

Calving Ease

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Improving Weaning Results: Keeping Weaned Calves Growing and Healthy

Two goals of an effective weaning program for dairy heifer calves are (1) maintaining growth rates and (2) staying healthy. Reaching these goals requires achieving adequate rumen development and providing enough feed. Why does the growth rate drop or plateau among so many weaned calves? Why is the pneumonia treatment rate so high among weaned calves? Why is the failure rate so high?

Rate of rumen development is determined by how we care for our calves.

The facts about rumen development are well established. We provide the young calf with a palatable and digestible solid feed and water. She eats this and fermentation begins to take place in the rumen. The carbohydrates in the solid feed are digested. They release organic chemicals that stimulate changes in the rumen lining. Little fingers (technically called papillae) now cover the inside of the rumen lining. After about three weeks of regular concentrate intake these “fingers” provide enough surface area to absorb many nutrients. And, the rumen is populated with “bugs” that make the fermentation process work well with solid feed.

If the biology of development is so simple how can anything go wrong? Note that fermentation requires both a solid feed (usually calf starter grain) and water. Do we offer free choice water? Frozen water does not count. An empty water pail does not count. A dirty water pail (think of scum, algae) does not count. Calves prefer to drink clean water from a clean pail. And, I have found that the younger calves will drink more water if it is close to body temperature.

The calf starter grain has to be eaten in order to ferment. Anything that makes calves limit their intake also slows down the rumen growth process. For some reason young calves seem to prefer calf starter grain with low levels of fine particles and that is free of mold. Excessive intake of roughage (that is, hay) can also limit starter grain intake although small amounts (up to 10% of total) can be positive.

By offering a small amount of grain that was renewed frequently to my youngest calves I seemed to get early grain intake. This is in contrast to offering a full pail of grain to newborn calves and leaving it to mold. I know that monitoring calf grain pails takes extra labor. However, by watching consumption I was able to keep track of both when calves started eating grain consistently and when they were eating enough grain to start cutting back on their milk ration.

Our level of milk feeding is going to influence the consumption of calf starter grain.

The research literature from the past five years has consistently shown that as milk feeding levels go up the age when calves begin eating calf starter grain also increases. Let me share my personal experience with this. In the 1980's I thought I was doing a good job feeding calves four quarts a day of 20-20 milk replacer mixed at 12% solids. That's about one pound of powder a day. Many calves began nibbling at calf starter grain between 7 to 10 days. By two weeks of age many of them were eating well over one cup of starter daily (about 0.25 pound). My routine was to drop the afternoon milk feeding between 35 and 42 days of age. All calves received free-choice water. Getting grain intake up to four or more pounds per day by the end of seven weeks was easy – many calves were eating more than that.

Then, over a decade later I was feeding a maximum of eight quarts a day of 28-20 mixed at 15% solids. That's a little over two pounds of powder a day. Very few calves ate much grain before three weeks of age. By five weeks at least half of the calves were eating about one quart of starter daily (about 1 pound). Now my routine was determined by watching grain intakes of groups of five calves. All the ones consistently eating at least one quart daily had their afternoon milk intake cut back. Usually there was one calf out of ten that was a laggard – she was slow in coming up on grain. So, her hutch was tagged to get the full PM milk feeding for a few more days until she was consistently eating more starter. My goal was to pull all milk away during the week of 42-49 days of age. Remember I was weaning based on grain consumption. While most calves were fully weaned that week roughly ten percent were weaned later - in the 50-56 day period.

What to do with calves that are not ready to wean?

The most important task as a calf care person is to watch calves closely enough to spot the ones that started eating grain later than the others. They need a full three weeks of consistent grain intake before their rumen is developed enough to efficiently digest solid feed (grain) and absorb nutrients effectively. And, their volume of calf starter grain consumption has to be high enough to provide energy and protein both for maintenance and growth. For a 180 pound calf at 60°F where we want maintain a 1.7 lbs./day gain that means about six pounds of a 18% c.p. starter/grower a day (roughly six quarts volume).

Most of the time I had more calves than hutches. Thus, although I wanted to keep calves in the hutches for a week after they were fully weaned it seemed as though I always had at least ten percent of the calves [I called them “left-back” calves] that were not ready to move at eight weeks. I maintained one row of hutches for these “laggards.” While on the intensive milk feeding program they didn't start eating calf starter grain consistently soon enough to give a full three weeks of rumen development before weaning. Usually it only took an extra week to get them ready to move with the next weaning group. By the way, I liked to get a head start on acclimatizing the rumen for forages. I had a supply of good quality second-cutting alfalfa hay. I put a handful in the top of the grain pails daily for all the calves the last week they were in the hutches.

References: Khan, M.A. and Others “Invited review: Effects of milk ration on solid feed intake, weaning and performance in dairy heifers.” *Journal of Dairy Science* 94:1071-1081 (2011). Quigley, J.D. and Others, “Modeling the effects of liquid intake and weaning on digestibility of nutrients in pre- and post-weaning dairy calves.” *Proceedings of Tri-State Nutrition Conference*, April 2017, pp 33-44.

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