Rearing Dairy Calves

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Rearing Dairy Calves

Abstract
To replace the aged and unproductive dairy cows in this country from five to seven million calves must be raised annually. Of this number probably more than one-third prove worthless at maturity because of their very limited performance at the pail. These calves are a financial loss both while they are being grown and later when they are milked, because they fail to produce enough for a profit and because the value of their carcasses for beef is below the cost of growing. With the upward trend in the price of feed it behooves the dairyman to consider seriously what heifer calves can be raised with profit.

Keywords
Animal Husbandry; Dairy Science

Disciplines
Agriculture | Dairy Science

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REARING DAIRY CALVES

The result of judicious mating

AGRICULTURAL EXPERIMENT STATION
IOWA STATE COLLEGE OF AGRICULTURE
AND MECHANIC ARTS

ANIMAL HUSBANDRY
Dairy Husbandry Section

Ames, Iowa
CALF CLAIMS

1. Select the sire and dam with utmost care.
2. Cleanliness is next to godliness.
3. Regularity promotes contentment.
4. Parsimony is not true economy.
6. Comfortable housing induces thrift.
7. Well shaded pasture is not objectionable.
8. Pure water and salt are not offensive.
9. Disease destroys dairying.
REARING DAIRY CALVES

BY L. S. GILLETTE, A. C. McCANDLISH, AND C. H. STANGE

To replace the aged and unproductive dairy cows in this country from five to seven million calves must be raised annually. Of this number probably more than one-third prove worthless at maturity because of their very limited performance at the pail. These calves are a financial loss both while they are being grown and later when they are milked, because they fail to produce enough for a profit and because the value of their carcases for beef is below the cost of growing. With the upward trend in the price of feed it behooves the dairyman to consider seriously what heifer calves can be raised with profit.

CALVES TO REAR

First and foremost, only those dairy calves by a pure bred dairy sire are worthy of retention and this does not include all grade calves by pure bred bulls. The ability of a good bull to increase the production of his daughters over their scrub dams has been generally accepted and is definitely pointed out in Bulletin No. 165 of the Iowa Agricultural Experiment Station. No progressive dairyman will take chances in raising a heifer calf for milk purposes whose sire is either a beef bull or a mongrel.

Further, only those calves from good producing cows should be raised. The conservation of dairy stock is a movement worthy of every praise, but no one should be misguided into growing out inferior heifers. Only the best high grades should be retained for dairy purposes.

EFFECT OF SIRE

The use of a well grown, vigorous bull from ancestry of known high production, as evidenced by semi-official tests for yearly periods, upon a grade herd will increase and thereby cheapen the cost of milk and butter-fat production of his progeny. Tests illustrating the effect of a pure bred sire have been conducted at this station. The results, presented in table I, show the average production of daughters and grand-daughters as compared to the original scrub cows upon which pure bred sires were used.

<table>
<thead>
<tr>
<th></th>
<th>Dams</th>
<th>Daughters</th>
<th>Grand-daughters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Milk lbs</td>
<td>Fat lbs</td>
<td>Milk lbs</td>
</tr>
<tr>
<td>Guernsey</td>
<td>4168</td>
<td>186</td>
<td>4634</td>
</tr>
<tr>
<td>Holstein</td>
<td>3255</td>
<td>161</td>
<td>6311</td>
</tr>
<tr>
<td>Jersey</td>
<td>3903</td>
<td>186</td>
<td>5400</td>
</tr>
<tr>
<td>Average of all</td>
<td>3791</td>
<td>178</td>
<td>5507</td>
</tr>
</tbody>
</table>
If this be calculated on the percentage basis it gives the percent increase of the first and second generations over their scrub dams, and grand-dams.

**TABLE II. PERCENTAGE INCREASE IN THE PRODUCTION OF DAUGHTERS AND GRAND-DAUGHTERS OVER THEIR SCRUB DAMS**

<table>
<thead>
<tr>
<th></th>
<th>First Generation</th>
<th>Second Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Milk</td>
<td>Fat</td>
</tr>
<tr>
<td>Guernsey</td>
<td>11</td>
<td>17</td>
</tr>
<tr>
<td>Holstein</td>
<td>94</td>
<td>62</td>
</tr>
<tr>
<td>Jersey</td>
<td>39</td>
<td>54</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>45</td>
<td>39</td>
</tr>
</tbody>
</table>

In other words, the production of this herd was doubled in two generations thru the use of good dairy sires, such as are not only within the reach of the average dairyman but also so cheap, relatively, that he can not afford to use a grade bull of any kind.

One of the most important factors affecting the size and strength of the calf at birth is the sire. The sire must not only be of good dairy breeding, but he should be well cared for during the breeding season. Running with the herd, a practice that begets weak calves and wears the bull out prematurely is too often permitted. To insure strong calves the bull should be kept separate from the cows, given plenty of exercise, fed a balanced ration and used judiciously. Where such methods are followed, large vigorous calves will be the result, and the problem of raising good calves much simplified.

The dairy sire is important not only in increasing production but also as a possible disease carrier. The sire should be purchased free from communicable diseases and kept in the same condition. Most important financially in the list of diseases is contagious abortion. To keep the bull free from this disease and thereby prevent his communicating it to the cows in the herd, the plan is followed at the Iowa State College dairy farm of disinfecting the bull both before and after service. For this purpose a solution of lysol, carbolic acid or any standard disinfecting medium has proved entirely satisfactory.

**CARE OF DAM**

The size and strength of the calf is vitally affected by the condition of the dam. The age and size of the dam, together with her feed and management, largely determine the nature of the offspring. Fully grown, mature cows will have larger and more rugged calves than heifers or even older cows that lack the scale and development sought. Altho the amount of nutrients required for building a fetus is so small that it can not be accurately measured, it is equally true that the care and feeding of the mother during this period are of the utmost importance. Unlike the breeder of beef cattle, the dairyman is not likely to have his cows too fat for producing large healthy calves.
Vigor, vitality, and the ability to transmit production characterize the pure bred sire.

This is due to the inborn tendency of a good dairy cow to produce milk rather than body fat and also to the fact that dairy cows when exhibited are shown only in good working condition. An excessively fat cow will ordinarily have a weaker calf than one in only average condition. This indicates the sort of care necessary in the case of the dam if the calves when dropped are to be large, vigorous and easily grown.

The plan followed of allowing the cow a resting period of from six to eight weeks previous to her freshening date, followed by the most successful dairymen, is commendable. It permits sufficient time to elapse for the cow to build up her own body and the developing fetus without affecting her milk production; in fact most cows will produce a larger quantity under these conditions than where they are milked continuously. During this period liberal pasture should be provided in the summer, while during the winter, silage and clover hay should be generously supplied. Where cows have milked down, it is desirable to supplement this allowance with a small amount of grain. For this purpose probably no other feed is superior to a mixture of ground oats, old process linseed oil meal and wheat bran. These feeds have a cooling, laxative effect upon the digestive tract and with the clover hay provide the ash and protein required for the growing fetus. The grain allowance should be reduced about
ten days or two weeks before freshening, while in the week im-
mediately preceding freshening only a very small amount of
grain, if any, should be fed.

If the cow is in a thriving condition and has had time to re-
cuperate after having been dried off, little trouble should be
experienced at calving time. A short time before she is due, she
should be placed in the quarters she will occupy at parturition
in order that she may become accustomed to her surroundings.
A large sized box stall or a pasture free from other stock, de-
pending on the season, is probably the most suitable place. The
stall should be comfortable, light, well ventilated and sanitary. A
calf dropped in such quarters will be less liable to debility and
disease.

If the ration suggested above is still being fed in limited
amounts along with silage and alfalfa, there will be much less
danger of constipation. If the pregnant cow shows any signs
of constipation three-quarters to one pound of Epsom salts or
one quart of raw linseed oil will prove very beneficial. The cow
should be kept in a laxative and thriving condition for she will
then be more apt to come thru this critical period in condition
to produce large quantities of milk.

During the calving period the water supplied should be luke
warm. This not only takes part of the strain off the animal

The constitution, capacity, and producing ability of the dam are trans-
mittted to the progeny.
body but also tends to make retention of after-birth less likely. It also affords the cow opportunity to recuperate quickly and to be placed upon feed in a short time. The only grain recommended at this period is a warm bran mash. After the cow begins to gain, the grain ration may be gradually increased, but it should be composed of the more desirable feeds until the cow is in normal thrift. The grain ration for the first week should not be over seven pounds, the usual practice being to increase the grain ration at the rate of half a pound every other day. This increase may continue as long as the cow profitably increases her milk flow. The cow will respond as well to half a pound increase as to a pound, indicating that the smaller increase is preferable. When her maximum flow has been reached, the feed may be lessened in a similar manner until the balance of profit is reached.

CARE DURING CALVING

The most critical period in the calf’s life occurs during calving. Careful and prompt attention at this time, especially when the cow exhibits difficulty in calving, will save the life of the calf as well as conserve the vitality of the mother. If the calf’s respiratory system does not begin functioning promptly when the circulation through the navel string is stopped, some means must be adopted to induce breathing. Cleansing the nostrils of obstructive membranes is helpful, while slapping the chest with the palm of the hand or with a towel dipped in cold water, or alternate compression and relaxation of the chest may be effective in extreme cases.

To prevent navel infection and subsequent complications, the calf’s umbilical cord should be thoroly disinfected immediately after birth. For this purpose an iodine solution or a lotion of carbolic acid may be used, after which the navel should be dusted with alum powder. This also prevents white scours, a highly contagious and usually fatal disease of newborn calves.

It is the practice at the College dairy farm to allow calves to remain with their dams for two or three days. This permits the calf to nurse the dam and thus secure the colostrum, or new milk which is high in albumen and ash and is so essential to stimulate the action of the digestive tract. This practice also permits the calf to feed as often as desired and has a beneficial effect upon the condition of the udder. For these reasons it appears advantageous for the calf and the dam to remain together for this period, so critically important in the lives of both.

TEACHING TO DRINK

One of the decisive periods in the calf’s life is when it is being taught to drink. If the calf is taken from its dam soon after
it is dropped it will as a rule quickly learn to drink, but as it
is not usually advisable to practice such early weaning, difficulty
is sometimes experienced in getting calves to take to the bucket.
When the calf is to receive its first lesson in drinking it should
be hungry as it is then a more apt pupil. Only a little warm
milk in a clean bucket should be offered and often a few min-
utes coaxing will be all that is required to get the calf to drink.
Even if it drinks well, however, only a little milk should be
given at each meal so that it will be hungry and ready to drink
at the next feed. When the calf is backward at drinking a good
method is to get it in a corner so that it can not back away, and
put one or two fingers in its mouth. It will suck the fingers, and
while it is doing this, lower its head gradually until the hand is
in the milk. The calf will then suck up some of the milk and
when it has done this for a little time gradually remove the
fingers. As a rule the calf will, after a few such trials, learn
to drink alone. If neither of these methods is successful the
feeder should back the calf up in a corner, get its neck between
his legs and put its head down into the bucket and hold it there
to force the calf to drink. In addition to keeping it hungry and
ready for meals, the main aids to success in teaching a calf to
drink are patience, perseverance and practice.

WHOLE MILK PERIOD

Success in feeding young calves is based on a few fundamen-
tals. The milk, whether whole or separated, should be fed as
soon after milking as possible so that it will still be warm. The
buckets used must always be washed and rinsed out after each
feeding, scalded regularly and aired in a sunlit place; not thrown
unwashed into a corner of the calf pen. Cleanliness is as es-
sential in the calf’s feed pail as it is in the milk bucket. The
feeding should be regular in time and amounts; feeding at ir-
regular hours or in undetermined or irregular quantities always
tends to create digestive troubles and unthrifty calves. Feeding
should always be guided by the milk scales or quart measure
and increases in the ration should be brought about gradually.
The calf should be kept hungry rather than overfed as over-
feeding causes digestive troubles while calves that are ready for
their meals are as a rule thrifty.

When the calf is two or three days old he can be taken away
from the dam and fed fresh, warm whole milk at the rate of six
to twelve pounds per day, depending on the size and vigor of the
calf. The feeding should be done three times a day until the
calf is about three weeks old. At that time the number of feeds
can be reduced to two per day, and the substituting of skim
milk for whole milk may begin.
SKIM-MILK PERIOD

This substitution must take place slowly and may be completed when the calf is about six weeks old. At this age the amount of skim milk required will vary from 12 to 16 pounds per day. When on full feed 16 to 18 pounds of skim milk per day will as a rule be sufficient for a calf. While skim milk feeding should continue until the calf is seven or eight months of age, many calves are successfully reared tho entirely weaned when four months of age. The additional allowance of skim milk, however, keeps the calf in a thriving condition, sustains rapid growth, and promotes true economy in the production of high class dairy stock.

MILK SUPPLEMENTS AND SUBSTITUTES

A milk supplement is usually a concentrate allowance fed along with skim milk to replace the butter-fat of the milk, while a substitute is something fed in place of milk when the latter is unavailable. These are necessary because it is too expensive to raise calves on whole milk and in some market milk sections even skim milk is scarce.

Where skim milk is available no supplement other than some of the grain rations subsequently outlined are needed but where
even skim milk is not available, some substitute must be found. There are many supplements and substitutes on the market in the form of proprietary calf meals and though some of these are excellent feeds, others are not, and many of the good ones are too high priced to be adapted for the dairy farmer.

Where milk substitutes must be used it is probably best to wait until the calves are six or eight weeks old and then substitute them gradually. The gradual substitution occurs in a manner similar to that used in replacing whole milk with skim milk. The following substitutes give good results and can be made at home much more economically than substitutes can be purchased.

**Recommended by Pennsylvania Experiment Station.**

- Wheat flour 30 lbs.
- Cocoanut meal 25 lbs.
- Skim milk powder 20 lbs.
- Oil meal 10 lbs.
- Dried blood 2 lbs.

**Recommended by Indiana Experiment Station.**

- Equal parts of Oil meal
- Hominy feed
- Red dog flour
- Dried blood

It is recommended that the first mixture be fed as one pound in six pounds of water and at the rate of two pounds of the mixture per day for calves about six weeks old and increased gradually as the calves grow. The other mixture should be fed at the rate of one pound to eight pounds of water and one pound of the mixture per day for a calf six weeks old.

**MISCELLANEOUS FEEDS**

**Grain.** Young calves readily learn to consume grain and it should be put before them about the time the substituting of the skim milk is started. A practical way is to feed the grain just after they have had their milk as this tends to prevent them from sucking each other. A good concentrate allowance consists of materials that provide plenty of muscle and bone building nutrients—protein and ash—and also contains a fair amount of fat to replace some of that abstracted from the milk. Corn, bran, oats and oil meal are excellent grains for calves and the following are suitable mixtures:

1. Corn 3 parts, bran 3 parts, oats 3 parts, oil meal 1 part.
2. Corn 5 parts, oats or bran 3 parts, oil meal 1 part.
3. Oats 3 parts, bran 1 part, oil meal 1 part.

At first the corn should be fed cracked but later the calves can profitably handle whole corn, and oats may be treated in the same way. Sometimes it is economical to use hominy instead of corn. Oil meal, though frequently expensive, is an excellent addition, in small quantities, to the calf's ration as it has valuable laxative properties and also tends to keep the calves in good condition and sleek.
Through skillful feeding and careful management the well-bred individual becomes a profitable producer.

Grain should not be left in front of the calves all the time as it becomes stale. They should have just what they can clean up—not more than half a pound per head per day up to eight or ten weeks of age, and from this until weaning time a pound per day will be sufficient under average conditions.

Hay. The feeding of hay should begin about the same time as the feeding of grain and hay can be kept in front of the calves from this time on. Alfalfa hay should not be fed to very young calves as its high protein and ash contents tend to cause urinary and bowel troubles. For young calves, red clover or mixed hay is probably the best, although clover hay is highly recommended for young animals.

Silage. Silage should not be fed to young calves; if fed at all to those under weaning age it should be in very limited quantities. Care must also be taken that only the fine particles, excluding cobs and stalks, are fed and that the material is taken direct from the silo and not allowed to lie in the manger until spoiled. Unless these points are duly considered digestive troubles will result.

Roots. Where roots are available they can be used to advantage in calf feeding. They should be cut and never fed in quantities larger than the calves will clean up in a short time.

Pasture. Fall and winter calves that have been properly tended can advantageously be allowed access to pasture in late
spring or early summer but spring calves should not be put to pasture under three months of age, unless under exceptionally favorable conditions. Heat and flies are the two great enemies of young calves and these can as a rule be better warded off in the barn than outside. For older calves, however, pasture provides an excellent succulent roughage and in addition the calves secure plenty of fresh air and exercise. The calf pasture need not be very large but it should be provided with plenty of shade.

**Water and Salt.** Water is essential even to calves on a milk diet, and they should have an opportunity at least once a day of getting all the fresh water they desire. Stagnant water in the barnyard or in ponds to which the calves have free access may induce serious intestinal disturbances and cause general poisonous effects. Salt should also be provided ad libitum as soon as the animals are old enough to consume hay and grain.

**THE GROWING HEIFER**

Many calves are well tended, and kept in good condition until weaning time, but after that they are neglected. Weaning should be gradual, from three or four days to a week being required for the operation.

If fall calves have been properly treated during the winter it is not difficult to carry them through their first summer. After weaning they should be on pasture as much as possible and in addition receive a little grain. The grain ration can be very similar to those recommended for younger calves but the corn and oats should be increased at the expense of the bran and oil meal. The pasture should have plenty of shade.

During the following winter, when the heifers are about a year old, the feeding should be liberal in order to keep the animals in good growing condition as the main object in feeding dairy heifers is to produce animals with plenty of constitution and capacity. The feed should be bulky and at the same time contain plenty of protein and ash. The protein and ash aid in the building of muscle and bone and bulky feeds distend and develop the digestive organs. Alfalfa and clover hay are the best dry roughages to feed to dairy heifers at this stage and silage is useful in limited amounts. Where silage is available, 15 to 20 pounds per day may be fed to dairy heifers during the winter and this with 7 or 8 pounds of legume hay and 2 to 3 pounds of grain makes an excellent ration. Where silage is not available the allowance of hay can be doubled and another pound or so of grain fed. The grain ration may be very similar to that used in the earlier stages but the proportions of carbohydrate feeds such as corn and oats should be increased.

During the following summer the heifers will need little but pasture until fall when the treatment may be similar to that of
the previous season up to the time it is necessary to prepare them for their first freshening.

Spring or summer calves are not so easily cared for during their first winter as are fall calves but should be similarly fed, altho the amount of silage used must be limited and additional grain supplied.

**HOUSING**

The calf barn should be well lighted, and airy, but not subject to draughts. Whenever possible it should be closed off from the main barn as even under the best of conditions the odors of the calf barn may be pronounced and it is not desirable that they should find their way into the milking stable.

Individual pens are advocated by some pure bred breeders but they increase the labor of cleaning and feeding roughages. They prevent the calves from sucking each other and may help control the spread of disease, they do not allow of the calves getting plenty of room for exercise and they add to the expense of construction. The pens should be provided with small stanchions which facilitate feeding and also prevent the calves from sucking. These should be provided with suitable mangers for the feeding of grain and a hay rack should also be included. Hay should not be thrown on the floor as it is soon fouled. The pens ought to be warmly bedded with straw or shavings and cleaned out regularly and disinfected.

After weaning time heifers should be on pasture during the summer and in winter the most economical method of handling them is to give them a good run and a well sheltered warm shed for protection. This tends to prevent disease and promote healthy vigorous growth and in addition it is cheap. Where animals are to receive special care or are to be forced they must be more closely confined but this is expensive and impractical on the average Iowa farm.

**DEHORNING**

Cows with horns can inflict severe damage on each other and bring about considerable loss to the farmer in the way of injured udders and lost calves. The lack of horns may, in the opinion of some, detract from the appearance of a herd, but in spite of this it will be of great advantage in many cases to have the herd dehorned. The easiest and most humane way is to begin with the calves. The most satisfactory method of dehorning calves is to use caustic potash before the calf is a week old. The horns are then apparent as small prominences covered with hair. The hair should be clipped from these and then the moistened stick of caustic potash rubbed on the skin over these points until the surface is red but not bleeding. The caustic potash stick should be wrapped in paper and not handled with the bare
hand. Too much moisture will cause the potash to run over parts where application is not necessary and cause unnecessary pain and it may even get into the eyes of the calf and cause blindness.

MARKING CALVES

A good herdsman knows his animals but for safety and as an aid in keeping a record of the herd, all animals should be numbered. Among the systems of numbering animals are the following:

1. Branding which is not favored in dairy herds owing to the pain and disfigurement ensuing.
2. Notching the ears which should be discarded for the same reasons.
3. Burning the numbers on the hoofs or horns. Numbers on the hoofs are not easily visible and they can not be applied on the horns when the animals are young and the numbers most needed. They also wear off and need renewal.
4. The use of ear tags has the great advantage of being simple and the numbers are comparatively easy to read but they are apt to be torn out and so not only is the record of the animal’s number lost but the ear is also disfigured.
5. The number of the animal is frequently tattooed on the inside of the ear. This method is simple but it is difficult to read at times and unless the work has been carefully done and good ink used the numbers will disappear. In addition it can not be used with black and white animals as the red inks on the market are unsatisfactory.
6. Neck straps with numbers attached can be used. These are fairly good tho they are sometimes broken.

No one system of marking calves has proved entirely satisfactory and probably the best method in vogue at present is a combination of the last two outlined.

DISEASES OF CALVES

Calves, especially in the early stages of their development, are subject to a few common diseases. Some of these diseases are accompanied by high mortality, while others, tho not responsible for the deaths of so many calves, undoubtedly lead to a considerable amount of unthriftness on the part of calves and consequently to a considerable financial loss to the farmer.

Prevention is undoubtedly the best treatment for calf troubles and with careful feeding and management considerably less trouble should be experienced with the more common calf diseases. When disease does make its appearance, “cure alls” should be carefully avoided and if the trouble can not be treated successfully a competent veterinarian should be called. The following suggestions, whose value has been proven by practical experience, are offered.

Constipation. (Retention of meconium.) The newly born calf requires the colostrum, or first milk, of its dam to assist in getting the bowels into good working order. Occasionally when the calf fails to receive the colostrum, the bowels remain inactive and the meconium is retained. Enemas consisting of a watery solution of soda or one half teaspoonful of salt in one quart of water injected with a syringe or allowed to gravitate in thru a hose and funnel, (or an ordinary fountain syringe) relieve this condition. Soap and other irritants should be avoided. In older calves constipation is occasioned by improper feeding, such as lack of sufficient roughages. One of the safest treatments for constipation is the administration of castor oil in doses of one to three ounces depending on the size and age of the calf.

Indigestion. Digestive derangements in calves may be due to a variety of causes. Among the more common are constipation, over-feeding, irregularity of feeding, feeding dirty milk or other feeds that are in bad condition, too rapid changes in feeds, or chills brought on by draughts or by damp, cold floors. The cause of the trouble should be immediately located
and remedied and in addition the feed should be cut down and castor oil administered. Where abnormal fermentations due to dirty milk are the cause of the trouble, lime water may also be of value.

**Bloat.** This form of indigestion may be caused by abnormal fermentation in the stomach brought about by dirty milk and also by the calves sucking each other and thus drawing air into the stomach, and also the calves swallowing the foam which is sometimes found on separated milk. The cause should be eliminated and castor oil administered. Sometimes a teaspoonful of ground Jamaica ginger given in hot water will be valuable in giving relief if the bloat is severe enough to cause colic.

**Scours or Dysentery.** Acute diarrhoea resulting from catarrh of the digestive tract caused by various forms of bacteria is more common among calves than among other new-born animals. Some of these various forms of diarrhoea are regarded by herdsmen as white scours. Overfeeding probably predisposes to this trouble. This rarely occurs when calves are nursing as the nourishment is taken frequently and in smaller quantities. Fermented or partially soured milk, feeding from dirty pails and other unsanitary conditions are all contributing causes.

Common scours are all too prevalent among calves and can be prevented by proper care and feeding. The causes previously outlined predispose calves to the bacterial infection which is associated usually with dysentery. Milk too rich in butter fat may also be a contributing factor. When calves are comfortably housed and regularity, not only in regard to the time of feeding but also with regard to the quantity and quality of the milk and its temperature and cleanliness, is observed there will be little trouble from common scours. When this disease makes its appearance the milk ration should be cut down at least one half. This relieves the digestive system and it can be assisted in freeing itself of obnoxious materials by the administration of 1 to 3 ounces of castor oil. Treatment with formalin also gives beneficial results. A stock solution of 1 part of commercial formalin to 31 parts of water is made and a teaspoonful of this is added to each pound of milk fed. When the trouble is under control the calf should be brought slowly back onto full feed. Where the calf is very weak and will not drink it can be kept nourished by the occasional administration of an egg. The shell of the egg is cracked and the egg, shell and all, put well back in the calf's mouth which is held close on the egg so that he will break it up and swallow it.

The stable or stall in which the calf is dropped should be thoroly cleaned and disinfected before the birth of the calf, and after the calf is dropped the stump of the umbilical cord should be thoroly cleansed with a five per cent solution of creolin and then painted with one part of tincture of iodine in two parts of glycerin. This treatment should be repeated once each day for four or five days. It is believed that this method of treatment will largely prevent a more serious form of dysentery, known to herdsmen as white scours.

If the disease has made its appearance a cathartic of 2 ounces of castor or 4 ounces of raw linseed oil should be given. Following this 6 grains of calomel may be given twice daily or the following may be used:

- Salol .................................. 50 grains
- Bismuth subnitrate .................. 1½ drams
- Sodium bicarbonate ............. 2 drams

Make five powders and give one in milk every 6 hours. This remedial treatment is equally beneficial for the milder forms of scours.

**Hemorrhagic Septicemia and Blackleg.** These two diseases are caused by germs and in some cases it is quite difficult to distinguish between them, even when laboratory facilities for diagnostic purposes are available. A vaccine now is being used for each one of them with satisfactory results. However, the vaccines are specific and the one is not effective in preventing
the other disease, so that a positive diagnosis must be made before any vaccine is applied, if satisfactory results are to be expected. At the outbreak of either disease the calves should be put in charge of a veterinarian as it is only with expert care that a cure can be accomplished.

Colds. Colds are frequent among calves and tho they may not cause many deaths they retard the growth of the calves and make them not only poorer in condition and stunted but also more expensive. Well ventilated, dry barns and good bedding will prevent colds and if contracted they can be cured by giving the calf a little extra attention, blanketing if necessary, feeding warm milk and water and preventing draughts.

Pneumonia. Pneumonia is usually brought on by a chill and in severe cases in valuable animals it should be treated by a veterinarian. The animal should be kept in a well ventilated, bright barn which should be cool rather than warm but not draughty. The animal should be kept warm with a blanket. The application of a mustard plaster in the pleural region very frequently brings relief and aids in recovery. The bowels should be kept open. Further treatment should be prescribed by a competent veterinarian.

Mange. Many young animals become affected with mange in the winter time. The loss of hair is frequently confined to the neck and the root of the tail but it may become generalized. Treatment consists of washing with coal tar dip at intervals of about ten days. Petrolatum oil may also be used.

Ring Worm. Ring worm is caused by a fungus and in calves appears most frequently about the head, especially the eyes and along the neck. The disease may be prevented from spreading by keeping the healthy and infested animals separated and thoroughly cleansing the stalls. The crusts should be removed by washing with soap and water after which the diseased skin may be treated with sulphur-iodide ointment well rubbed in, or tincture of iodine and iron, equal parts. Care should be exercised to see that this does not get into the eyes of the animal.

Lice. Lice are most prevalent on cattle in winter and may become so abundant as to cause the animals great discomfort and consequent loss of condition. They are more common in stables where sanitation is lacking and may be seen along the neck and back of the animals. Calves infected with lice generally appear to be unthrifty and are poor doers. Treatment may be carried out by hand applications, spraying or dipping, or the animals may be washed with a good coal tar solution, and the treatment repeated again in about two weeks. If dipping is deemed expedient, Farmer's Bulletin 909 of the U. S. Department of Agriculture will prove helpful.

Flies. Flies cause considerable annoyance to young calves and it will usually be found convenient to spray the small ones in hot weather. A good fly spray can be made from:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>4 1/2 quarts coal tar dip</td>
<td>4 1/2 quarts fish oil</td>
</tr>
<tr>
<td>3 quarts coal oil</td>
<td>3 quarts whale oil</td>
</tr>
<tr>
<td>1 1/2 quarts oil of tar</td>
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</tbody>
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Dissolve 3 pounds laundry soap in water, add the ingredients of the spray and bring the whole up to 30 gallons with luke warm soft water. This spray will keep off the flies and prevent the coats of the animals from becoming harsh.