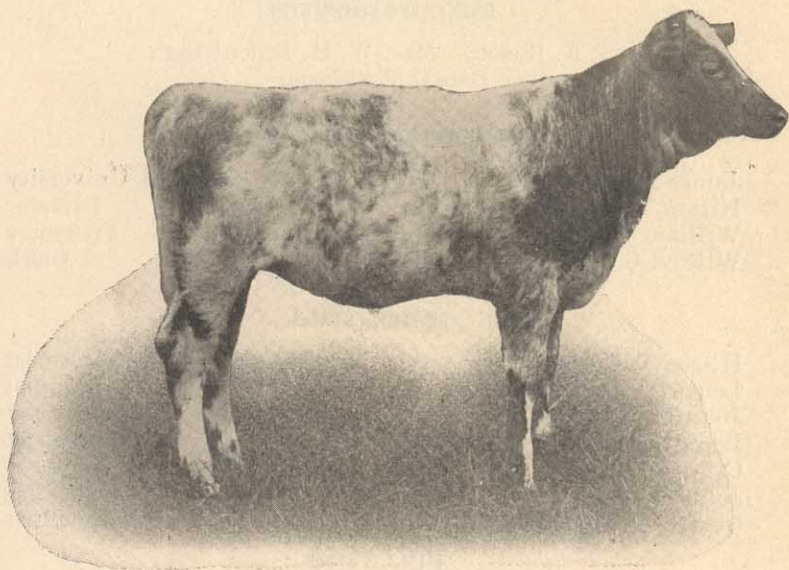


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UNIVERSITY OF IDAHO
AGRICULTURAL EXPERIMENT STATION
DEPARTMENT OF AGRICULTURE



ANIMAL HUSBANDRY
RAISING CALVES ON SEPARATOR MILK

By H. T. FRENCH.

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BULLETINS

The regular bulletins of the Station are sent free to all citizens of Idaho who request them. Late bulletins are:

42. Experiment in Pig Feeding.
43. Planting the Apple Orchard.
44. Alkali and the Treatment of Alkali Lands.
45. Trap Rock of the Palouse Regions. Road Material.
46. Grape Phylloxera.
47. Pruning the Apple Orchard.

Raising Calves On Separator Milk

H. T. FRENCH.

In any section where the dairy industry is in the process of development, and the manufacture of butter is contemplated or the selling of butter fat is under consideration, the question of raising calves successfully on skimmed milk is an important one. The use of the hand separator on the farm is one of the modern developments in dairying which has come to stay, and it is in connection with this feature of dairying that the experiments reported in this bulletin were undertaken.

Dairying is a comparatively new industry in Idaho, and before its introduction conditions were such as to lead people to think calves could not be successfully grown on anything but whole milk, and in most cases it was thought necessary for the calf to do the milking. Even when cows were milked by hand it was a strife between the calf on one side of the cow, and the milker on the other, to see which should get the largest portion of the life giving fluid, and very often the quadruped came out of the struggle with the lion's share. And that rather pleased the owner, for the calf would thus be made more thrifty for having gotten the better as well as the larger portion of the milk.

Under such tutoring it is not strange that farmers came to believe that this method, or a similiar one was the only way by which calves could be successfully raised. The argument is always presented that this is nature's method and it cannot be improved; but men forget that natural methods be-

long to native conditions and few are content to live under such conditions. The fact that cattle are domesticated at all shows that we are breaking away from conditions which surrounded cattle raising in its early history. Nature is too extravagant in her methods for one to follow who expects to make a success of raising cattle.

In modern dairy practice it is no longer thought desirable, or even feasible, to let the calf run with the cow for more than twenty-four hours when first born; and this is done on account of physiological reasons more than any other.

Conditions of the Experiment.

In order to demonstrate the feasibility of raising calves on milk from which the butter fat had been removed by means of the hand separator (centrifugal) the following work was undertaken:

Five calves from grade cows, which had been purchased for experimental purposes, were selected for the test. The calves were not a specially promising lot. Some of them were not even high grades. They were what the average farmer would term "scrub cattle" with the emphasis on the first word.

Age of Calves.

The calves were dropped on the following dates, and the numbers given here will be carried through the entire report.

No. 1 born February 25, 1902.

No. 2 born March 29, 1902.

No. 3 born March 25, 1902.

No. 4 born April 8, 1902.

No. 5 born April 2, 1902.

Treatment of Calves.

The following method of feeding was the one used by us in rearing these calves and has become the regular practice in feeding all young calves on the College farm.

The calves were separated from their dams within forty-eight hours after they were dropped, and in most cases were allowed to suck only once or twice before being removed to the pens in which they were to be fed. The cows were placed in the stalls where they were afterward kept and milked. The cows are always placed in box stalls from a week to ten days prior to the end of the period of gestation.

After removing the calf it is necessary very often to withhold the milk for twenty-four hours, or until the calf gets real hungry, before it is easy to teach it to drink. Stanchions, illustrated in Figure 1, are used for confining the calves while teaching them to drink milk, and afterward for feeding, until they are entirely weaned four to six months later.

Figure 2 shows the calves in place some taking their milk ration, and others looking for the grain ration which follows the milk.

Whole Milk.

The calves are given whole milk from their own dams for the first five to seven days. This is weighed out to them, or carefully measured, to obviate the danger of over-feeding. Six to eight pounds is the limit for large thrifty calves, and a great many will do better on four or five pounds twice a day. It would be better no doubt to feed the calves less but oftener during the day; but there are serious objections to this in actual practice, owing to the difficulty of warming the milk or else milking the cows several times each day out of the regular order.

Stanchions.

The advantage of the stanchions, for confining calves while drinking the milk and eating the grain, is obvious. There is no butting of pails or of each other, and best of all the attendant is not annoyed by the friendly attentions of his subjects, when whetted by a keen appetite for the delicious milk they crave so much.



FIG. 1



FIG. 2

The stanchion is a simple device made of light material and very cheap. Those in the illustration are made of 1 x 3, rough slats three feet long fastened with a bolt at the bottom and held at the top by a block, seen in Figure 1, which is also held in place with a bolt through one end. The frame above is made of 1 x 6 and stayed by 1 x 4 uprights to hold it in place. The box in front is made of 1 x 12 material with slats nailed across the top to separate the pails and to keep them from being easily over-turned. The box in front has a tight bottom to hold grain which is fed to the calves after the milk is disposed of. The stanchions occupy 18½ feet and accommodate ten head of calves at one time.

Method of Feeding.

As stated above the calves are given whole milk fresh from the cow twice daily during the first five to seven days, at the end of which time a portion of the whole milk is withheld from each ration and warm separator milk substituted. At first not more than half a pint is substituted, and this is increased daily until at the end of three weeks the calf is on separator milk entirely instead of the whole milk. When the feeder begins to withhold the whole milk, and to substitute the separator milk, he begins to teach the calf to eat whole oats. This is done by placing not more than a tablespoonful in the box in front of the calf after it has drunk the milk. The calf knows nothing of oats; but in nosing about it will get some of the oats in its mouth and in a very short time will learn to like them. Whole oats are preferred to rolled or ground oats, for the husk of the oat is then so thoroughly attached to the grain that it will be masticated with the kernel, and the calf having sharp teeth will have no difficulty in grinding it.

The ration of oats will be gradually increased as more of the whole milk is withheld, and separator milk substituted, until at the end of three or four weeks the calf will be getting

half a pint twice a day. The amount depends on the calf, for some animals will eat the oats more readily than others. We have never had a calf refuse them entirely, and some animals will take quite a heavy ration. This is the manner of teaching all the calves on the farm to eat their first coarse feed, and is the way the animals in this experiment were reared.

Kind of Oats.

It is found that there is quite a difference in the quality of oats for calves. We have found that an oat with a thin hull is best. The large, coarse, thick hulled oats are not so readily eaten and appear to injure the calf's mouth. We are using a variety of black oat at present; but have used white oats quite as successfully.

Separator Milk.

Now that the calf is entirely on separator milk a few suggestions may not be out of place. First and most important is the amount necessary. Too many overfeed, thinking that the milk is of little value and consequently a large amount should be fed. This is a mistake. The calves under discussion did not get more than eight pounds, one gallon practically, at a single feed; and the majority of them did not take this amount.

The milk should be fed warm always. We fed it fresh from the separator at a temperature of eighty to eighty-five degrees. If it were raised to ninety degrees it might be still better. It is not safe to trust the finger to determine the temperature. A fifteen cent thermometer is more accurate.

Other Coarse Feed.

After the calves have finished the ration of oats, which requires an hour or so, they are released and allowed to pass into a box stall. This stall is provided with feed racks about the walls which are filled with the choicest hay the farm affords.

The calves, even those only five or six days old, soon learn to pick this tempting bit of hay instead of sucking each other's ears, as they are apt to do when fed in the ordinary way. Eating the oats, after drinking the milk, dries out the mouth and the calf loses the desire to suck his neighbor's ears. In an hour, after turning the calves into the pen where the hay is found, they will lie down contented and happy. A pail or two of clean fresh water should be placed within reach of the calves during the day.

The pails in which the calves are fed must be kept clean and sweet. The milk if fed fresh from the separator will be sweet also. If any of the calves are inclined to scour give an ounce of lime water in the milk. We always keep this on hand for such emergencies.

Pasture.

Sometimes calves are turned into pasture too early in the spring. When the grass is very young, and the weather is not warm, it is better to keep the calves in box stalls and feed them on hay with milk and grain ration. Nothing is gained and often much injury results from turning the calves on pasture too early.

The calves under discussion were not turned out to pasture until May 10th and then only for a short time each day. The calves are seen in Figure 3, turned out for the first nip of grass. The milk ration was continued until the calves were four to six months old, and then gradually withheld and the ration of oats continued night and morning for a few weeks longer, or until the fresh hay was ready to feed.

During the hot weather of summer, when the flies are troublesome, the calves were turned in the pasture at night and kept up during the day. This practice we consider very important, for experiments show that calves will lose more from being worried with flies and hot weather than they can

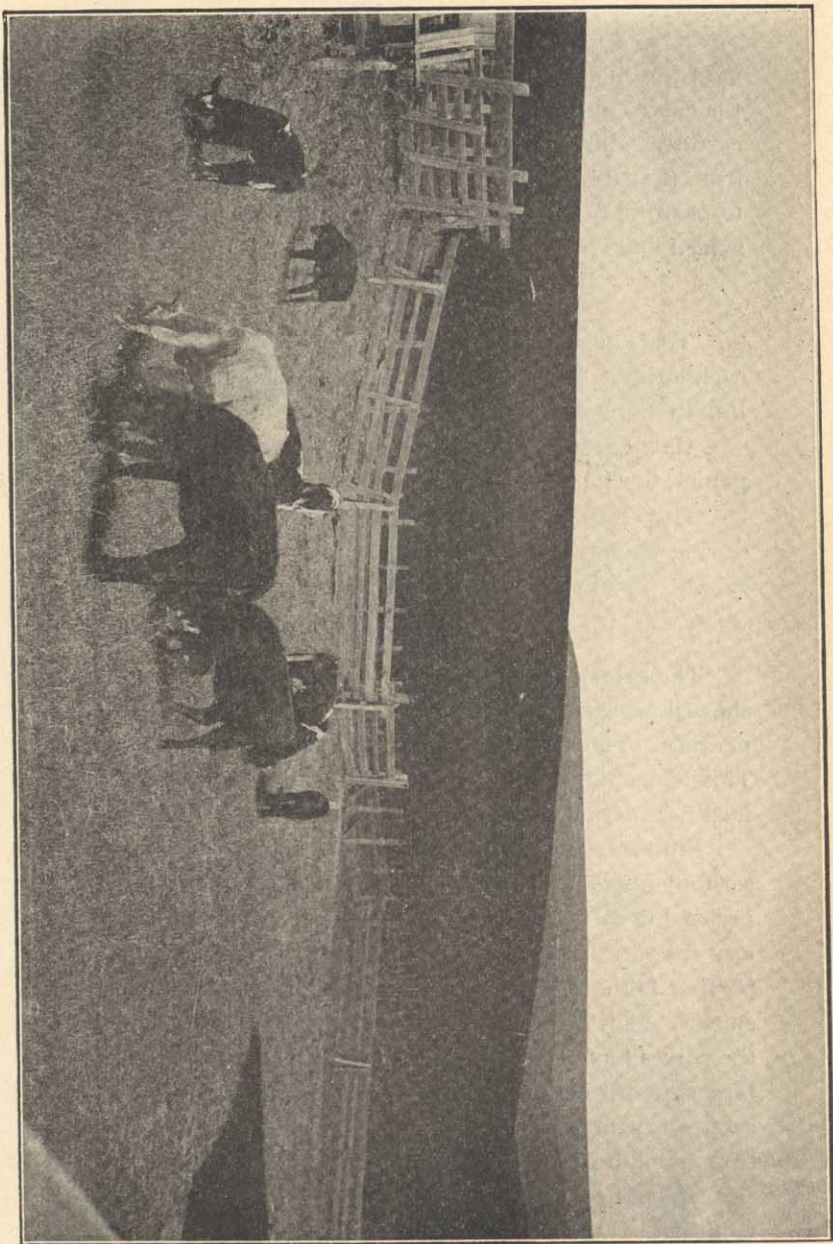


FIG 3

gain from food consumed under such conditions. In the fall the calves were placed in stalls and fed a ration of hay and carrots. Ensilage was added to the ration February 9th and from that time until May 10th, when they were again turned to pasture, careful account was kept of amount of feed consumed.

Account of Food.

From birth to February 9, 1903.

Total amount of milk consumed, average of 150 days for each animal, 10,570 pounds, which, valued at twenty cents per hundred, amounts to \$20.14.

Oats consumed in 200 days, 2000 pounds, at one cent per pound, \$20.00

Hay 3025 pounds at \$8.00 per ton, \$12.00. Carrots fed during winter, 60 days, 600 pounds, at $\frac{1}{4}$ a cent per pound, \$2.50. Total cost of food for five steers, \$54.74

Weight of Calves.

The calves were weighed the first day of each month and showed an average gain February 9th 1903, of 1.59 pounds per day. The average weight at this time was 512 pounds. This is not large, at the same time it was made at a cost for food not including pasture of 2.13 cents per pound.

From six to twelve months of age is the critical and scrubby stage for calves reared on separator milk. At this period the calves present the most unattractive appearance of any time in their life. They develop a stomach out of proportion to the rest of their body and their coat is not quite as smooth as it is when calves run with their dams. However the calves have learned how to eat and digest coarse feed in larger quantities than calves reared on whole milk. The digestive organs are better developed for practical feeding, from this period on to maturity, than in calves fed whole milk.

The cut on the title page shows a skim milk calf at six months.

History from February 9th 1903, to February 9th 1904, When Calves Were Sold for Beef.

First Period February 9th to May 10th 1903.

The steers were put on a ration of hay, corn silage and carrots, February 9th 1903, and this was continued until May 10th, when the steers were again turned into pasture. The idea was to carry them through the winter on a maintenance ration of coarse feed with no grain except the small amount of corn obtained from the silage. During this period of 90 days the steers consumed 1726 pounds of hay, 6342 pounds of carrots and 8402.5 pounds of corn silage. The total gain in live weight was 392 pounds, or an average of .87 of a pound per day for each steer. This might have been increased no doubt by adding grain to the ration; but we wished to determine what could be done without the grain.

The cost of the food for 90 days was \$24.04, making the cost of gain in live weight \$6.13 per hundred.

Second Period May 10th to September 15th 1903.

The steers were turned on pasture May 10th; but as the pasture was short it was supplemented, a portion of the time, with a feed of green clover, rye and vetch mixed, and alfalfa. This was cut and fed in the stalls. No grain was fed during this time.

From May 10th to September 15th, a period of 128 days, the total gain was 1,280 pounds, or an average gain per steer of two pounds per day. This is a very satisfactory gain on coarse feed with no grain ration. It illustrates the capacity of the steers for coarse feed which they are able to digest and assimilate.

Third Period, September 15, to February 9, 1904, the Close of the Experiment.

On September 15th the calves were put in stalls at night, given a feed of rolled oats, and then turned out again to pas

ture. In October green corn was fed to the steers in pasture. The grain ration was light, only amounting to five pounds per day for each animal. This was kept up until November 5th, when carrots were substituted for the green corn. On November 22, corn silage was substituted for carrots and the grain ration was cut down one half, it having been raised a few days to ten pounds per day. The steers were given a small ration of hay. This method of feeding was carried on until the close of the experiment.

The amount of grain, silage and oats consumed during this time is as follows: Rolled oats 5272 pounds, corn silage 11,890 pounds and carrots 800 pounds. The gain in live weight, during this period of 147 days, was 1225 pounds or an average daily gain for each steer of 1.66 pounds. This is 100 pounds of gain in live weight for each 430 pounds of grain consumed; which is a very good showing when compared with other cattle feeding experiments.

Condition of Cattle When Slaughtered.

Figure 4 shows the steers in yard before slaughtering, and Figure 5 the meat in the shop. The steers dressed out a trifle better than sixty per cent. of live weight, showing that they were fairly well finished. The meat was well marbled and fat light colored. It was pronounced by the butcher prime beef in every particular.

The steers were all slaughtered under two years of age at an average weight of 1013 pounds. The average daily gain from birth was 1.46 pounds. The best steer No. 1 made 1.68 pounds. There was one steer that dropped down to 1.34 pounds per day which brought the average for the lot down to 1.46, as given above.

The steers sold for \$4.75 per hundred or an average of \$48.12 per head. This is a very good showing for yearling

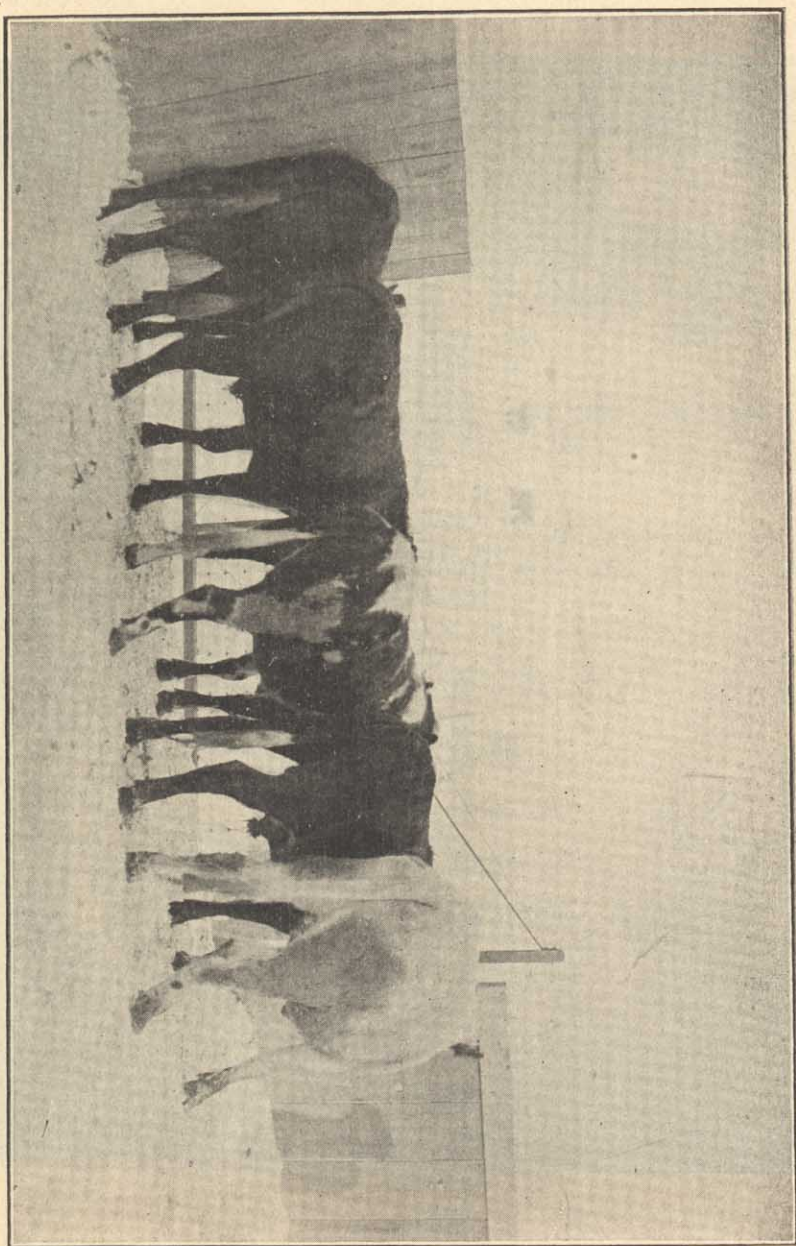


FIG. 4

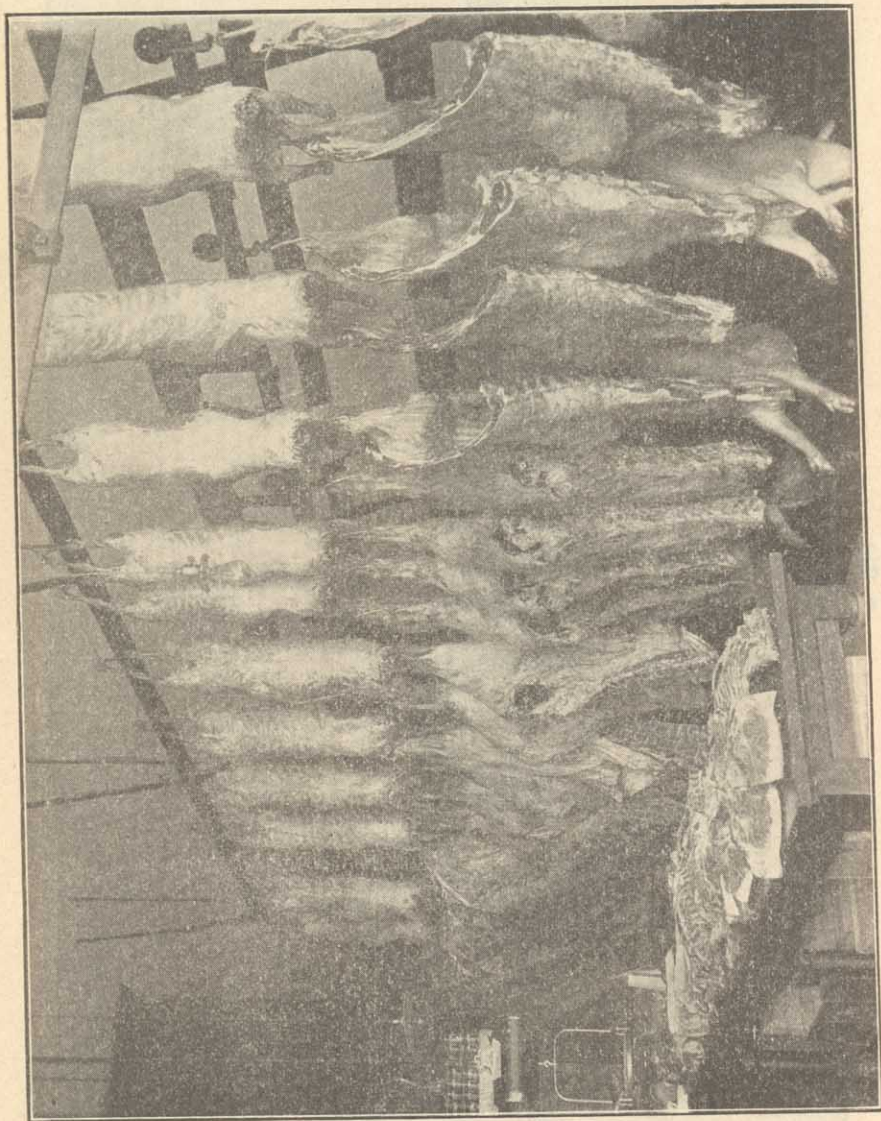


FIG. 5

steers, and demonstrates the possibilities in feeding baby beef raised on skim milk.

The most profitable period of feeding was in the summer before they were finished. Better bred steers would have made better gains and consequently a better showing.

Some Deductions.

1. It is possible to raise calves profitably on separator milk by substituting whole oats in place of the butter fat which has been removed.

2. Calves fed in this way will do better on coarse feed alone than those raised on whole milk.

3. Early maturity is not hindered by this method of feeding

4. The value of butter fat saved, was more than four times the value of the oats consumed.

5. There was eighteen dollars profit per head over and above cost of feed.

6. The steers were sold as "baby beef" at an average age of twenty-two and one-half months.

7. The steers made an average gain of 2 pounds per day during a portion of the time, (128 days) on coarse feed alone.