transmitting diseases to each other. Although a few producers report success with "warm housing" (indoors) or with elevated slotted-floor stalls, the most popular method of housing for young calves is the individual calf hutch. Suitable calf hutches can be made on farm or purchased. Three major advantages of hutches are: (1) they are relatively inexpensive, (2) they are easy to clean and sanitize after each calf, and (3) they are easy to move to a new, clean location after each use.
2. **Provide shade from direct solar radiation.** It's not that the calf shouldn't have access to direct sunlight, but the calf must be allowed access to shade if needed. Heat-stressed calves will go off feed, become hyperthermic, and may even die. Outdoor calf pens must be partially covered and walled to prevent excessive heat caused by the sun and to guard against cold winter rains and wind. Pens open to the east gain warmth from the morning sun and provide shade during the warmer parts of the day. Rain seldom falls from the east. Hutches again work well for young calves up to 2 weeks after weaning. Be sure the hutches are well ventilated so that they don't become a miniature oven on hot humid days. Once older calves are grouped together, natural shade from trees or shade from properly managed shade structures (barn, shade netting, etc.) is adequate. Make sure there is enough square footage of shade for all calves. Check the shaded area frequently and prevent it from becoming a damp, manure-laden breeding ground for disease.
3. **Provide a clean, dry place for the calf to lie down.** Calf housing should be bedded to keep the calves comfortable and dry. Sawdust or straw is most commonly used. If the base under the bedding allows drainage, you can simply add bedding every few days to provide a dry bed for your calves. If the base is concrete or some other solid material, you need to remove the soiled, wet bedding at least weekly and replenish it with clean bedding. You may want to plan for an extra pen in this case to confine the calf while you clean its pen. Moist bedding harbors harmful bacteria and conducts heat away from the calf's body. The constant exposure to a large population of harmful bacteria will eventually overpower the calf's natural resistance and predispose the calf to disease. If a calf has no alternative but to lie on damp bedding, the bedding will conduct body heat away from her. This loss of body heat steals energy that the calf could have used for growth. Hutches are frequently bedded with straw, wood shavings, sand, or fine gravel. Older calves grouped on pasture will tend to find clean dry places to lie down, provided there are adequate shaded areas.

4. **Provide ventilation without being drafty.** Ventilation should provide fresh air at all times without drafts blowing directly on the calves. An ammonia smell indicates more fresh air is needed. Allow more air into the area through broad, continuous openings in the barn or hutch to prevent drafts. A young calf's respiratory system normally harbors potentially harmful bacteria, but the calf's natural defense system keeps them in check. Stagnant air traps bedding vapors that irritate the calf's respiratory system and weaken the young calf's natural defenses. This can lead to labored breathing, coughing, pneumonia, etc. Too much ventilation can lead to drafts that create problems for calves in cold weather. Too much air movement, especially under a calf in an elevated stall with mesh floor, can chill the calf and rob it of energy needed for growth. The design of most commercial hutches allows steady air movement without draft. A large part of success with calf hutches depends on proper orientation with slope of the land, path of the sun, and direction of the prevailing wind.

FEEDING YOUR CALF

Feeding a Newborn Calf

The first and most important feed given a newborn calf is colostrum. Make sure the calf has had colostrum after being born. Colostrum is the first milk produced by cows and is made by the dam for about 3 to 7 days after the mother gives birth. It is the calf's primary source of nutrition and fluids. It is essential to the well being of the newborn calf because colostrum contains essential antibodies that help the calf immediately fight off infectious diseases and nutritional deficiencies and gets your calf off to a good start. The antibodies in colostrum are absorbed through the cells of the intestinal lining and into the bloodstream where they can effectively fight off disease. From birth to 6 hours, nearly 100 percent of the available antibodies are absorbed from the gut. After 6 hours, the absorption rate declines significantly, and by 24 hours very little antibody is absorbed.

A calf needs 4 to 5 percent of its body weight in colostrum by the time it is 12 hours old and preferably within 1 to 2 hours. For an 85-pound calf, this means a minimum of 2 quarts (4 pints). If the calf does not get this colostrum it will likely become sick and may die. Each calf should receive 8 to 10 percent of its body weight, about one gallon, of colostrum in the first 24 hours. Feed it from a single, clean nipple bottle. Continue feeding colostrum to the newborn through the first 3 days if colostrum is available. Even though antibodies are not absorbed, they can still protect the gut locally, which helps resist infectious scours.

If the calf refuses to suckle, the colostrum can be delivered through an esophageal feeder. The esophageal feeder consists of an esophageal probe, tube, clamp, and collapsible fluid container. The probe is a semi-flexible tube, It has a tear-drop-shaped end designed for easy insertion into the esophagus but not into the trachea (windpipe). When feeding is over, slowly remove the tube. Clean and sanitize the feeder and allow it to drain and dry. This is sometimes called "tubing the calf" and may be the only way to feed a newborn calf. These slow-to-nurse calves should begin to drink or suckle normally in 3 or 4 days.

At the time the calf is separated from its mother, injections of vitamins A, D, and E are recommended. The recommended amounts are: 500,000 I.U. of A, 75,000 I.U. of D, and 50 I.U. of E. These vitamins will help give the newborn calf a good start in life.

Frozen Colostrums

The best substitute for natural mother's colostrum is colostrum from another cow. Periodically freezing high quality colostrum ensures that you have some available the next time it's needed for a newborn calf.

If you don't own a cow, colostrum may be available from a nearby dairy farm. Colostrum should be frozen in small amounts for fast freezing and easy handling. Be careful when you thaw frozen colostrum. Studies show that rapid defrosting using boiling water or in a microwave at a setting above 60 percent power destroys part of the protein antibodies. Two methods are recommended:

1. Warm water thaw where 1 or 2 quarts of colostrum are immersed in 110°F water and stirred every 5 minutes to assure even thawing and warming. Continue the process until colostrum reaches about 104°F.
2. Use a microwave oven set at no more than 60 percent power. Again agitate frequently to assure even thawing and warming. Stop when the colostrum reaches 104°F. Either process takes about 40 minutes.

Colostrum Supplements

During the past years, several colostrum substitutes have been promoted for use in calves. These products are not adequate substitutes for cow colostrum. They are meant to be supplements for calves that already have received some natural colostrum.

Bottle Feeding Your Calf

A calf will instinctively nurse its mother, but nursing a nipple bottle or drinking from a bucket is a new learning experience. Teaching a calf to suck from a nipple bottle is much easier than teaching one to drink from a bucket. A nipple bottle is convenient for measuring the correct amount of liquid feed.

The easiest way to teach your calf to consume milk or milk replacer is to take advantage of the calf's instincts. Since calves will instinctively nurse, insert one or two fingers in its mouth (yes, they have teeth, but only on the bottom) and let the calf start sucking. Then insert the nipple of the bottle in its mouth and let it continue to suck. If bucket feeding is used, force the calf's mouth into the bucket of milk while it is sucking on your fingers.

In addition to colostrum fed at birth, calves need milk for the first 3 to 4 weeks of life. After that, they can digest vegetable starches and sugars. Further milk feeding is nutritious but may be more costly than feeding cereal grains.

There is a tendency to feed the baby calf too much and the older calf too little. Whole milk or milk replacer should be fed at a rate of 8 to 10 percent of the calf's body weight for the first 4 weeks. For example, 10 percent of an 85-pound calf is 8.5 pounds or 1 gallon.

All liquids should be fed at room or body temperature. This allows the calf to more easily regulate its body temperature and makes drinking or suckling easier. While nipple bottles allow easier feeding with newborns, older calves easily learn to drink from a shallow bucket.

How Often to Feed

Calves are fairly adaptable to a variety of management practices; however, successful calf feeding programs should be as consistent as possible day to day. While calves are generally fed two equal feedings per day, weak calves benefit from more frequent feeding of the same total amount. Single daily feedings may increase the incidence of scours because of the high intake of total solids during a single, short meal.

Thoroughly clean any utensils used to feed calves. Milk residue, colostrum, or replacer is a great growing ground for disease-causing bacteria. Play it safe and ensure minimum exposure by thoroughly cleaning and sanitizing all utensils used after each feeding. Store equipment in a clean, dry place.

Milk Replacers

Newborn calves lack sufficient enzymes to use such non-milk foodstuffs as grains, sugars, vegetables, and forages. Therefore, good milk replacers are made from dried milk and milk byproducts such as skim milk, buttermilk or whey with animal or vegetable fats, antibiotics, vitamins, and minerals. Milk replacers can be fed as the only food source once colostrum has been provided. It may be fed along with a good calf starter as a combination or mixed ration.

Different milk replacers are available. Base your choice of milk replacers primarily on quality rather than price. Quality depends on the level and source of protein, fat, and carbohydrate. A good milk replacer will contain at least 22 percent protein and 15 percent fat. Because of the fat level, it is easier to mix when warm water is added. For most calves, 10 percent fat in the milk replacer is adequate. However, at 20 percent fat there is less diarrhea and faster growth in calves. Calves raised in cold environments grow better when fed replacers containing more fat (an energy source) during the winter months. Milk replacers should contain at least 20 percent protein when the protein is from milk products. When specially processed soy protein is used extensively, the protein level should be high (22 to 24 percent).

Milk replacer may be fed warm, but not above 100 °F. Mixing smaller amounts allows for easier mixing. Avoid changes in amounts or temperature of milk or replacer. Follow label instructions when using milk replacer. Holding the level of liquid feed constant encourages the calf to consume calf starter as its size and appetite increase. A calf needs 8 percent of its birth weight in milk or milk replacer a day. If a calf weighs 100 pounds at birth it should be fed 8 pounds of liquid in two equal feedings each day (Table 1). Likewise, a calf weighing 80 pounds should be fed about 6.5 pounds each day in two equal feedings (Table 1).

Table 1 – Milk Replacer Calculations

100 lbs X .08 = 8 lbs 8 lbs = 1 gal 1 gal = 4 quarts
So, feed 2 quarts per feeding, twice a day.

80 lbs X .08 = 6.4 lbs 8 lbs = 1 gal 1 gal = 4 quarts 1 quart = 2 lbs
So, feed approximately 1.75 quarts each feeding

Each calf should be fed from a separate nipple bottle or bucket to avoid spreading diseases from one calf to another. Calves raised separately do best. Separate pens will reduce disease transmission and make it easier to feed. Water should be made available for the calf even though it is being fed milk or milk replacer. It is best to offer water at least 20 minutes after feeding the liquid feed because water helps maintain the clotting enzyme (rennet), which is needed in the calf's stomach.

Milk replacers designed for calves more than 4 weeks old should not be used for younger calves. Carefully follow the label directions on the milk replacer bag.

Feeding Calves After They Are Started

Within a few days after the calf is born, it should be encouraged to consume dry feed, both calf starter and hay, to avoid upset stomachs and prevent nutritional scours. Dry feed consumption is necessary for the calf to develop a functional rumen. In the beginning, feed small amounts of calf starter and a grass or grass-legume hay. Hay quality is very important. Look for hay with green color, fine stems, and many leaves. It is important to keep the dry feed fresh, so do not feed more than the calf will clean up in a day. Once the calf starts eating dry feed, clean water should be made available at all times.

Calf Starters

The first dry feed offered to calves is called "starter." Starter is a very palatable, coarse textured or pelleted concentrate or grain mix. It should contain 75 to 80 percent total daily nutritional requirements and 15 to 20 percent crude protein.

Calf starters should either be coarsely ground, rolled, or pelleted. If the starter is ground too fine, palatability and feed intake go down. Coarse, dry feed promotes development of the calf's first stomach, called the rumen, and provides nutrients for growth.

A bucket is convenient for encouraging calves to consume calf starter (a dry feed, which can be put in the bucket as a calf finishes the milk replacer). Teach your calf to eat dry feed as soon as possible. Place a small amount in its mouth after each milk feeding or place a small amount in the feed box to encourage your calf to eat. About half a pint, or a quarter pound of grain, is all a small calf will eat each day. Increase the amount gradually as your calf is eating about 2 to 3 pounds of grain at 3 months of age and about 3 to 5 pounds of grain at 6 months of age (depending on the breed and condition of the calf).

Good calf starters contain adequate protein, vitamins, and minerals. You can purchase prepared calf starters from most feed dealers. Feed the starter according to recommendations on the container. A dairy cow grain mix with 16 percent protein is a good calf starter. It shouldn't contain protein or nitrogen from urea. Calves can't use urea until their rumen is completely developed.

Water is Important

Make clean, fresh water available at all times. To prevent the calf from drinking too much water at one time, put the water in a different container and location than you used for milk feeding

WEANING YOUR CALF

Weaning

Weaning – means changing the calf's diet from one composed mostly of milk (bottle feeding) to one that is all dry feed. It is not practical to feed milk or milk-replacer after calves are consuming enough dry feed to continue growing well. Calves can be weaned between 4 and 8 weeks of age. Wean calves when their starter intake is 1 1/2 to 2 pounds per day. In some cases, calves must be maintained longer on liquid feed because of low grain intake. As calves mature, lower or increase the amount of grain you feed them to meet the desired weight gain and the relative prices of grain and roughages. The change from a diet composed of milk and dry feed to one that is all dry feed can create some stress on your calf.

This is one reason why it is important for your calf to eat calf starter and hay at an early age, so it will be somewhat adjusted to dry feed. You can quit feeding milk as you wean as long as plenty of clean, fresh water is available. Calves receiving larger amounts of liquid feed can be gradually weaned to reduce trauma. In general, early weaning reduces feed and labor costs.

Calves should consume some high protein hay for at least a week before they are weaned. The growth and development of the rumen as well as the nutritional requirements of young calves depend mostly on grains but also on forages.

The key for determining when a calf can be weaned is the amount of calf starter it is eating. Calves can be weaned when they are consuming at least 1.5 pounds of calf starter per day. A simple starter diet is listed below (See Table 2). Calves should also be provided trace-mineralized salt at all times in a location out of the weather, especially if it is not provided in the feed ration. An alternative ration that makes ½ ton mix of feed is located at the end of this document (see Table 5).

Table 2. Calf Starter Diet

Corn, Cracked	52	pounds
Oats, Rolled	50	pounds
Soybean Meal	19.5	pounds
Molasses, Liquid	7.1	pounds
Limestone, Ground	1	pound
Trace Mineral Salt	.25	pound
Vitamin Supplement		
(Should supply 1000 I.U. of Vit A, and 140 I.U. of Vit E/lb of starter.)		

The amount of nutrients consumed is important to the recently weaned calf in order for it to continue growing well. Until the calf is about 3 months old, continue feeding all of the calf-starter your calf will eat, plus free choice hay. At that time, a less expensive grower mix could replace the more expensive calf starter (Table 3). An alternative calf grower ration (After 4 Months of Age) is located at the end of this document (see Table 6).

Table 3. Calf Grower Diet

Corn, Cracked	76	pounds
Soybean Meal	17	pounds
Molasses, Liquid	5	pounds
Limestone, Ground	1.2	pounds
Trace Mineral Salt	.3	pound
Dicalcium Phosphate	.3	pound
Salt	.2	pound
Vitamin Supplement		
Vitamin A	1000	IU/lb
Vitamin D	140	IU/lb
Vitamin E	20	IU/lb
Additives (Lasalocid and/or other Coccidiostat may be added)		

Weaning is a stressful experience for calves. You may notice that your calf may bawl for milk for a couple of days, especially near feeding time. Because the change of diet causes stress, the only thing you should do at weaning is to discontinue feeding its liquid portion of the diet.

Doing other things such as moving it to a group pen, dehorning, vaccinating, etc., can cause additional stress. Clean water along with clean, dry housing with protection from the elements will ease any stress problems.

Monitor Calf Growth

Check weight gains to determine if calves are growing at the desired rate. Periodically checking calf weight and height also helps you evaluate your feeding program. Also observe body condition and skeletal growth. Over-conditioned or fat calves may be receiving too much feed or the ration may be low in protein. Lack of condition or skinny calves indicates underfeeding or poor quality feed. If you don't have access to scales for weighing your calf, a weighing tape will estimate its weight accurately. You may be able to get a tape from your feed dealer or buy one from a farm store.

To estimate weight, place the tape around the calf's body directly behind the front legs (the heart girth). Make sure the calf is standing squarely on its feet. Have the tape fit firmly but not tight. Then read the weight directly from the tape. A guide to help you determine the on-going weight of your calf by this method is attached to the back of this guide.

KEEPING YOUR CALF HEALTHY

Preventing disease in the newborn calf gets them off to a good start, reduces death losses, and is cheaper than treating sick animals. Observe calves regularly, feed them correctly, and provide clean surroundings. Regular use of a rectal thermometer helps detect sick calves with fevers early. Normal body temperature is 101.5°F. Early detection is essential for effective treatment.

Seek advice from your local veterinarian in planning your disease prevention and treatment program. The veterinarian knows the diseases most prevalent in your area, appropriate vaccinations and will prescribe proper care and use of drugs. Your veterinarian may give advice by phone at minimal cost. Calf raisers should not vaccinate or treat calves without a veterinarian's guidance.

IS YOUR CALF SICK OR WELL?

What is normal?

If you think your calf is sick, it is a good idea to make the following checks before you call the veterinarian.

- **Respiration** (breathing rate) – Simply watch the animal breathe and count the number of breaths per minute. Normal breaths per minute for cattle range from 20 to 28.
- **Pulse** (heartbeat) – you can check the heartbeat by holding your ear against the lower left side of the calf's chest and listen to the beats. Or, you can feel the pulse with your fingers, by putting your finger on the artery that crosses the jawbone at the middle edge of the lower jaw. Normal heartbeats per minute for cattle range from 60 to 70.
- **Temperature** – For a small amount of money you can buy an animal rectal thermometer. Be sure and tie a string to the end of the thermometer to maintain control. Shake the mercury down below 98 degrees, and then insert it in the rectum. When the thermometer has been inside the calf for one to two minutes, pull it out and wipe it off with a paper towel or dry rag. Then read the temperature. Normal temperature is 101.5 degrees F. Be careful not to take these tests right after your calf has been excited or overheated. Also, outside temperature should be taken into consideration along with activity level.

Appearance and Behavior

One of the first things junior calf feeders need to learn is how to tell if calves are sick, or may be getting sick. Before you can tell if calves might be starting to get sick, you need to know how they act when well. One of the signs of well calves is eating. If calves start to eat less, or don't eat at all, this may be one of the first signs of sickness. Also, if calves are alert, stretch their backs when they get up, and are ruminating, then they're probably not sick.

Ruminating is a characteristic of animals with a complex digestive system called ruminants, such as cattle and sheep, but not swine or horses. Ruminants eat fast and then later "reprocess" the coarser parts of what they eat. They do this by regurgitating these parts back to the mouth, re-chewing and mixing with saliva, and, finally, re-swallowing. This is commonly referred to as "chewing the cud", and is a sign of a contented, relaxed, usually healthy animal. If you observe closely, you can see the physical signs of rumination.

If you'll watch your calves regularly, you'll better understand normal behavior. Then, if calves start to get sick, you'll recognize the early signs. But if you don't know how a healthy animal acts, you may not notice problems until a calf is very sick.

How does a sick calf look? What is not normal?

Now what are some of the signs of sick calves? Well, you've probably already guessed some of them from what we've already talked about. We'll first just list some symptoms and then talk about what might cause them:

1. Leaves some feed or quits eating entirely
2. Dull eyes, not alert, droopy ears
3. Diarrhea (scours)
4. Runny nose
5. Dry nose
6. Cough
7. Temperature
8. Swollen or puffy left side
9. Limping
10. Unusual skin conditions

As I've said before, if calves leave some feed they may be in the early stage of sickness. Or, it may just be that you're giving them more than they want to eat. Dull eyes, droopy ears, and general depression also may be early signs of problems to come.

Diarrhea, also called loose bowels or scours, is usually a sign of problems. There are several types of scours. Loose, bubbly scours without other signs may be due to feeding problems, especially too much high grain feed. Scours along with other symptoms may be due to some kind of infection. Scours with blood may be due to a particular infection called coccidiosis.

A runny or dry nose along with coughing is generally a sign of advanced sickness, often a respiratory infection (lungs, throat, nose). If you see these signs in calves, it is a good idea to take their temperature. To do this you need a rectal thermometer. Be sure to get the kind with a hole in one end so you can tie a string through the hole. This will prevent the thermometer from being drawn up inside the rectum, which could cause serious injury.

Don't be concerned if the temperature is a little higher than you might expect. Cattle have a higher normal temperature than people. The normal rectal temperature of cattle is between 101 and 102 degrees, and this may go up a degree or so for some animals, especially during the heat of the day in summer. If a human has a temperature this high, they're probably sick, since the normal temperature of humans is between 98 and 99 degrees.

Some experts consider 104 degrees to be the dividing line of a serious condition in cattle. Respiration rate also can be a guide. The normal rate in cattle is about 30 breaths per minute (one every two seconds), over twice as fast as humans. But this rate can vary a lot.

If calves look swelled or puffed up high on the left side just in front of the hip, this is due to a condition called bloat. Cattle ordinarily belch large amounts of gas during digestion. But various things can interfere with this normal loss of gas. Severely bloated calves can die quickly.

A sure sign of problems is limping. This may be due to injury, hooves trimmed too close, or infections such as foot rot. Swelling and heat just above the hoof are signs of foot rot.

Watch for various kinds of skin problems. Loss of hair may be caused by such things as ringworm, lice, or mange. Warts also can be a problem.

These are some of the more common signs of sickness or unusual health conditions in cattle. Again, study your calves closely every day and you'll be more aware of potential problems. It is a good idea to write down symptoms and conditions so when you talk to your parents, County Extension Educator, Ag Teacher, veterinarian, or other advisors they'll have a better idea of what might be wrong.

Once you determine that your calf is sick (if you have no previous experience with sick calves) call a veterinarian immediately. The quicker you involve someone with animal health expertise the better the chance your calf has of a quick recovery. Young calves get sick very easily and with a quick response and challenging the disease, you increase their chance of survival. Also, different diseases require different medicines for best results. Your veterinarian will be the most up to date on medication for specific infections. The following is probably the most common problem with bucket calves.

Calf Scours

One of the more devastating problems with young calves, scours may be caused by: bacteria, viruses, and nutritional or environmental factors. Diarrhea causes dehydration, a loss of water and minerals from the body. An irritation to the digestive tract caused by one of the above factors results in inefficient digestion of food. It is sometimes difficult to distinguish scours caused by infection organisms from scours caused by other factors such as overfeeding, irregular feeding, or rapid changes in feed. Infection scours usually affects several calves with foul smelling diarrhea, and some animals may die quickly.

Quick Treatment Necessary By far, the most important treatment for scours is replenishment of vital fluids and electrolytes. Numerous powdered formulas are available commercially that help return fluids into the calf that are lost in the diarrhea. You should keep a supply on hand to meet a scours problem. Consult your veterinarian for the best product and for the amount of mixture you need to give sick calves.

Scouring calves are usually losing body weight because of dehydration, and are unable to digest their food well enough to maintain or gain body weight. The greatest concern for a scouring calf should be to replace the loss of minerals and avoid body weight loss. Therefore, the immediate treatment should be to replace the lost minerals by feeding an electrolyte solution in addition to milk or milk replacer.

Effective electrolyte powders for mixing with water are available from your veterinarian. The electrolytes should be mixed according to instructions and fed 10 to 15 minutes after the milk or milk replacer. It is important not to feed the electrolyte solution immediately after the milk, since the solution will dilute the milk too much and will affect the digestive enzymes.

Since a scouring calf's digestive system is upset, the feeding schedule should be changed to avoid overloading the system. Milk or milk replacer should be fed at the rate of 1 percent of the calf's birth weight, but this total amount should be divided into four equal feedings. A good feeding schedule would be: morning, noon, evening, and bedtime. The same amount of electrolyte solution should be fed approximately 15 minutes after the milk. When the scouring condition begins to subside, the number of feedings can be reduced to three times per day and then two times per day. Finally, the use of the electrolyte solution can be withdrawn during a three-day period. For more information about calf scours, call or visit your local county office of the UNL Extension Service or your local veterinarian.

NOTE: The following page contains some other diseases and problems that you should be aware of when you raise any kind of beef.

Disease Terminology

Bangs (Brucellosis) Heifers kept for replacements must be vaccinated for this disease, at six months of age, which causes abortions in cattle. Nebraska is a Brucellosis free state.

Blackleg is a bacterial disease that can be picked up from spores in the soil. Signs include: swelling in neck, hip and shoulder, along with fever, lameness, and depression.

Bloat is a nutritional disorder that causes excess gas to be trapped in the rumen (stomach compartment). A visible swelling of the left side above the flank is the primary signal.

BVD (Bovine Viral Diarrhea) is a viral disease transmitted through contact. Clinical signs include: diarrhea, sores on lips and gums, lameness, and dry cough.

Clostridium Toxoids are bacteria (including Blackleg) that destroy tissue cells. Vaccination for control of these bacteria may be given (2-way to 8-way) for immunity. One of the most commonly used vaccines is 7-way plus Haemophilus.

Coccidiosis is transmitted in feed or water and is characterized by diarrhea, dehydration, loss of appetite, depression, and weakness. Keep pens and feed bunks clean and dry.

Diarrhea involves many aspects including nutrition, environment, and infectious agents. Fluid loss results in: dehydration, electrolyte imbalance, loss of appetite, coma, and death.

IBR (Infectious Bovine Rhinotracheitis), also called Red Nose, is a viral disease of the respiratory system. Clinical symptoms are elevated temperature and crusty nose.

Lepto (Leptospirosis) is a bacterial disease of animals and humans. Transmitted by contaminated feed or water it causes fever, bloody urine, loss of appetite, and anemia.

Pinkeye is caused by any number of irritants (weeds, flies) to the eye. The eye turns reddish and fluids drip from the corner. If left untreated, a white film eventually forms causing blindness.

Pneumonia is caused by any number of viral or bacterial agents. Shallow rapid breathing, listless appearance, and high temperatures characterize pneumonia.

Scours (diarrhea) cause extensive fluid loss and sudden death. Immediate treatment with an electrolyte solution will help prevent dehydration.

Ringworm causes unsightly patches on the skin. Ringworm is caused by microscopic molds or fungi and can easily be transmitted to people. Contact your veterinarian, 4-H Leader or Extension Educator for more ideas.

Warts are skin tumors caused by a virus that enters the skin through an abrasion in the head, neck, or shoulder area. Minor surgery or vaccines may be used to treat warts. Contact your veterinarian, 4-H Leader or Extension Educator for more ideas.



RECORDS

Keep good records of all events. One good way to do this is to write on a calendar or in a diary, what you do each day with your calf. Keeping track of all medicines that your calf receives is very important. Record the date, type of treatment, amount of medicine, who gave the medicine, kind of medicine, and any withdrawal date. This information will help your veterinarian determine if a different method of treatment is necessary.

COSTS INVOLVED – A BUDGET

Table 4 shows the approximate costs involved in raising a calf from birth to 17 months of age. As you can see, there is a lot involved in raising calves. General costs are listed in the table. There is the initial cost of the calf and additional costs in feed, housing, bedding, and medication. Costs vary from farm to farm.

Table 4: Example Costs for a Typical Bucket Calf Project (Per Calf)

<u>Age</u>	<u>Item</u>	<u>Amount</u>	<u>Costs</u>
Birth to 2 months			
	Milk Replacer	50 lbs.	\$ 34
	Calf Starter Grain	100 lbs	\$ 15
	Alfalfa Hay	30 lbs	\$ 2
	Veterinary Care and Medicine		\$ 10
	Buildings, Pens, Equipment		\$ 10
	Bedding (Straw, Wood Chips)		\$ 5
	Cost of Calf		\$150
	Death Loss	10 %	<u>\$ 15</u>
	Total Cost to 2 Months		\$241
3 to 17 Months			
	Grain Mix	1250 lbs @ \$185/ton	\$115
	Alfalfa Hay	3500 lbs @ \$ 75/ton	\$131
	Pasture	10 months @ \$12/mo	\$120
	Mineral and Salt		\$ 10
	Veterinary Care & Medicine		\$ 10
	Death Loss	2 %	<u>\$ 9</u>
	Total Cost 3-17 Months		<u>\$395</u>
	Total Cost 0-17 Months		<u>\$675</u>

If you sell your calf at 1200 lbs at \$65/cwt your income would be - **\$780**

You have a potential of making from your project a difference of - **\$105/calf**

Bucket Calf Management

“Rules of Thumb”

- 👍 Identify calf immediately after birth or after buying the calf. A 4-H or FFA tag should be used.
- 👍 Check calf for horn buttons. If you feel a bump on the poll you should dehorn the calf. An electric dehorner is the method of choice, however caustic potash or dehorning paste will work.
- 👍 Give your calf colostrums starting immediately after birth or at least the first three days of life.
- 👍 Do not overfeed or underfeed your calf. Weigh or measure the milk or starter feed each time.
- 👍 Feed milk once or twice daily at regular intervals. Warm milk to 100°F especially first 3 weeks.
- 👍 Use nipple bottle or pail to prevent calf from gulping milk and to reduce digestive upsets. Thoroughly wash and sterilize them when done. Calf diseases and bacteria can be passed from one calf to another by the nipple and from bottle.
- 👍 Always have fresh, clean water available in clean bucket or from an automatic waterer.
- 👍 Water should be in the front of the pen, opposite from the feed to prevent contamination.
- 👍 After calf is weaned, keep trace mineralized salt before it at all times
- 👍 Silage should be used sparingly as a feed for a calf that is under 6 months of age, and should not be used as the sole source of roughage after 6 months of age.
- 👍 Do not depend on pasture as a source of feed for a young calf, except under most favorable conditions. To often a calf is neglected and undernourished on poor pasture.
- 👍 Good pasture next to the barn or calf shed with shade and water can be a satisfactory supplemental feed and provide the calf with exercise and clean area to live and play.
- 👍 In mild weather, calves may be exercised out-of-doors, but exercise is not absolutely necessary for pre-weaning calves.
- 👍 After calf is weaned, it could be grouped according to age in a large pen with others. See that all calves actually eat their fair share or you may have to individually feed them.
- 👍 Observe groups of calves frequently for sucking of navels, ears, etc. You may have to remove calves that exhibit this behavior.
- 👍 When calves are unthrifty or have rough hair coat, check for external and internal parasites and treat accordingly. It may be best to treat the calf at weaning with an ivermectin product.
- 👍 Feeding antibiotics (terramycin or aureomycin) stimulates the growth of young calves and reduces the incidence of calf scours. Feed recommended levels (50-100 mg once-a-day) in the milk, starting with the first feeding. Antibiotics should be also contained in the calf starter ration (see table 3)

Alternative Calf Starter Ration (1/2 Ton Mix):

<u>Ingredients</u>	<u>Amounts</u>
Corn (Cracked) or Milo (Rolled)	400 lbs
Oats (Crimped or Course Ground)	200 lbs
Wheat Bran or Barley	100 lbs
Soybean Meal or Cottonseed	165 lbs
Dehydrated Alfalfa Pellets	70 lbs
Dicalcium Phosphate	10 lbs
Trace Mineralized Salt	5 lbs
Vitamin D Supplement	250,000 IU
Vitamin A (Stabilized)	2,500,000 IU
Aureomycin or Terramycin	15 gms
Liquid Molasses (If available)	50 lbs
Prairie Hay or Green Alfalfa	Free Choice

Alternative Calf Grower Ration (After 4 Months of Age)

<u>Ingredients</u>	<u>Amounts</u>
Corn (Cracked) or Milo (Rolled)	700 lbs
Soybean Meal or Cottonseed	100 lbs
Dicalcium Phosphate	7 lbs
Trace Mineralized Salt	7 lbs
Antibiotics	As Needed
Prairie Hay or Green Alfalfa	Free Choice



References:

Kansas State Cooperative Extension 4-H Bucket Calf Project Parent and Leader's Manual, and the Oklahoma State Cooperative Extension 4-H Bucket Calf Guide. Adapted from the Kansas Dairy Leaders Notebook.

Estimating Weight of Beef Cattle by Heart Girth Measurements

If it is not possible to scale weigh cattle, tape measuring is a handy alternative way to estimate weight. Remember that it only gives you an approximation of the animal's weight.

How to Measure Your Beef Cattle:

Stand the animal with head in normal position and with the four legs set squarely under the body. Pass the tape tightly around the body just back of the shoulders at the smallest circumference it is recommended that the animal be kept off feed and water for 12 hours before measuring. An overnight shrink is enough.

The Following Table Indicates Beef Cattle Weight in Relationship to Heart Girth:

Heart Girth Inches	Weight in Pounds	Heart Girth Inches	Weight in Pounds	Heart Girth Inches	Weight in Pounds	Heart Girth Inches	Weight in Pounds	Heart Girth Inches	Weight in Pounds
30	91	42	236	54	484	66	834	78	1288
30½	95	42½	244	54½	496	66½	850	78½	1310
31	99	43	253	55	509	67	869	79	1332
31½	103	43½	262	55½	522	67½	886	79½	1353
32	108	44	271	56	535	68	903	80	1374
32½	113	44½	279	56½	548	68½	921	80½	1396
33	118	45	288	57	562	69	939	81	1418
33½	123	45½	297	57½	575	69½	957	81½	1440
34	128	46	307	58	589	70	975	82	1463
34½	133	46½	317	58½	603	70½	993	82½	1485
35	139	47	327	59	618	71	1011	83	1508
35½	145	47½	337	59½	632	71½	1030	83½	1531
36	151	48	347	60	647	72	1049	84	1555
36½	157	48½	358	60½	661	72½	1068	84½	1578
37	163	49	369	61	676	73	1087	85	1601
37½	169	49½	379	61½	691	73½	1107	85½	1624
38	176	50	390	62	707	74	1127	86	1648
38½	183	50½	401	62½	722	74½	1147	86½	1672
39	190	51	412	63	737	75	1167	87	1697
39½	197	51½	424	63½	753	75½	1186	87½	1721
40	205	52	436	64	770	76	1205	88	1745
40	205	52	436	64	770	76	1205	88	1745
40½	212	52½	448	64½	786	76½	1226	88½	1770
41	220	53	460	65	802	77	1247	89	1796
41½	228	53½	472	65½	818	77½	1267	89½	1821

4-H BUCKET/BOTTLE CALF EXHIBIT

POSSIBLE QUESTIONS FOR INTERVIEW

1. Where and when did you obtain your calf?
2. Why was it for sale?
3. What did it cost you? Who paid for it?
4. How old was the calf when you got it?
5. How old is your calf now?
6. What did you name it? Why did you name him that?
7. Does your dad or mom have a name for this calf different than yours?
8. Did you have any health problems with the calf? Was it ever sick?
9. What did you do to help make him better?
10. How did you get him home?
11. What did you feed the calf when you first got him home?
12. Do you know what colostrum is? Did you feed it to your calf?
13. What was your feeding program for your calf?
14. What is milk replacer? Did you use any?
15. How long did you feed it milk? Are you still feeding it milk?
16. Did you warm up the milk? How did you do this?
17. When did you start giving your calf solid feed?
18. What did you feed it when you started the solid feed?
19. What are you feeding it now?
20. What feed does your calf like the best? How come?
21. How often did you change the ration?
22. Did you feed any antibiotics?
23. Where did you keep your calf? Did he have a special house or pen?
24. Did you have to get some special things for your calf? What were they?
25. Can you name some management programs that you used? ie—castrate, vaccinate, trimming, etc. How did you do this?
26. When did you start training your calf? Was it hard to do?
27. Do you plan to make a profit with your calf? How much?
28. What are you going to do with the money you earn?
29. What are you going to do with the calf after the fair? Why?
30. What did you like best about your bucket calf project?
31. What did you like the least about your bucket calf project?
32. What is the best thing about your calf that nobody else knows?
33. Did you like doing your record book? Why or Why not?
34. Do you suppose your parents like keeping records?
35. Would you do this again? Why or Why not?

NOTES:



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