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Calf Note #47 – Palatability of calf starters

Introduction

An important criteria in promoting economical feeding of preweaned calves is early and aggressive calf starter intake. Naturally, the palatability of the calf starter has an important effect on the initiation of calf starter consumption and subsequent rumen development.

It's important to differentiate among *palatability* of a calf starter, *preference* for a starter and *intake* of a starter. A feed is palatable when it tastes good. Preference is term used to describe which feed an animal likes the most. Preference is often determined by offering an animal a choice between two or more feeds - the one that is consumed in greater quantity (or the one that the animal initially selects) is considered the preferred feed. A feed does not have to be palatable to be preferred. An animal could be offered a choice between a poor tasting feed and one that's just horrible. It will usually prefer the poor feed. On the other hand, a feed might be quite palatable but not preferred over a completely delightful feed. A feed that might lose many preference tests might be sufficiently palatable and consumed in great quantity when the calf doesn't have a choice among several feeds.

There are a number of factors that can affect the palatability of calf starters. These include:

- Flavor agents. These ingredients are often added to calf starters to improve palatability and intake. The most commonly used flavoring agent in starters is molasses. Molasses is added to the mixture before pelleting, or may be sprayed onto a textured feed during the final blending. Sometimes, dried molasses is added to the feed mixture before pelleting. Other molasses substitutes (Ruma-Sweet) have shown promise as flavoring agents for starters.

The amount of molasses added to starters is of some debate. Many manufacturers can add only a limited amount of molasses (5-7% of the formula) to a starter before the handling characteristics deteriorate (e.g., bags turn into bricks when they get cold). Some larger calf raisers that can justify the capital expense mix their own pellets and grain and can add significantly more molasses - up to 10% molasses in their starters. Of course, care must be used in formulating diets to contain that much molasses. Molasses in fermented rapidly in the rumen and should not be used in large amounts when calves are already consuming significant (>2 lbs./day, >1 kg/day) starter. According to the 1989 Dairy NRC, molasses contains 75% DM and (DM basis) 5.8% CP, 72% TDN, 1.0% Ca and 0.1% P, 3.8% K and 0.4% Mg. An important consideration, however, is the speed at which molasses ferments in the rumen. Large amounts of molasses may dramatically reduce ruminal pH due to the rapid fermentation in the rumen. Therefore, molasses should be added to calf starters judiciously.

It is important to differentiate between ingredients or agents that improve intake by improved palatability versus improved performance. For example, providing highly digestible protein sources (e.g., heat treated soybean meal) may not have an effect on

palatability, but may increase intake because the calves grow more and have an improved appetite. Also, calves in good health will consume more starter than sick calves. Many other flavoring agents have been evaluated in starters. Some research has shown improved preference, some improved palatability, and others have shown improved performance due to increased intake. Be sure to look for research data to indicate improved performance when calves are fed the flavor agent of interest.

- Feed form. Most research appears to indicate that calves find textured feeds (feed containing pellets plus whole or processed grains) most palatable. Pelleted feeds are also quite palatable. In fact, some research indicates that calves find pelleted feeds most palatable. Generally, calves will consume acceptably with either form. Either of these two forms are preferred over meal feeds. Due to the dusty nature of meals, calves generally do not find them palatable.

Effect of various feed ingredients on the palatability of calf starters (various references).

Ingredient	Effect
Sodium bicarbonate (>1%)	↓↑
Fats & oils (>3% of formula)	↓
Soybean, cottonseed hulls	↑
Ionophores	↑↓
Yeast culture	↑
Molasses	↑
Soybean meal	--
Corn	--
Sugarbeet pulp	↓
Rapeseed meal	↓
Urea	↓

- Pellet quality and fines. As mentioned above, calves don't like to consume fines - they find them unpalatable. Therefore, they might have a negative impact on intake and overall performance.
- Ingredient composition. Ingredients in a calf starter can have a dramatic effect on palatability and intake. The table indicates some *general* effects on intake - of course, the actual effects will depend a great deal on the actual composition of the feed and other ingredients in the mix. Some research has reported both improved and depressed palatability when certain ingredients are included in calf starters (e.g., sodium bicarbonate). Usually this relates to the level at which the ingredient is included.

Palatability of calf starter is only one criteria for a successful feed. In addition to palatability, the feed must provide essential nutrients required by the calf appropriate for its age. It must be available, fresh and clean. It must be offered free choice for the first 8 weeks of life. Availability of water will also increase calf starter intake. Proper starter feeding will promote rumen development, which will allow earlier weaning and greater economy in calf enterprises.

Written by Dr. Jim Quigley (28 December 1998).
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