Dairy Calves and Heifers
Their Care and Management

By

J. O. Tretsven, Dairy Specialist

Montana State College Agricultural Extension Service
CONTENTS

I. Feeding and Care of the Baby Calf ........................................... 3
   1. Attention at calving time ........................................... 3
   2. Care of the new born calf ........................................... 3
   3. Teaching the calf to drink ......................................... 4
   4. Kind of milk to feed ................................................ 4
   5. Amount of milk and frequency of feeding ........................ 5

II. Raising Calves on Skimmilk ................................................. 5
   1. Skimmilk feeding .................................................... 5
   2. Feeding Grain with skimmilk ..................................... 5
   3. Roughage for calves ............................................... 7
   4. Pasture for calves .................................................. 7
   5. Water, salt, minerals and vitamins ................................ 7

III. Raising Calves When Whole Milk Is Sold ................................ 8
   1. The nurse cow method ............................................. 8
   2. The limited whole milk method .................................. 8
   3. The use of calf meals ............................................ 9
   4. Raising calves on whey or buttermilk ......................... 10

IV. Care and Management of Calves ............................................ 10
   1. Housing ............................................................... 10
   2. Pens, stalls and stanchions ..................................... 10
   3. Dehorning ........................................................... 12
   4. Removing extra teats ............................................. 13
   5. Marking for identification ..................................... 13

V. Common Ailments of Calves .................................................. 14
   1. Common scours ..................................................... 14
   2. Pneumonia .......................................................... 14
   3. Ringworm ........................................................... 15
   4. Lice ................................................................. 15
   5. Vaccination ......................................................... 15

VI. Feeding and Management of Dairy Heifers ................................ 15
   1. Roughage and pasture for heifers ............................... 15
   2. Concentrates for heifers ....................................... 16
   3. Time of breeding ................................................. 16
   4. Handling the young heifer ..................................... 16
   5. Housing ............................................................ 16

VII. The Young Bull ............................................................... 17

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The development of a high producing herd of dairy cows depends largely upon how the animals are bred and raised. Good breeding and careful feeding go hand in hand. Improper feeding will dwarf a calf regardless of how well it may be bred. On the other hand, the most skillful feeder cannot develop high producing animals from calves out of scrub cows and by inferior sires. Assuming that the calf is well bred, then its ultimate value rests with the caretaker. Therefore, "any calf worth raising is worth raising well" is a good policy to follow.

THE DAM

Attention at Calving
The careful dairymen keeps a breeding record of his cows so that he knows when they will freshen. This enables him to give them a six to eight-week dry period in which to feed and condition for their next year's work. When the cow is due to freshen she should be kept in a large, clean well-bedded box stall, or out on a shady pasture lot, if weather permits.

As the time of calving approaches the udder becomes distended and the ligaments on either side of the tail head loosen, giving a sunken appearance to these parts. By observing these symptoms, experienced dairymen can tell quite accurately when their cows are going to calve. During labor the cow should not be disturbed, although it is best to keep watch of her in case she should require assistance.

If a weak calf is born and the cow is fretful, as is often the case with heifers, the calf may need assistance to nurse. Frequently one or more of the teats may become sealed with the milk serum. The attendant may prevent udder trouble and aid the calf if he cleans and examines the teats before the calf nurses.

THE BABY CALF

Care of the New Born Calf.
Leave the calf with its mother from one to two days. If the calf is weak or the cow's udder is caked and tender, as is often the case with first-calf heifers, leave the calf with the mother a day or two longer.

In weaning remove the calf to a clean, well-bedded pen while its mother is out of the barn. If separated at this time, so the cow and the calf cannot see nor hear each other, they soon quit worrying.
Teaching the Calf to Drink. Teaching a calf to drink is not difficult even though it has nursed for several days before weaning. No attempt should be made to get the calf to take milk within 12 to 16 hours after it is removed from its mother. Before milk is offered, the calf should be petted and handled gently to win its confidence. Remember that a frightened calf or one that is several days old is reluctant to suck the fingers. In case the calf refuses to suck the fingers after they are moistened in milk, it may be gently backed against the wall or into a corner and a small amount of milk poured from the edge of the pail into its mouth, which is held in an upright position. At the first taste of milk the hungry calf will become very anxious to obtain more food and will readily suck the fingers. While the calf sucks the fingers its nose may be brought down into the bucket, which is held by the other hand. (See Fig. 1). While the calf is sucking the milk, the fingers may be slowly removed from its mouth and left to rest on the nose. If the calf jerks its head up, the operation will have to be repeated.

Under no circumstances should the attendant try to force the calf to drink. If a little patience is used, the calf will generally drink alone at the end of the first or second lesson.

Kind of Milk To Feed. Feed the baby calf its mother's milk until it is five or six days old, then feed the herd milk. The milk should be sweet and of body temperature. For this reason, it is best to feed the calves immediately after the milk is drawn. Feeding cold milk in dirty, sour buckets is one of the common causes of indigestion or scours.
The amount of milk to feed should be governed by the frequency of feeding, the richness of the milk and the size of the calf. Strong, vigorous calves will thrive on twice a day feeding, while weak calves will do better if fed three times daily. By more frequent feeding a little more milk may be consumed and slightly faster gains obtained. Milk high in butterfat should be fed in slightly lesser amounts than milk low in butterfat. Many successful calf raisers advise diluting the milk from Jersey and Guernsey cows with 20 percent clean warm water before feeding.

As a rule, one pound of milk daily for each 10 pounds of live weight is sufficient for healthy, normal calves. The average birth weight of Jersey calves is about 55 pounds; Guernseys, 65 pounds; Ayrshires, 70 pounds; Holsteins, 90 pounds; and Brown Swiss nearly 100 pounds. This means that at first an average Jersey calf would receive five to five and one-half pounds of milk daily, while a Holstein calf would receive about nine pounds. The amount of milk is increased as the calves grow and develop. The amount of milk fed young calves should always be weighed or measured. Never guess. One pint of milk weighs approximately one pound.

**RAISING CALVES ON SKIM MILK**

**Skimmilk Feeding.** Very excellent calves can be raised on skimmilk, hay and grain if the right methods are employed. It is advisable to continue feeding the calf whole milk until it eats grain regularly and is in good, thrifty condition. By a little effort most calves can be taught to eat grain when they are four weeks old.

A change from whole milk to skimmilk should then be made gradually to avoid indigestion. By gradually substituting skimmilk for whole milk the change can be made in a week or 10 days without any check in the growth of the calf. As the animal increases in weight, the amount of skimmilk should also be increased until 14 to 20 pounds are fed daily to calves four to six months of age. It is advisable to continue feeding skimmilk until the calves are six months of age or older, provided the milk is available.

**Feeding Grain With Skimmilk.** Encourage calves to eat grain when they are two to three weeks old. This may be done by putting a small amount of grain into the calf’s mouth after milk is fed. Another way is to keep a small amount of fresh grain in a grain box or dish in a convenient
place in front of the calf. (See Fig. 2 for a convenient and sanitary arrangement for feeding grain to baby calves). Give skim-milk calves about all the grain they will clean up daily until they are about three months of age. After that, two and one-half to three and one-half pounds daily, depending upon the size of the calf and the quality of the roughage fed, is generally sufficient to insure good gains.

Skimmilk contains as much protein, milk sugar, calcium and phosphorus as whole milk. The principal nutrient removed by separating is butterfat, which also contains most of the vitamin A. Because skimmilk is low in fats, the grain ration fed with skim-

milk should consist largely of such common fattening feeds as cracked corn, rolled barley, ground wheat and oats.

While calves may learn to eat ground oats more quickly, whole oats have given equally good results. Many successful calf raisers feed whole oats only, as a supplement to skimmilk, legume hay or pasture. When the roughage consists largely of grass or
Roughage

For Calves.

Calves will start eating a little hay when they are a week to 10 days old. From then on fine, leafy, pea green hay should be before them at all times. A mixture of legumes and grasses gives splendid results. Choice alfalfa hay is also very good, although some dairy-men claim that it is too laxative when fed with skimmilk. Regardless of the kind of roughage used, the dairyman should be very particular in selecting the finest and brightest hay for the young calves.

It is a good plan to give the calves fresh hay every day. The coarser part of the hay that remains should then be removed from the racks or manger daily and fed to other livestock. Too often the hay racks are full of stems which have little value for calves.

A small amount of good silage may be fed after calves are four months old.

Pasture

For Calves.

Calves need no other roughage while on good pasture. Supplement short pastures with good, high quality hay. Experience teaches that skimmilk calves under 10 to 12 weeks of age will do better on good dry hay than on watery pasture grass early in the summer. Give young calves on pasture enough grain with their milk to insure good growth. While on pasture the calves need free access to water, and shelter to protect them from the hot sun and flies.

Water, Salt, Minerals and Vitamins.

Although calves are fed milk it is also necessary to supply them with clean water at least twice daily after they are a few weeks old. Feeding experiments have shown that calves take increasing amounts of water as they get older and that faster and more economical gains are made when they get plenty of water in addition to the milk.

Calves should have granulated iodized stock salt before them at all times.

When calves are fed the recommended amount of skimmilk, which is high in most essential minerals; legume hay, which is high in calcium (lime); and a grain ration composed of ground grain and mill feed, which is high in phosphorus, then there is little, if any, need of adding minerals to the ration. In cases where the ration may be deficient in calcium and phosphorus, then these minerals can be supplied efficiently and economically in the form of steamed bone meal. This may be placed in a box conveniently reached or may be mixed with the grain ration at the rate of one to two pounds for every 100 pounds of grain. In areas where
there is an iodine deficiency, calves frequently are born with enlarged throats. In such areas, feed iodized salt to the milking cows and the calves.

Calves fed on skimmilk, whole grains, pasture grasses or well cured, leafy, pea green hay and exposed to direct sunshine are not likely to suffer from a vitamin deficiency. In winter when calves are confined to the barn and are fed on skimmilk and low grade hay for long periods of time, they may suffer from a lack of vitamins A and D (the sunshine vitamin). In such cases one to two tablespoonsful of cod liver oil daily will help. Well cured, leafy pea green alfalfa hay is a very good source of vitamin A and will also provide some vitamin D. In winter during the warmer part of bright, sunny days the calves should have the run of a yard for an hour or more, depending upon the temperature.

When calves are fed the recommended amount of milk, high quality, leafy, pea green hay, and a good grain ration, and are exposed to direct sunshine, there is little, if any, need of adding high-priced protein feeds, mineral mixtures, vitamin products or condition powders to the ration, aside from what is mentioned in this circular.

WHEN WHOLE MILK IS SOLD

On farms where whole milk is sold at a good price and skimmilk is not available, some efficient, though economical method of raising the dairy calves must be adopted.

**The Nurse Cow Method.**

Raising dairy calves on nurse cows is practiced on a few farms in Montana. Cows that are difficult to milk are generally used for this purpose. While good calves can be raised by this method, the cost is high when the value of the milk or butterfat consumed is considered.

**Limited Whole Milk Method.**

When whole milk is sold, the calves may be raised on a limited amount of whole milk, provided they have choice, leafy, pea green hay and a well-balanced ration of grains and concentrates. The following system has been successfully used for several years by the Montana Agricultural Experiment Station. (See Montana Agricultural Experiment Station Circular No. 169, "Raising Dairy Calves on Dry Meal.")

The calves are fed the recommended amount of whole milk until they are six weeks old. After that the amount is gradually reduced so that milk feeding is discontinued by the time the calves are eight weeks old. Choice, leafy, pea green alfalfa or mixed hay is kept before the calves at all times except in summer when they are out on pasture. They also should have plenty of water.
When the calves are four weeks old they are encouraged to eat a meal such as the college has fed so successfully. This meal is mixed with a little ground oats or other feeding stuffs and placed in a container in front of the calves or in the bottom of the milk bucket. The calves will usually eat the meal readily when they are six to seven weeks old. The amount of meal is increased as the calves grow until 1.65 pounds meal and 1.35 pounds of other feed is consumed daily by the larger calves when four to six months of age. Meal feeding is continued until the calves are about six months of age. After that, hay, pasture, and the common feed grains are used. In winter the calves are exposed to the direct sunshine by turning them out into a protected lot for an hour or more during the warmer part of sunny days.

Following are three different meal mixtures:

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>No. I</th>
<th>No. II</th>
<th>No. III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dried Skimmilk</td>
<td>200</td>
<td>200</td>
<td>150</td>
</tr>
<tr>
<td>Dried Buttermilk</td>
<td>150</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Cracked Yellow Corn</td>
<td>215</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Steam Rolled Wheat</td>
<td>300</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Ground Wheat</td>
<td>150</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Dried Molasses Beet Pulp</td>
<td>35</td>
<td>35</td>
<td>100</td>
</tr>
<tr>
<td>Ground Oats</td>
<td>75</td>
<td>100</td>
<td>75</td>
</tr>
<tr>
<td>Soybean Meal</td>
<td>100</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>Linseed Oil Meal</td>
<td>35</td>
<td>25</td>
<td>35</td>
</tr>
<tr>
<td>Cottonseed Meal</td>
<td>25</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Blood Meal</td>
<td>50</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Bone Meal</td>
<td>15</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Granulated Iodized Salt</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Cod Liver Oil</td>
<td>1</td>
<td>100</td>
<td>1000</td>
</tr>
</tbody>
</table>

All three mixtures when fed as outlined above seemed to promote good gains at relatively low cost. In most cases the calves were above normal weight at two, four and six months of age.

**Use of Calf Meals.** Numerous commercial calf meals are now available. These are generally fed as a milk substitute after the calves are one to six weeks old, or as a supplement to the milk. Some of these meals are fed as a gruel while others are fed as a dry meal or in the form of pellets. In the feeding of commercial calf meals it is generally advisable to follow the recommendations of the manufacturer.
Raising Calves on Whey or Buttermilk.

Whey is often used as a substitute for skim-milk in cheese factory districts. Calves can be successfully raised on good, clean, sweet whey, hay and concentrates. However, whey that is allowed to ferment and putrefy in dirty tanks has little, if any, value for calves. Whey should always be pasteurized before it leaves the factory to avoid the spread of disease. In substituting whey for skimmilk it is advisable to continue whole milk feeding until the calves are in good condition and are four to six weeks old. Then whey may be substituted gradually for the whole milk, taking 10 to 14 days in making the change. The whey should be warmed to 90° to 100° F. before feeding.

Unlike skimmilk, whey is relatively low in protein and for that reason should be fed with a good grade of hay and a grain ration containing some protein-rich concentrates. The following mixture is an example:

- Ground barley or corn: 20%
- Ground oats: 40%
- Wheat bran or mill feed: 28%
- Linseed or soybean oil meal: 15%
- Bone meal: 1%
- Iodized stock salt: 1%

A good grade of buttermilk has about the same food value as skimmilk. However, because of the wide variation in the quality of buttermilk, it is advisable to delay buttermilk feeding until the calves have a good start and are five to six weeks old. Buttermilk should also be warmed to 90° to 100° F. before feeding young calves.

CARE AND MANAGEMENT

Housing. In winter young calves need the protection of a warm barn. Older calves six months and over, will do well in a well constructed shed if properly fed. 

Damp, stuffy, wet pens are not good for calves. Instead, the quarters should be ventilated, well lighted, clean and deeply bedded with dry straw. Drafty, dark, dirty, damp quarters may be the cause of unthrifty, sickly calves.

Pens, Stalls and Stanchions. Some dairymen provide individual pens (24 to 30 square feet) for baby calves until they are two to four weeks old. Then they are put into larger pens with other calves. By this system the calves are undisturbed by other animals, the caretaker can give them more individual attention and they are prevented from sucking one another. In the pens the calves have hay, grain or meal and water before them.

In place of the individual pens the Montana Agricultural Experiment Station has developed practical individual stalls for
DAIRY CALVES AND HEIFERS

young calves. (See Figs. 2 and 3.) The calves are tied by means of a light rope or chain snapped to a ring in a strap around their necks. Grain or meal is fed from a 10-inch porcelain mixing bowl fitted into a metal ring. The bowl is easily removed for cleaning. The calves stand on a grated wood platform which permits the urine to pass through, giving the calves a relatively dry bed of straw to lie on. The grated platform can be removed for cleaning. Hay and water are available at all times. In winter the calves are kept in these stalls until they are 6 to 12 weeks of age except for a short period each day when they are turned loose for exercise and sunning in a large pen or open lot when the weather permits.

Fig. 3

These stalls have the following advantages over the individual pens: (1) They require less space in the barn. (2) The calves learn to stand tied and are partially trained to lead when they are tied up. (3) Stalls take less bedding and are easier to clean. (4) Less material is required to build stalls. (5) Calves learn to eat.
grain at an earlier age because they have grain before them at all times in unsoiled containers.

After the calves are removed from the individual pens or stalls, they are grouped together in larger pens. The larger pens are equipped with stanchions for fastening each calf when milk is fed. Manger partitions between stanchions are necessary to prevent the calves from sucking one another and upsetting milk buckets. After milk feeding, the buckets are removed and concentrates are fed in the manger. After the calves start eating their grain, the stanchions may be opened. When calves take the grain into their mouths they soon lose the taste of milk and forget about sucking.

Dehorning. A herd of dairy cows will do better and be more easily managed if they have no horns. The simplest and most humane way to dehorn cattle is to apply a commercial dehorning paste to the horn button when the calf is three to ten days of age. Apply according to directions of the manufacturer.
Calves also may be dehorned with caustic potash (potassium hydroxide). This is done by removing the hair over the horn and rubbing the spot with a stick of moistened caustic. The very tip of the horn button is rubbed until the skin chafes, forming a spot about the size of a garden pea. As a rule one application is enough. However, a second treatment may be required until the operator gains experience.

The best way to handle caustic potash is to insert the pencil into a small rubber tube. Then it can be handled without burning the hands. It can be obtained at most drug stores. Fig. 5 shows how the operation is performed. Note the caustic pencil is held in a rubber tube. Fig. 6 shows removal of hair over the horn.

Removing Extra Teats. The extra or rudimentary teats that are often found on the udders should be removed when the calves are young. To remove these teats it is best to apply some disinfectant such as iodine and then snip them off with a pair of sharp scissors. A rubber band snapped tightly around the teat may also be used.

Marking for Identification. In large commercial herds calves are marked for identification. The best way of identifying grade calves is by means of numbered ear tags. Pure breeds are generally identified by means of tattooing in the ear, or color markings. As each heifer calf is born it should be ear tagged with the next consecutive number, which is recorded in the herd book. Many dairymen prefer numbering their cows instead of using names.

The ear tags should be inserted in the upper edge of the ear about one-third the distance from the head. In ear tagging young
calves, leave space for the ear to grow. Ear tags should be inserted so that the number is up, for easy reading.

COMMON CALF AILMENTS

Common Scours. Common calf scours, or diarrhea, is the most troublesome disease in raising calves by hand. The feeder always must be on guard to prevent this condition, as calves affected with digestive troubles frequently die or are seriously stunted and their final value reduced. Scours is generally due to improper feeding and mismanagement. The common causes are: (1) Too much milk at one time; (2) cold milk; (3) sudden changes in feeding; (4) sour milk in dirty buckets; (5) too much laxative feed such as wheat bran, linseed oil meal, legume hay and watery pasture grass; (6) wet and drafty pens; (7) spoiled feeding stuffs.

The first step in treating scours is to remove the cause. Reduce the milk ration one-fourth by substituting warm water and then gradually increasing the amount of milk again as the calf improves. This simple treatment is all that is necessary in most light cases if applied at the very beginning. With severe cases, in addition to the foregoing treatment, one and one-half to two and one-half ounces of castor oil should be given as a physic followed with one teaspoonful of a mixture of one part of salol to two parts of subnitrate of bismuth in the milk twice daily. An egg beaten into the milk is very beneficial for calves that have become weak from a long, severe attack of scours.

While such remedies are necessary when scours develop, it should be remembered that preventing the disease by good care and management is the key to success in raising calves.

Common scours should not be confused with white scours, a disease that is very infectious, affecting the calves shortly after birth. This disease seldom affects calves over a week old. White scours is characterized by light colored, offensive droppings and generally results in death within four days after birth. For treatment of this disease it is best to consult a veterinarian.

Pneumonia. Calves that have been weakend by scours or improper feeding and then are subjected to drafty, wet quarters or exposed to cold rains or snows, are very susceptible to pneumonia. Pneumonia is characterized by rapid breathing, coughing and high temperatures (105° to 106° F.) and a lack of appetite. Calves so affected should be blanketed and kept in a warm, dry, well-bedded place. They should be fed on whole milk and what choice, leafy, pea green hay they will consume. Fresh water should be before them at all times. In some cases a purgative of castor oil should be given.
Ringworms. Ringworms, which cause the white, scabby formations on the heads and necks of calves, mostly during the winter and spring months, can be cured by frequent applications of used crank case oil. It should be applied with a brush every day or two for a period of about 10 days. A light application of oil applied to feed racks, mangers and other places where the calves are likely to rub their heads and necks, will tend to prevent the spread of ringworm.

Lice. Calves infected with lice will not make economical gains and may be stunted enough to be unprofitable. The small gray louse can be destroyed easily by light applications of powdered sabadilla seed (poison) dusted lightly over the neck, back and head of the animal. It is applied with a large salt shaker when the animals are dry. Two or three light applications 10 days apart are sufficient.

The large blue louse can be destroyed by rubbing into the hair a light application of crank case oil or raw linseed oil.

Vaccination. By the time the calf is four months old it should be vaccinated against blackleg. If for any reason it seems best to vaccinate at an earlier age, the calf should be revaccinated six to eight months later. The heifer calves should be vaccinated also against Bang’s disease at any time between four and eight months of age. It is not advisable to vaccinate for blackleg and Bang’s disease at the same time. These are the only two diseases for which routine vaccination is advisable.

FEEDING AND MANAGEMENT OF HEIFERS

The dairymen should keep the heifer growing continuously until she becomes a cow. Any set-back that the young animal may have is likely to detract from its ultimate value as a producer. After milk feeding or the use of calf meals have been discontinued, the heifer should be fed liberally on roughage and enough grain to insure good gains.

Roughage and Pasture For Heifers. The most satisfactory hay to feed is alfalfa or clover, or mixed hay containing a large percentage of legumes. Both alfalfa and clover are rich in bone and tissue building material and are very palatable. It is a good plan to feed the heifers all the hay they will consume. Where silage is available it may be fed at the rate of 10 to 30 pounds daily, depending upon the size of the animal. During the summer when good pastures are available, the older heifers need no other feed. Younger heifers may need grain to insure rapid and satisfactory gains.
Concentrates For Heifers. The quantity of grain to feed will depend largely upon the condition of the animal and the kind of roughage. Provide enough grain to keep the animals growing steadily and rapidly unless this can be accomplished with cheaper feeds such as pasture grasses, hay and silage. It is not advisable to fatten the young dairy heifer, but keep her thrifty and growing continuously until a couple of months before freshening, when a higher physical condition is desirable.

The grains may consist largely of the home grown products, such as mixtures of chopped oats and corn. Oats and barley with legume hay also give good results. Cheap feed wheat may also be fed with oats. When the roughage consists largely of grass or cereal hays, then the addition of a small amount of oil meal or wheat bran to the grain ration may be advisable.

Time of Breeding. The time of breeding the dairy heifer depends largely upon her size and breed. Jersey or Guernseys of good size may be bred to drop their first calves when they are 24 to 26 months old. This means breeding them when 15 to 17 months. The larger breeds mature more slowly and under normal conditions require a growing period of one to two months longer. They should be bred when 16 to 19 months old. If the animals are undersize, it is a good plan to delay breeding a couple of months longer.

Handling the Young Heifer. It is a good plan to place the springing heifer in the milking stable a few weeks before freshening, so that she may be given special care and attention. She thus becomes accustomed to her stall, the clicking of the milking machines and the rumbling of the feed cart. Frequent petting or brushing and very gentle manipulation of her udder and teats will save much time and trouble in breaking her to milk.

A heifer never should be roughly handled. Such treatment not only invites trouble later but also results in lower production. Nervous, frightened animals never produce their maximum. For this reason dairymen should try to get their heifers as gentle as possible before freshening. Then if gentleness and patience are exercised when the heifer is first milked, the maximum production will be obtained and ultimately time saved. Properly handled heifers are easily broken to milk without the use of hock chains or other restraining devices. Kicking cows are nearly always the result of faulty management.

Housing. Dairy heifers six months and over will do well in a good, well bedded shed where they have water at least twice daily. A few days before the heifer freshens she should be kept in a deeply bedded
box stall unless the weather permits keeping her out on a grassy lot where she can be watched.

**THE YOUNG BULL**

Bull calves should be separated from the heifers at four or five months of age. The feeding of bull calves is not essentially different from that of heifers except that they grow faster and require a little more feed. Give the young bulls plenty of exercise as this is essential in the development of a strong, vigorous animal. While young they should be taught to lead and submit to handling. Scuffling and handling the bull’s head must never be tolerated as it encourages him to bunt and in time makes him dangerous.

When the bull is about one year old insert a ring in his nose. This can be done by punching a hole through the nasal division and inserting the ring by means of a cattle trocar and canula. Figures 7 to 12 show how this is done. A broken fork tine or other sharp instrument may be used instead of a trocar or canula. The bull should not be handled by the ring until his nose is healed.

It is a good plan to teach the bull to give his ring when the hand is stretched forward and the word “ring” is spoken. This is done by holding one hand out to receive the ring when the command is given and at the same time pulling his nose over to the outstretched hand by means of a rope fastened to the ring. By repeating this exercise a few times each day the animal will soon learn to give his ring. As the bull grows older it is safer to handle him with a strong staff.