

Managing and Feeding Holstein Steers: Birth to 350 Lbs

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New developments in feeding dairy steers along with fairly inexpensive feed and a good potential for profit have persuaded many dairy and beef producers to raise dairy beef as a secondary enterprise. However, dairy beef and particularly newborn calves present many challenging health and nutrition management decisions which must be addressed to maintain a profitable enterprise.

This publication will look at the important considerations in managing dairy beef from birth to a weight of 350 lbs.

The newborn calf

To run an efficient baby calf program, dairy producers must start with a good dry cow program. The dry cow's weight should be optimized during the end of her lactation and into the dry period. At drying off, the cow should be dewormed and vaccinated with a scour guard vaccine. This should be repeated three weeks prior to calving. An injection of vitamin E and selenium at this time is also recommended.

These practices along with a good dry cow nutrition program are important so that the cows can produce an adequate supply of high quality colostrum.

The cow should be allowed to calve in a clean, dry, draft-free, comfortable environment. Immediately following birth, the calf should be given two quarts of high quality colostrum, followed by an additional quart within a couple of hours. It is crucial that the calf receive the colostrum as soon as possible because its ability to absorb colostral antibodies (immunoglobulins) declines rapidly from the time of birth.

A calf is born essentially without any immunity (resistance) to infections and diseases. A newborn calf acquires passive immunity when it absorbs immunoglobulins through the intestinal wall during the first few hours of life. Each form of immunoglobulin gives a calf some immunity against a specific disease or infection. Both the amount and quality of colostrum is important to a calf's survival. See table 1.

Table 1. Colostrum fed during the first 12 hours after birth and heifer calf mortality¹

Amount fed (lbs)	No. herds	Heifer calf mortality (%), (calves 1 wk to 6 mos old)
2-4	18	15.3
5-8	16	9.9
8-10	26	6.5

¹Clemson University

Treat the calf's navel with tincture of iodine (don't clamp or tie off the navel). Identify the calf so that accurate records can be kept.

For the dairy producer who intends to raise a calf until it is weaned or beyond, and then sell it to another beef producer to background or finish, some special consideration should be given to a calf health program. Such calves will be prone to developing a condition known as hemorrhagic calf syndrome (a bleeding disease) as well as a high incidence of bovine viral diarrhea, respiratory problems and cryptosporidiosis (a calf scour). A health program for these calves should attempt to get vaccines into the calf as soon as the antibody level is low enough to develop a response to the vaccine and before the calf gets sick.

In most cases, it is better to spend a little extra money on prevention than to concentrate on treating sick calves.

Health program for the newborn calf

Day 1 in the barn

1. Administer IBR, BVD, PI³ and BRSV. Using modified live virus vaccines, flood the body with vaccine virus which prevents the virulent disease-producing viruses from entering. This vaccination program also causes the calf to produce interferon—a non-specific antibacterial, antiviral substance that protects the calf from a multitude of disease-producing organisms.
2. Administer subcutaneous long-acting penicillin.
3. Administer pasteurella vaccine.
4. Inject with vitamin A, D, E, multi-B and iron. In many instances, repeating this combination after four weeks is helpful.
5. Implant the calf.
6. Knife castrate bull calves (if not castrating on the first day, wait until the calf is at least one month old.)
7. Pour for lice.

Coccidia and crypto scours can be controlled with coccidiostats. Some extra-label use products can also be effective, but their use requires a veterinarian's involvement.

Do nothing that causes stress to the calf between days 8 and 28 of its life. During this time, the calf is very susceptible to stress because its adrenal gland (which produces the cortisone that calves need to adapt to stress) is non-functional. The calf is born with a functional adrenal gland, but it quits working around the 8th day and does not resume until approximately the 28th day. Therefore, avoid all stress such as moving, dehorning, castrating or similar activities during this time.

2 days prior to weaning

1. Repeat intramuscular IBR, BVD, PI³ and BRSV.
2. Repeat intramuscular pasteurella vaccine.

Prior to shipping or mixing in larger groups

1. Repeat intramuscular IBR, BVD, PI³ and BRSV.

It is impossible to write a single health program that covers every situation. Consult your veterinarian about the best program for your animals because each farm presents unique challenges. Based upon diagnosis, postmortems or other medical evaluations, using antibiotics, hyperimmune serums, blood transfusions and other treatments can be successful.

Housing calves

Place the animals in individual housing units that are clean, dry, draft free and comfortable. Individual housing is preferred over group settings or pens because there is less likelihood of disease resulting from nose to nose contact, sucking and inhaling air with high concentrations of microorganisms. A warm housing system is not necessary and in fact may be detrimental because of the increased growth of

Table 2. Quality of proteins and fats in milk replacers.

Protein sources		
<i>Best</i>	<i>Acceptable¹</i>	<i>Inferior</i>
Skim milk	Specially manufactured soy flour	Unprocessed soy flour
Buttermilk	Soy concentrate	Meat solubles
Whole whey	Hydrolyzed fish protein	Fish flour
Delactosed whey	Distiller solubles	
Casein ²	Brewer's yeast	
Milk albumin	Oat flour	
Whey protein concentrate	Wheat flour	

Fat sources		
<i>Best</i>	<i>Acceptable¹</i>	<i>Inferior</i>
Lard	Hydrogenated vegetable oils	Liquid vegetable oils
Tallow		

¹These specially processed products are acceptable when used with one or more sources from the "Best" column.

²At least half of the protein should be derived from casein.

microorganisms in a warm environment (versus a cold one).

There are several good housing alternatives available. The calf hutch, the solar kennel or other individual systems all work well if managed properly. For convenience, flexibility and cost, the calf hutch is an excellent choice. The important points to remember are to make sure the calf's environment remains clean, dry, draft free, well-ventilated, comfortable and that nose-to-nose contact is avoided.

Calf nutrition

Newborn calves can be fed colostrum, transitional milk, whole or skim milk, mastitic or antibiotic treated milk, and whey. For an excellent discussion of these feeding practices, see pages 12–23 of *Raising Dairy Replacements* (NCR205) available from Extension Publications at the address on the back page. Most dairy beef producers do not have access to these feeds and will use milk replacer as the primary source of feed for the new calf. Calves

should normally be fed twice per day in 12-hour intervals. Feed them using buckets or bottles. Nipples are more difficult to clean and sterilize than open buckets and generally result in higher mortality, but are more acceptable to the calf.

Milk replacer should be fed starting with the third to fifth feeding. Milk replacers vary in quality and price. Producers often try to get by with a less expensive milk replacer, but generally end up paying for it in the long run in poorer performance and sick calves. Calf performance is a good indicator of the value of the milk replacer. Table 2 lists various protein and fat sources of milk replacers and their acceptability. Producers should compare feed tags for the quality of the product before purchasing it.

Milk replacer should contain 12.5% solids in the solution (6 lbs powder in 5 gal of water). The amount of solution per feeding depends on the calves' body weights. The usual level is 2 pints of solution per meal (4 oz powder) for

Table 3. Range in nutrient specifications for “grain starters” and “complete starters.”

Nutrient (D.M. basis)	Grain starter ¹		Complete starter ²	
	Low	High	Low	High
Energy, TDN, %	76.0	78.0	70.0	74.0
Crude protein, %	15.0	20.0	15.0	18.0
Ether extract, %	2.5	5.0	2.5	5.0
Crude fiber, %	2.0	7.0	8.0	15.0
Calcium, %	0.4	0.6	0.4	0.6
Phosphorus, %	0.3	0.4	0.3	0.4
Vitamin A, IU/lb	750	1000	750	1000
Vitamin D, IU/lb	140	300	140	300

¹Offer free choice with or without forage.

²Offer free choice without additional forage.

calves less than 80 lbs, 2.5 pints of solution (5 oz powder) for calves 80–100 lbs, and 3 pints of solution (6 oz powder) for calves weighing more than 100 lbs. This amount should be increased every 2–3 days by ½ half pint per feeding as appetite and stool conditions allow.

When the calves are consuming 4 pints of solution per meal (8 oz powder) the level is held constant. In cold weather, calves can be fed 3 times per day at 8-hour intervals with the same volume of solution per feeding (4 pints solution per meal). Milk replacer should be mixed at 110–120° F and fed at 100–104° F. Maintaining a routine every day is important. Feeding equipment should be cleaned and sanitized daily to reduce disease.

Starter feed should be offered to the calves beginning on the fifth day in the barn. Calves will nibble and consume about a handful of food. Starter should be available free-choice; hand feeding a small amount every day will encourage them to eat. The amount of milk replacer solution should be kept constant at 4 pints per feeding (8 oz powder) and calves

allowed to consume more and more starter each day. Approximately 75% of calf growth from birth to 200 lbs is due to starter feed, rather than milk replacer.

Weaning calves

To wean, reduce the milk replacer powder gradually over 4–5 days while keeping the total volume constant. A good rule of thumb is to wean the calf when it consumes 1½–2 lbs of grain or starter daily on a regular basis (for at least the previous 4 days). The consumption of calf starter will increase even more after weaning. Depending upon how well the calf develops, it will be 5 to 7 weeks of age when it is weaned. Clean fresh water and starter feed should be available to the calves at all times following weaning.

Starter feed

Starter feeds should be very palatable, coarse-textured or pelleted concentrate. They should contain 75–80% TDN and 15–20% crude protein (see table 3). Most commercially available starter feeds have 16–18% crude protein on an as-feed basis.

There are two types of starters. Grain starters are fed with forages. Complete starters contain forages.

A complete starter is preferred by many producers, especially those who raise larger numbers of calves. Since calves can't select among feedstuffs, it is easier to control their intake of concentrate and forage to make sure all calves consume both concentrate and forage. Keep starter fresh by feeding small amounts.

Regularly remove and replace any uneaten feed.

Physical form of the starter feed influences intake and performance of the calves. Recent research shows whole corn to be superior to rolled corn for baby calves (Chester-Jones, 1989). Average daily gain and efficiency of feed utilization were improved in calves fed whole corn compared to rolled corn in the starter feed. There are few published studies comparing complete pelleted to textured feed (moisture of corn, oats, molasses and pellet) in baby calves. Based on limited research data, but widely held opinion, calves consume more textured feed and gain more weight than calves fed complete pelleted feed. A successful calf starter feed ration developed at Cornell University is given in table 4.

Feeding from 200–350 lbs

An underlying principle in managing baby calves is to make changes gradually. Most feed programs provide a constant level of starter supplement (2–3 lbs per head daily) and *ad libitum* corn. As the calf's feed intake increases, the calf consumes more corn. This has the effect of gradually diluting the nutrient density of the feed. With the aforementioned feeding program, the pellet in a textured starter feed is the same as the supplement for calves from 200–350 lbs. When they weigh 200 lbs,

Table 4. Calf starter¹

Ingredient	% in formula	Lb/ton
Ground ear corn	22.5	450
Oats (whole or ground)	25.0	500
Beef pulp	16.0	320
Brewers grains	10.0	200
Soybean meal	18.0	360
Molasses	7.0	140
Dicalcium phosphate	1.0	20
Trace-mineralized salt	.5	10
	100.0	2000

Plus 4 million IU Vitamin A and 1 million IU Vitamin D

¹Cornell University

the calves are consuming the same amount of pellet in the textured feed as they would if fed supplement and corn. This reduces stress on the calf during the transition from textured feed to supplement and corn.

Use of urea in starter supplements is discouraged. Although cost per pound of gain may be less for calves fed urea than calves fed all-natural proteins, the value of gain in the young calf is usually not considered in projecting economic return of the project. A young calf has phenomenal ability to grow rapidly and efficiently. Maximizing this ability is important to maximize profit to the calf producer.

With good management practices, calves should reach 350 lbs in about 16–18 weeks.

At this point, they can go on to a grower ration containing higher levels of forage or continue on with a high concentrate of “no roughage” program depending on the producer's performance and the availability of feedstuffs.

The dairy beef enterprise can be a very profitable business if conditions are right and management practices are sound. Additional information regarding dairy beef can be found in the following University of Wisconsin–Extension publications available from your county Extension office.

NCR205 *Raising Dairy Replacements*

A3360 *Wisconsin Farm Enterprise Budgets—Holstein Steers*

MWPS-6 *Beef Housing and Equipment Handbook*

MWPS-7 *Dairy Housing and Equipment*

A2677 *Profit Guidelines for Purchasing Feeder Cattle*

A3307 *Housing Dairy Replacements*

A3141 *Calf Management and Facilities on Selected Wisconsin Dairy Farms*

A2841 *Calf Management—Birth to Weaning*

A2823 *The Calf Hutch—Building and Using*

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