

Calf Notes.com

Calf Note #19 – Does Hay Develop the Rumen?

Introduction. Preparing the calf for weaning means ensuring that it has adequate passive immunity, is kept dry and comfortable, and is allowed access to dry feed to develop ruminal function. After weaning, calves must derive all of their energy and protein from the feed, whether it is starter, grower, hay, silage, or pasture. Thus, the calf's digestive system must be properly adapted - and this adaptation takes time.

At weaning, the calf is forced to undergo several dramatic changes. Consider the following:

- The primary source of nutrients changes from liquid to solid
- The amount of dry matter the calf receives is cut dramatically (up to 50%) at weaning
- The calf must adapt from a monogastric type of digestion to a ruminant type of fermentation and digestion
- Changes in housing and management often occur around weaning which can add to stress.

Effect of Physical Form of the Ration. For many years, producers have fed forage - primarily hay - to calves to promote ruminal development. The common reason was to give the calf the "scratch" needed to start the workings of the rumen. In fact, the development of rumen function is primarily chemical and is caused by VFA in the rumen. Providing forage has less of an effect on ruminal epithelial development, thus on activity and function. The concept of "scratch" to develop the rumen is a myth. However, forage is important to promote the growth of the muscular layer of the rumen and to maintain the health of the epithelium. Rumen papillae can grow too much in response to high levels of VFA - when this happens, they may clump together, reducing the surface area available for absorption. Also, some "scratch" is needed to keep the papillae from forming layers of keratin, which can also inhibit VFA absorption. Therefore, hay should be part of the diet - after weaning. A good recommendation is to wean at 4 to 5 weeks of age and offer hay from 6 to 7 weeks of age. If calves are not weaned until 8 to 10 weeks of age, it may be a good idea to feed a limited amount of hay (1 lb/day) from about 6 weeks of age. However, the amount of hay should be limited to ensure that calves will consume sufficient starter (see below).

There are other reasons to limit the hay offered to preweaned calves. The first is voluntary intake. Most calves do not eat significant amounts of hay if grain is also offered. Therefore, producers feed calves the best quality hay available on the farm, only to have it turned into bedding. Generally, most of intake of hay will occur only after 6 to 7 weeks of age. This is a good time to put hay in front of calves.

Another reason not to feed hay to calves prior to weaning is the energy requirement of young calves. Calves have a high energy requirement relative to their ability to consume dry feed. Therefore, if calves consume significant amounts of hay, their intake of other feeds (i.e., starter) will be limited. This has the effect of limiting intake of starter, which can slow growth. Finally, most hay has too little energy for calves. The energy requirement for calves can usually be met only when calves are

fed high quality milk replacer, waste milk and/or excess colostrum and calf starter. Even good quality legume hay generally has too little energy to support growth of preweaned calves.

After about 6 weeks of age, hay does become an important - in fact, a critical component of the ruminant diet. Feed high quality hay to young calves. Their growth and health will be a direct function of the quality of the feed provided and your level of management.

**Written by Dr. Jim Quigley (17 July 1997).
©2001 by Dr. Jim Quigley
Calf Notes.com (<http://www.calfnotes.com>)**