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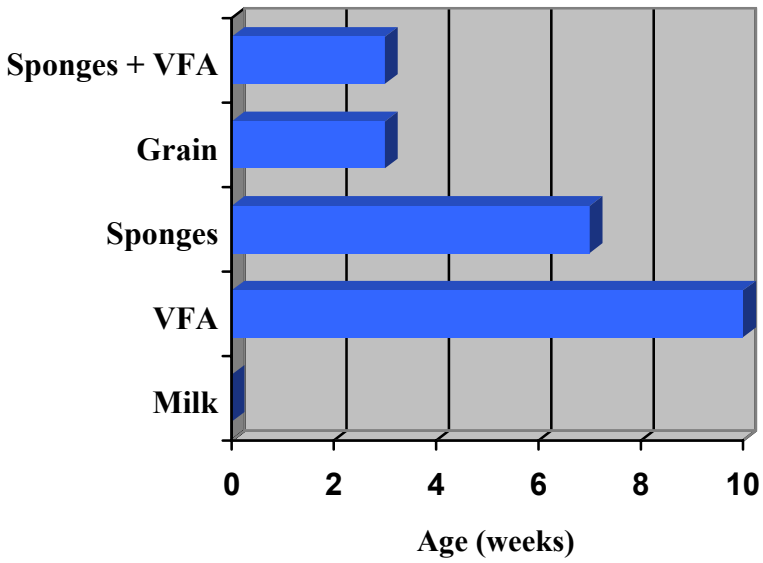
Calf Note #48 – Rumen motility

Introduction

Development of rumen function depends on many factors. One of these includes the ability of the rumen to undergo normal ruminal contractions.

Proper ruminal development requires that material entering the rumen must be able to leave it. Measures of ruminal activity include rumen contractions, rumen pressure, and regurgitation (cud chewing). At birth, the rumen has little muscular activity, and few rumen contractions can be measured. Similarly, no regurgitation occurs in the first week or so of life. With increasing intake of dry feed, rumen contractions begin. When calves are fed milk, hay, and grain from shortly after birth, rumen contractions can be measured as early as 3 weeks of age. However, when calves are fed only milk, rumen contractions may not be measurable for extended periods. Cud chewing has been observed as early as 7 days of age, and therefore may not be related to ruminal development *per se.* However, calves will ruminate for increasing periods when dry feed (particularly hay) is fed.



The figure (from Asai, 1973) shows the onset of normal rumen contractions in response to various dietary treatments in young calves. This research indicates that when milk is the only feed offered to calves, there is little development of normal ruminal contractions. Inserting plastic sponges into the rumen to simulate the effect of forage ("scratch factor") on the development of rumen motility resulted in the onset of rumen contractions at 7 weeks of age. Similarly, when VFA are infused into the rumen (to simulate the "chemical" effect on rumen development), it took 10 weeks for the onset of normal rumen contractions. However, when grain was fed, or when sponges + VFA were placed in the rumen, rumen motility was established by approximately 3 weeks of age. If we assume that calves normally begin to consume dry feed from about 1 wk of age, then it would mean that it takes approximately 2 weeks for this motility to become established.

During the first 6 to 8 weeks of age, the emphasis in calf rearing should be on maximizing ruminal development and minimizing weaning stress. Maximal rumen development will be associated with intake of calf starter. While hay intake IS important to rumen health, it is most important AFTER the first 6 weeks, when development of the ruminal papillae is critical to allow the calf to absorb sufficient VFA to maintain growth.

Proper calf starter intake will allow proper rumen development, including the physical development of rumen contractions. Calf growers can stimulate normal rumen development by carefully managing calf starter and water. This can lead to earlier weaning and better economy for the producer.

Reference

Asai, T. 1973. Japanese Journal of Veterinary Science.1973. 35:239-252.