

# Managing and Feeding Holstein Steers: From Purchase to 350 Lbs

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**N**ew developments in feeding dairy steers, the availability of fairly inexpensive feed-stuffs and good profit potential have persuaded many dairy and beef producers to raise dairy beef as a secondary enterprise. Dairy beef and particularly newborn calves present many challenging health and nutrition management decisions, however, which must be addressed to maintain a profitable enterprise. This fact sheet will look at the important management considerations for dairy beef from the time a newborn calf is purchased until it reaches a weight of 350 lbs.

## The purchased calf

Many dairymen and dairy beef producers who choose to raise dairy beef buy newborn calves so that their herds will be large enough to reach their profit objectives.

If possible, try to purchase calves from a single, reputable source. Buy calves that are less than one week old. Calves have a very low level of disease resistance and therefore, poor ability to handle stress from the 8th to the 28th day of their lives. This is because the adrenal gland, which produces the cortisone needed to adapt to stress, does not function during this period.

The adrenal gland functions when the calf is born, but stops around the 8th day and resumes on approximately the 28th day. Therefore, avoid subjecting the calf to stressful procedures such as moving, dehorning, castrat-

ing or similar activities. Purchasing calves before they are a week old will allow them to "get settled in" before the critical eighth day.

Make every effort to purchase sound calves that are alert and aggressive. Avoid animals with wet tails (this indicates diarrhea), that produce excessive nasal discharge or have a hunched-back, dropped-ear appearance. Also reject calves with hip tags or other evidence of previous sales. The one-day trip from their home farms to the grower's barn produces more than enough stress for these lightweight calves. You may have to pay more to get good calves, but remember that "you get what you pay for."

After the calves arrive at the farm, observe them for scouring or sunken eyes. Calves exhibiting these traits should receive 3–4 pints of electrolyte solution administered via bottle, bucket or esophageal feeder. Other calves can be offered a quart of electrolytes and all should be allowed to rest until feeding time.

## Health program for the purchased calf

Producers should work closely with their veterinarians to develop calf health programs for their farms. Working in conjunction with your veterinarian, do the following when a calf arrives.

1. Vaccinate for IBR, PI<sup>3</sup> BVD, and BRSV with a modified live vaccine. This vaccination program also allows the calf to produce

interferon—a non-specific antibacterial, antiviral substance that protects the calf from a multitude of disease producing organisms.

2. Give coccidiostats to control coccidia and cryptosporidiosis. Some extra label use products can also be effective, but their use requires a veterinarian-client-animal relationship.
3. Inject new calves with selenium, vitamins A, D, E, multiple B and iron. In many instances repeating this combination after four weeks is helpful.
4. Pour calves for lice.

#### **At four weeks**

1. The calves should be vaccinated for BRSV with a modified live virus.

#### **At six weeks**

1. Vaccinate the calves with a third dose of the BRSV modified live virus.
2. Vaccinate calves with their first dose of clostridium C & D toxoid-bacterin. To stimulate any immunity to BRSV, two doses are required. It is important to protect calves from pasteurilla pneumonia following the stress of weaning. BRSV is a triggering virus for pasteurilla pneumonia.
3. Implant the calf.

#### **At ten weeks**

1. Vaccinate for IBR, BVD, PI<sup>3</sup> and BRSV using modified live virus.
2. Vaccinate calves with a second dose of clostridium C & D toxoid.

Anytime you mix or regroup calves, an additional vaccination of IBR, BVD, PI<sup>3</sup> and BRSV using a modified live virus is helpful. It also helps to revaccinate them for IBR, BVD, PI<sup>3</sup> and BRSV just prior to sale. This will help convince the buyer to buy your calves again if you are in the feeder calf business.

Immunizing young calves is extremely challenging. Many vaccines are not labeled for use in young calves and are therefore extra label use products. Maternal (colostral) antibodies interfere with the immune response to vaccines. Colostral antibodies for IBR, PI<sup>3</sup> and BVD remain in the calf for two to eight months. Many factors such as the quality, quantity and time of the first feeding of colostrum, affect the amount of colostral antibodies in a calf.

Vaccines produce immunity only after colostral antibodies have reached a low level. Calves are susceptible to disease when their antibody levels are down. Vaccinations are given in an attempt to get vaccine into the calf as soon as its antibody level is low enough to develop a response to the vaccine and before it gets sick. This is one reason for the repeated vaccinations.

#### **Housing calves**

Place calves in individual housing units that are clean, dry, free of drafts and comfortable. Individual housing is preferred over group housing or group pens because it reduces the chance of disease problems from nose-to-nose contact, or from inhaling air with a high microorganism content. A warm housing system is not necessary and may even be detrimental since microorganisms grow more rapidly in a warm environment than a cold one.

There are several good housing alternatives available. The calf hutch, solar kennel or other individual housing 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 that the calf's environment should remain clean, dry, draft free, well-ventilated and comfortable and that nose-to-nose contact should be avoided.

## Calf nutrition

Newborn calves can be fed colostrum, transitional, skim, whole, mastitic- or antibiotic-treated milk, and whey. For an excellent discussion of these feeding practices, see pages 19–23 of *Raising Dairy Replacements* (NCR205) available at the address given on the back page.

Most dairy beef producers will 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 at 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 they are more acceptable to the calf. The first two to four feedings should consist of an energy-containing electrolyte solution.

Feed calves milk replacer 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 variety, but generally end up paying for it in the long run with poorer per-

formance and sick calves. Calf performance is a good indicator of a milk replacer's value.

Table 1 gives various protein and fat sources found in milk replacers and their acceptability. Always compare feed tags to judge a product's quality 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. Normally, this is two pints of solution per meal (4 oz powder) for 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 pint per feeding as appetite and stool conditions allow.

When the calves consume 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

**Table 1. Quality of proteins and fats in milk replacers.**

| Protein sources          |                                  |                       |
|--------------------------|----------------------------------|-----------------------|
| BEST                     | ACCEPTABLE <sup>1</sup>          | INFERIOR              |
| Skim milk                | Specially manufactured soy flour | Unprocessed soy flour |
| Buttermilk               | Soy concentrate                  | Meat solubles         |
| Whole whey               |                                  | Fish flour            |
| Delactosed whey          | Hydrolyzed fish protein          | Distiller solubles    |
| Casein <sup>2</sup>      |                                  | Brewer's yeast        |
| Milk albumin             |                                  | Oat flour             |
| Whey protein concentrate |                                  | Wheat flour           |
| Fat sources              |                                  |                       |
| Lard                     | Hydrogenated vegetable oils      | Liquid vegetable oils |
| Tallow                   |                                  |                       |

<sup>1</sup> These specially processed products are acceptable when used with one or more sources from the "best" column.

<sup>2</sup> At least half of the protein should be derived from casein.

volume of solution per feeding (4 pints of 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 calves beginning on the fifth day in the barn and should be available free choice. Calves will nibble and consume about a handful of feed. Hand feeding a small amount every day will encourage consumption. 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 a calf when it consumes 1½–2 lbs of grain or starter daily on a regular basis (in the previous four days). The consumption of calf starter will increase even more after weaning. Depending

upon how well the calf develops, it will be five to seven weeks of age when it is weaned. Clean fresh water and starter feed should be available to 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 2). Most commercially available starter feeds have 16–18% crude protein on an as-fed 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.

**Table 2. Range in nutrient specifications for "grain starters" and "complete starters"**

| Nutrient (D.M. basis) | "Grain starter" <sup>1</sup> |      | Complete starter <sup>2</sup> |      |
|-----------------------|------------------------------|------|-------------------------------|------|
|                       | 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  |

<sup>1</sup>Offer free choice with or without forage.

<sup>2</sup>Offer free choice without additional forage.

The 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 3.

### Feeding from 200–350 lbs

An underlying principle of 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, it consumes more corn. This has the effect of gradually diluting the nutrient density of the feed. With the aforementioned feeding pro-

gram, the pellet in a textured starter feed is the same as the supplement for calves from 200–350 lbs. When they weigh 200 lbs, the calves are consuming the same amount of pellet in the textured feed as they would if they were 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 for calves fed all-natural proteins, the value of gain in the young calf is usually not considered in projecting economic return. The 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 with a high concentrate or “no roughage” program depending on the availability of feedstuffs.

With the right conditions and efficient management practices, the dairy beef enterprise can be

**Table 3. Calf starter<sup>1</sup>**

| Ingredient             | % in formula | Lb/ton |
|------------------------|--------------|--------|
| Ground ear corn        | 22.5         | 450    |
| Oats (whole or ground) | 25.0         | 500    |
| Beet 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     |

<sup>1</sup>Cornell University

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

a very profitable one. Additional information about dairy beef can be found in the following publications available from your county Extension office or from Extension Publications at the address given below (not all of these titles are available from Extension Publications).

*Beef Housing and Equipment Handbook (MWPS-6)*

*The Calf Hutch—Building and Using (A2823)*

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

*Calf Management—Birth to Weaning (A2841)*

*Dairy Housing and Equipment (MWPS-7)*

*Housing Dairy Replacements ((A3307)*

*Profit Guidelines for Purchasing Feeder Cattle (A2677)*

*Raising Dairy Replacements (NCR205)*

*Wisconsin Farm Enterprise Budgets—Holstein Steers (A3360)*

## References

1. Chester-Jones, H., D. M. Ziegler, J. C. Meiske, and B. T. Larson. 1989a. Performance of Holstein steers fed starter diets containing rolled corn and pelleted supplements with protein level adjusted biweekly. Holstein-Beef Research 1989 Update Summary. University of Minnesota Southern Experiment Station. Dairy-Beef and Cattle Feeders Workshop.
2. Crowley, J., N. Jorgensen, and W. T. Howard, 198\_, North Central Regional Extension Publication 205. Raising Dairy Replacements, pp. 16–34.
3. Elliott, R. D., DVM. 1991. Current Practices in Holstein Steer Health Management from Birth to 20 Weeks. Northeast Regional Agricultural Engineering Service. NRAES-44, Holstein Beef Production, pp. 40-44.
4. Fox, D. G., D. J. Duhaime, M. L. Thenney, R. G. Warner, P. J. Comerford, T. R. Dockerty, W. A. Knoblauch and R. A. Milligan. 1986. Cooperative Extension Service, Cornell University. Fact sheet 1250. Cornell BEef Production Reference Manual. Producing Beef from Holstein Steers, pp. 1250.1-1250.12.



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