

Transition Calves: Introducing Forages

- **Rumen Basics**
- **What happens in the rumen when we add forage to the ration?**
- **What happens if we feed too much forage too soon?**
- **A preferred forage introduction strategy.**

What are transition calves? The “transition” usually refers to at least one and often two changes. One very common change is in housing for calves that have been raised in individual housing (hutches, pens) for six to ten weeks. They “transition” into group housing. The other change is the addition of forage to their ration. They “transition” from a concentrate and water ration to a forage, concentrate and water ration.

Rumen Basics

The digestion of both the concentrate mix and forage takes place primarily in the rumen. Let us assume that the calf has been eating enough calf starter concentrate and water long enough so that she is “rumen competent.” That is, the lining of the rumen has developed papillae for nutrient absorption. And, the rumen wall muscles are strong enough to mix rumen contents.

Essential to fermentation and digestion in the rumen is its microbial population. In bovine ruminants, some of the “bugs” digest rumen contents while others utilize the digested products.

From the concentrate fed to calves they digest and utilize carbohydrates like sugar and starch, protein and fiber. In young calves consuming a milk/milk replacer, concentrate and water ration, this population is oriented primarily to carbohydrates and protein.

These concentrate-oriented microbes release products that are either absorbed in the rumen or used by other bugs. Without the action of these microbes, the concentrate mix would pass through the rumen unchanged into the small intestine. There, the calf would digest the concentrate much like you and I would digest our breakfast cereal. This would be quite inefficient compared to ruminal digestion.

What happens in the rumen when we first add forage to the ration?

What happens in the rumen when we introduce forage to calves that have been on a concentrate ration? Concentrate-fed calves have a very limited microbial population of fiber digesters and utilizers compared to those that break down carbohydrates and protein from concentrates. When there are so few fiber-digesting microbes, most of the fiber passes through the rumen undigested into the small intestine. The small intestine is not efficient at extracting nutrients from fiber. Thus, when we first start feeding forage, most of the forage nutrients are passed by the calf as manure.

Gradually, the necessary fiber-oriented microbial population develops. This is a natural process. But, how long does this take before a calf is efficiently digesting and utilizing forages? A reasonable guess about the shortest length of this adaptation period is at least a week. Because the fiber-digesting microbes are some of the slowest growing of all the rumen bugs, two weeks is an even better adaptation period.

What happens if we feed too much forage too soon?

Let us assume that the calves have been on a milk/milk replacer, calf starter concentrate and water ration. What do we usually observe when forage is added to the ration of these calves? Most calves are attracted to the hay or haylage or TMR. Often, they will consume the forage before eating the concentrate mix to which they are accustomed.

What, then, will happen to the nutrient balance in a concentrate-fed calf if we introduce free choice forage? Remember her rumen is still quite small. The calf fills up on hay and eats half or less of her normal concentrate ration. The concentrate is digested and utilized as usual. For the first week, the hay pretty much just passes through the rumen undigested or only partially digested. What is the calf getting for nutrients? Only about half her normal level or less from concentrate! And, if we are feeding a coccidiostat in the concentrate, we have cut that medication intake in half, also.

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What happens to transition calves fed like this? They experience a big drop in energy and protein. Many of them, due to this nutritional stress, have weakened immunity. Then, they may develop bacterial pneumonia.

A preferred forage introduction strategy

When introducing a forage like hay for the first time to calves, for the first week limit the intake to about 500gm per calf per day. This small amount of hay will stimulate the multiplication of the forage-oriented microbes.

Go slowly introducing hay. Allow the rumen microbial population that digests and uses fiber to build up. If feeding space does not allow all the calves to eat at one time, then it's probably better to limit-feed hay longer – perhaps two weeks or more.

Then, after the calf's rumen is competent for fiber digestion, begin to feed free choice forage along with an adequate amount of concentrate. Most transition-size heifers will need at least 2 to 3kg of concentrate daily just to meet their maintenance needs for energy – even more in below freezing weather.

Many calf raisers have experienced significant decreases in respiratory illness treatment rates by carefully managing the rate at which they introduce forages to transition calves.

What if they have been eating straw?

The rumen bugs tend to be specific to feed stuffs. Thus, the ones acting on straw are not efficient in breaking down grass and legume hay. A one or two week adaptation period will support gains better than abrupt introduction of free-choice hay.

What about pasture grasses?

If we are talking about immature grass intake (compared to mature grasses) introduction to free choice can be made over only a few days. These immature grasses are broken down in the rumen much like carbohydrates and produce a significant proportion of butyrate encouraging further papillae development.

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