Hand-raising a baby animal requires a commitment to providing adequate nutrition, housing, and care to give the newborn the best chance to grow into a healthy, productive adult. This information is designed to help provide a better understanding of generally accepted baby animal management guidelines and how each recommendation benefits the animal. It is not intended to provide treatment recommendations - there is no substitute for sound information from your veterinarian.

WHAT IS A RUMINANT?

Ruminant animals such as cattle, sheep and goats have a complex digestive system composed of four stomach compartments: the reticulum, the rumen, the omasum, and the abomasum. Each compartment has specific functions that help the ruminant animal digest feeds that ***monogastric***, or "simple stomach" animals like pigs and dogs, cannot digest. The ***rumen*** of an adult animal contains a large population of beneficial bacteria that allows it to break the fiber in feeds down to sugars, and combine these with nitrogen to synthesize protein. The rumen also synthesizes essential B vitamins, and produces ***volatile fatty acids*** that are the animal's main source of energy. In an adult cow the rumen can have a capacity as large as 40-50 gallons, with billions of bacteria and protozoa that make up the normal microbial population.

Most domestic ruminant animals don't have predators to run away from any more, but in their evolutionary history they were flight animals, and having a rumen allowed them to eat a large quantity of feed at one time, swallowing it whole, then regurgitate and chew it later when they had the opportunity to stop and rest. The ***reticulum*** (known for its distinctive honeycomb appearance) is attached to the rumen, and serves to help the animal push food back up from the rumen into the esophagus when it regurgitates. The reticulum also helps catch any foreign material the animal might swallow inadvertently. The ***omasum*** (nicknamed the "many-plies" due to its unique, book-like appearance) serves to absorb volatile fatty acids produced in the rumen, as well as water and electrolytes. The ***abomasum*** is called the "true" stomach because it most resembles the single stomach of a monogastric animal. Digestion in the abomasum and the rest of the digestive tract (small intestine and large intestine) is very much like our own digestive system. Proteins and any remaining carbohydrates are broken down in the abomasum, and most of the nutrients are absorbed in the small intestine.

UNTIL THE RUMEN IS DEVELOPED, BABY RUMINANTS FUNCTION LIKE MONOGASTRIC ANIMALS

Baby ruminant animals are born with a very small, non-functioning rumen, and must develop the bacterial population and increase the size of the rumen gradually by eating solid feeds and drinking fresh water that is separate from milk. When young ruminant animals nurse milk, a signal from the brain causes a special flap called the ***esophageal groove*** to close, forming a tube that allows milk to flow directly into the abomasum, bypassing the rumen. Everything the baby ruminant consumes eventually gets to the abomasum, but water and solid feeds go directly into the rumen first, where the bacteria help to digest them before they continue along the rest of the digestive tract.

Successful weaning can only be achieved when the animal is consuming enough solid feed and fresh water to provide adequate nutrition without milk. The animal's ability to digest feeds is dependent on developing the size and bacterial population of its rumen. High-starch feeds like starter grain help the bacterial population grow rapidly, but forage (hay or grass) can actually slow the rumen development process in a very young ruminant. It is also very important that the animal has constant access to fresh, clean water to optimize rumen development – the bacteria need water to grow, and the animal is much more likely to consume the dry feed if it can wash it down with a drink. Starter grain and clean water should be available free choice (as much as the animal will consume) early in life (in the first week of life for calves, second week for most other species). For calves, do not feed hay or grass until the animal is weaned completely off milk. For other ruminant species, allow the animal 1 to 2 weeks to begin consuming starter grain before providing forage.

STARTER FEEDS – QUALITY MATTERS

Starter grain is typically available either as a textured feed with a combination of corn, oats, a protein/vitamin/mineral pellet, and molasses, or may be in the form of a complete pellet. Whatever the form, starter grain should be highly palatable, nutritionally-balanced for the intended species, and free of ***fines***, which are very small particles that can be dusty, and may contribute to respiratory disease or digestive upset. Starter grain should be at least 18% protein, but formulas are available as high as 24% protein. Select a product that is appropriate and labeled for your animal. It is especially important not to feed medicated products off-label, as some medications are approved for some species but not others.

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STARTER FEED AND WATER INTAKE STARTS SLOWLY BUT RAMPS UP QUICKLY

Young ruminants typically consume only a little water and starter feed before two weeks of age. Start by offering a small amount of starter feed to provide enough for the animal to nibble on while avoiding waste. Providing fresh starter feed and clean water in a clean pail every day is the best way to stimulate consumption. Dirty or old starter feed should be discarded and the pail scrubbed and sanitized – bacteria grow rapidly in soiled or damp feed. Closely monitor water availability during hot weather, because young animals can easily become dehydrated if they do not have enough fresh water available.

FOR CALVES, STARTER CONSUMPTION SHOULD DETERMINE WEANING TIME, NOT AGE

Most calves can be weaned from calf milk replacer between 6 and 12 weeks of age, as long as they are healthy and are consuming at least 2 pounds of calf starter each day. A calf that is eating starter consistently can be weaned "cold turkey" or you can reduce the amount of milk fed per day for a short period to promote starter intake and prepare the calf for weaning. A common approach is to cut back to a once-daily milk feeding for 7-10 days before weaning. Remember, the calf must be consuming enough calf starter to support health and growth without milk. It is also best to avoid weaning during other stress, such as transport, vaccination, dehorning, etc., or when the calf is sick.

For other ruminant species, daily dry feed intake is not as important as weight gain and age, as long as they are consuming some grain, hay and water daily. Small ruminants (goat kids and lambs) may not consume significant amounts of dry feeds until after milk is removed completely, especially if they are on a free choice feeding system for their milk. Weaning is usually initiated when they have reached at least 30 days of age, and have tripled their birth weight.

ADDITIONAL RESOURCES

Your livestock veterinarian and local university extension agent are excellent resources for animal management information, as well as many online sources. Please visit the Learning and Resource Center at www.savacaf.com for some helpful online links.

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