



Managing the Calf from Weaning Through Four Months of Age

The purpose of this article is to discuss feeding and management of the transition calf which, for our purpose, will be identified as a calf from weaning to 4 months of age. This is an age when calves are subjected to much stress and often do poorly; however, there is a shortage of information from research conducted with calves of this age. The lack of research is due in part to the fact that this is not an age when the animal uses a commercial product that yields sufficient revenue to make it feasible for any company to support much research, and research concerning management of this animal is not high on the priority for state or federal research funding.

“Some producers think of the calf before weaning as a baby, but that after weaning a significant change in maturity has taken place.”

This is unfortunate because in some ways the transition period is one of the most stressful periods of life. Full dependency on the rumen (which is still changing rapidly), a change from passive to active immunity, the need to adapt to a markedly different type of housing, and closer contact with other animals are stresses usually encountered during this period of time. Good management is needed to minimize the effect of these stresses, and to reduce or eliminate the post-weaning slump that often occurs at this time.

Assumptions

Ideally, certain things will be true about the calf when it is weaned. I will assume that these things

are true and will discuss the cause and effect when they are not true. These assumptions are:

1. The calf is healthy. Weaning is not a stress that should be imposed on a calf that is not healthy.
2. The calf was eating at least 1.5 pounds of dry feed on 3 consecutive days before it was weaned. If the calf is fed milk or milk replacer until it can eat and digest enough dry food to supply needed nutrients; it follows that the amount of dry feed consumed should be the most important criterion to use to determine when the calf should be weaned. Also, good feed consumption is a good indicator of good health.
3. The calf is between 4.5 and 7 weeks of age. Using good management and a good calf starter, most calves will be within this age range when ready to wean. However, each calf is an individual and should be treated as such, and age should not be the primary criterion for deciding when to wean a calf.
4. The rumen of the calf is properly developed from the standpoints of size, musculature, microorganisms, and papillae. The development of size and musculature are related to the bulk of dry feed that the calf has been consuming. Rumen microorganisms develop properly when provided the proper nutrients and are properly adapted to the specific feeds that are fed. The growth of rumen papillae depends on formation

of volatile fatty acids, especially butyric acid. These volatile fatty acids can be formed as a result of fermentation of concentrate-type ingredients. Proper morphological development of papillae, and

development of omasum, depend on an abrasive property of the feed, and concentrate-type ingredients may not supply this needed property.

Guiding Principles we Should Follow

A good management program for transition calves will be developed with the following rules or thoughts in mind.

1. Stress should be reduced as much as possible.
2. Unavoidable stresses should be spread out. It is actually the practice on some farms to wean, dehorn, castrate (if a male), change dry feed, and move the calf, all on the same day. Small wonder that the calf has a post-weaning slump. Weaning is a major stress and none of the other stresses should be imposed on the same day. Dehorning and castration should be accomplished early in the life of the calf so that stress is finished before the calf is weaned. For several days after weaning the calf should be kept in the same location (pen or hutch) and fed the same starter. This allows the calf to adapt to eating only dry feed without other stresses, and provides an opportunity to carefully observe the calf to be sure it is adapting all right.
3. Make ration changes gradually. This is a rule that should always be followed when feeding ruminants, and is especially critical for young calves.
4. Profit is not a four-letter word. Most dairymen are in the business to make a profit. Milk, milk replacer, and calf starter are relatively expensive. Poor quality in any of these feeds should not be tolerated; however, there is no point in using any of these when they are no longer needed. Therefore, the calf should be weaned at the proper time and calf starter should not be used when a good quality calf grower is satisfactory.

Recommended Program

Weaning to 3 months of age. When the calf is weaned, keep it in the same location for several days and feed the same starter free choice. During this period of time (\pm 7 days) carefully observe the calf. Dry feed intake should increase significantly

after cessation of feeding of milk or milk replacer. The physical nature of the starter should be such that it provides adequate abrasive value to support proper morphological development of the papillae. Adding 10% chopped ($\frac{1}{2}$ to $1\frac{1}{2}$ inches) alfalfa hay to the starter helps ensure that this need is met, and does not cause too much reduction in energy concentration. This alfalfa should be added to the starter during the first week of the life of the calf.

“A common recommendation is to feed no hay before weaning but feed it free choice after weaning.”

The problem with this is that some, if not most, calves will eat a lot of hay and little concentrate. The rumen microorganisms are not adapted to hay, and the hay does not provide enough energy even if the microorganisms were adapted; therefore, the rumen is not providing needed nutrients at the very time when the demand is higher than at any other time. By feeding a mixture of starter and chopped hay, we are ensuring that the feed consumed by the calf will be what we want it to be.

When the calf is moved from the hutch or pen it should be moved to a small pen that has only a few calves of the same size. A pen that provides 30 ft²/head and contains no more than 8 calves would be adequate. The same starter, containing 10% chopped alfalfa, and water should always be available. The feed manger and water container should be constructed and maintained so that the feed and water are readily available. While in this pen, the calf can adjust to group housing without the stress of dietary change. Calves can be moved from this pen (Transition Pen 1) after about two weeks.

Two more similar pens (Transition Pens 2 and 3) should be provided for the calves to move through, staying about 2 weeks in each pen. In the first of these the amount of chopped alfalfa should be increased to 15%, and in the second the amount increased to 20%. The mixed concentrate and alfalfa should always be available.

If desired, it would be possible to change to a less expensive concentrate mixture (a calf grower, Table 1) by the time the calf is 10 weeks of age, about the time the calf should be moving into Transition Pen 3.

In that case, the feed used in Transition Pen 1 could be mixed in equal parts with the feed used in Transition Pen 3 to provide a mixture of starter and grower, containing 15% alfalfa, to be used in Transition Pen 2. This provides a smooth transition in type of concentrate and amount of hay as the calf moves through the three Transition Pens.

As an example, if a calf weaned at 5 weeks of age, stays in the hutch or pen for 1 week after weaning, and stays in each Transition Pen for 2 weeks, it would be 12 weeks of age when it left Transition Pen 3. This schedule could be used as a guideline; however, each calf should be treated as an individual and should stay in each location (hutch or pen, or Transition Pen) for more or less than the indicated time, depending on the needs of the calf. Calves that need more energy can be kept in a pen for a longer period of time or could even be moved back to a previous pen. Those that are doing better or possibly are getting too fat could be moved ahead more rapidly.

“ Management is simple because the same feeds are always provided in the different pens.”

Movement of calves should be made by a person who makes the decision based on the condition of the calf and the size (weight and withers height) of the calf compared to growth standards. An 8-week-old Holstein heifer should weigh from 160 to 180 pounds and measure more than 30 inches at withers. A 3-month-old Holstein heifer should weigh from 220 to 250 pounds and height at withers should be more than 36 inches.

The advantages of using total mixed rations for heifers are the same as for lactating cows. If dairy heifers are given a choice of how much roughage and concentrate they can consume most will not choose the desired amount. Using the system described in this paper, at all times we are controlling the intake of the heifer. The amounts of alfalfa suggested (10, 15 or 20%) are estimates for average quality hay, and the exact amount will depend on the quality of alfalfa. More should be used if the quality is better because the higher quality alfalfa will have more energy and fewer stems.

Three to 4 months of age. A 3-month-old heifer that is the proper size, has normal rumen development, and has been adapted to increasing amounts of roughage should be able to use any type of feed, provided the ration is properly balanced. She should be able to use some silage or pasture; however, her energy requirement is still high so the roughage quality should be good and she will still need concentrates. Also, feed intake still must be high related to the size of the rumen and dry matter content of the ration should be fairly high.

While the feeding program for calves to 3 months of age would not need to change, rations for heifers over 3 months of age should be formulated based on current availability and price of ingredients. Many different rations are possible, some examples are shown in Table 2.

A very common mistake observed on many farms is that there is too much variation in size and body condition of heifers within a pen.

One ration cannot possible meet the needs of two heifers that differ greatly in size and/or body condition. Feeding a ration as a total mixed ration is highly recommended.

Tables are listed on the reverse side of this page.

Table 1 Examples of Calf Grower Mix ^{1,2,3}	Grower	
	1	2
Corn, Cracked	63.8	53.23
Oats, Rolled	9.9	
Barley, Rolled		20.48
Molasses	3.5	2.97
Soybean Meal	20.4	
Canola Meal		21.33
Limestone, Rolled	1.2	1.08
Dicalcium Phosphate	.27	
Salt	.18	.18
Trace Mineral Mix	.09	.09
Vitamin E Mix	.09	.11
Vitamin ADE Mix	.07	.07
Additives	.50	.46

¹ As fed.

² Assumptions:

- a. Composition of trace mineral mix (%) Co - .01, Cu - 1, Fe - 5, I = .06, Mn - 4, Se - .03, Zn - 4.
- b. Composition of Vitamin ADE mix, per pound: A - 2000 KIU, D - 450 KIU, E - 8000 IU.
- c. Vit E supplement contains 20,000 IU per pound.

³ Grower should contain coccidiostat or other additive as desired.

¹ As fed.

² Assumptions:

- a. Heifer weighs 230 lbs., gains 1.8 lbs. per day.
- b. Composition of trace mineral mix (%) Co - .01, Cu - 1, Fe - 5, I = .06, Mn - 4, Se - .03, Zn - 4.
- c. Composition of Vitamin ADE mix, per pound: A - 2000 KIU, D - 450 KIU, E - 8000 IU.
- d. Vit E supplement contains 20,000 IU per pound.

Table 2. Example rations for a 3-month-old Holstein heifer. ^{1,2}	Ration			
	1	2	3	4
Alfalfa Hay, early Bloom	3.4			
Alfalfa Hay, Mid Bloom		2.2		
Alfalfa Silage, early Bloom			3.4	
Corn Silage, 50% Grain		2.9		
Brome Pasture			2.37	9.3
Oats, Rolled				3.7
Corn, Ground	3.3	3.3	3.71	
Soybeans, Roasted	.5			
Soybean Meal, 44%	.41	1.00	.95	.50
Limestone, Ground		.01	.02	.04
Salt	.02	.01	.01	.01
Trace Mineral Mix	.006	.007	.007	.007
Vitamin E	.003	.003	.003	.003
Vitamin ADE Mix	.003	.003	.003	.003

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