HOARD'S DAIRYMAN

Variables for calves other than nutrition

by Al Kertz

WE MOST often think of nutrition when considering how well calves are doing. Yet, there are many non-nutrition variables affecting calf performance. Let's consider some of those major variables.

Calving environment and housing

Disregarding colostrum management for a moment, how contaminated is the calving environment? When a calf is born, does it get a noseful of contaminated bedding? Is the colostrum also contaminated from a dirty udder or equipment used to milk the cow or transfer the colostrum to storage and feeding containers? If the answer is yes to any of these questions, the calf is now likely to have scours within the next two weeks. Studies have shown most scours originate with a contaminated calving environment, and diarrhea is the major health problem and cause of death in young calves.

Calf housing should be dry, clean, and well-ventilated. The degree of bedding dryness can be deceptive. In a study of Wisconsin indoor calf facilities, the average bedding moisture was 50%. That might pass the "wet knee" test, but it is not good for calves. This is especially true in winter when the wet bedding wicks heat from the calf. This also adds to the calf's high energy requirements due to cold weather.

A clean environment lowers microbial presence. Ventilation rate should be at four air exchanges per hour in calf housing. While we do not want drafts, more moisture in the air increases bacterial loads. Therefore, air needs to be exchanged without creating a draft. The late Ken Nordlund at the University of Wisconsin developed positive flow ventilation systems for ideal air exchange in calf housing.

Seasonal factor

Calves have a zone of thermal neutrality from 59°F to 79°F. Within this temperature range, they do not need to use additional energy to keep cool or stay warm. Factors that affect this range include hair coat length or matting, as well as humidity, which has a greater effect at higher percentages. We know more about cold weather effects with calves; however, recently more heat stress studies have been completed.

A big factor in cold weather is starter intake and its fermentation, which produces heat. That is why all large animals that have adapted to survive winter without hibernating are ruminants. That "internal furnace" produces even more heat when feedstuffs are fibrous. So, the sooner calves begin to eat more starter — and a well-textured starter is best for optimal rumen fermentation — the sooner calves can benefit by the heat of rumen fermentation. In cold weather, the use of calf blankets for the first 2 to 4 weeks of age can be beneficial.

In hot weather, the first need is for shade. Fans can help mitigate the effects of stagnant air, which amplifies bacterial load with greater humidity. I once saw this go too far in a tropical country. A dairy had a tunnel-ventilated calf barn and calves were in metal bar crates with no bedding. I suggested that they turn down the fan, especially since the calves had no bedding to lie down on to get protection from the fan wind speed.

Handling and movement

Just like human babies, calves are very sensitive to change. Rough handling is stressful to them. When this occurs before or during colostrum feeding, the stress reduces antibody absorption. I was asked once by a calf and heifer grower to visit two dairy farms from which he sourced calves. The calves from one dairy did not do well compared to the other. I was only able to visit the farm where calves were higher performing. When I finished my evaluation, I asked the calf manager if she knew why calves did not do as well at the other dairy. She said simply, "Because they pull every calf."

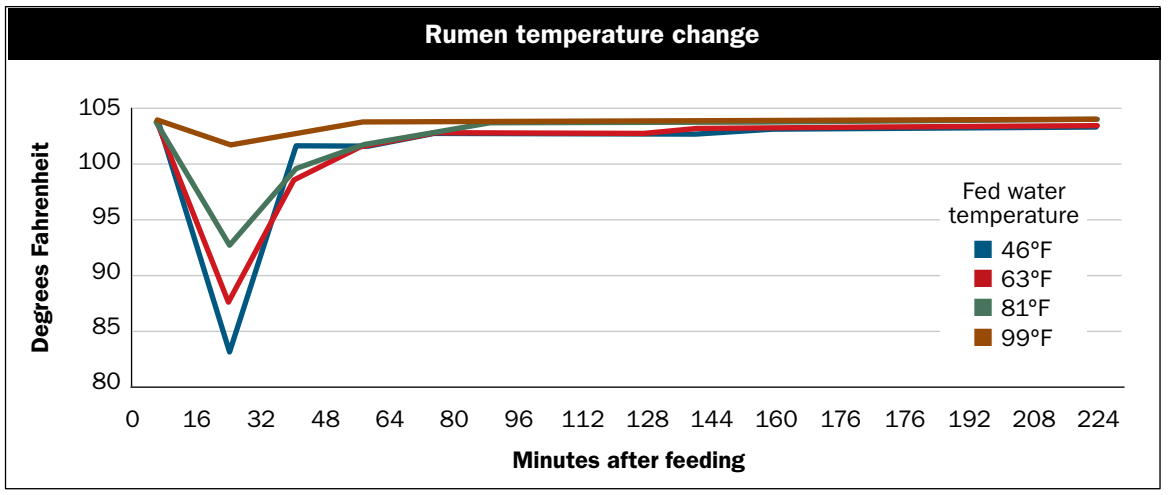
Additionally, any movement of calves after birth is a stress as well. That movement should be as gentle as possible. The further the distance and time of that movement, the greater the stress.

Water

Admittedly, water is a nutrient and needed in the greatest quantity in a calf's daily diet. Yet sometimes it is provided miserly — as if it had a great value — or as if it had little value. The fundamental relationship here is calves need to drink about four times as much water as starter intake. By limiting water intake, you limit starter intake and, subsequently, growth. Years ago, I did a study in which I saw this relationship and another factor related to it. If calves have water and starter containers side-by-side with no real physical separation, several things will happen. Calves dribble water into starter and starter into water. Calves do not like wet starter or dirty water. That will consequently reduce intake of both and daily gain. Therefore, make sure water and starter containers are separated enough by distance or a divider so that calves cannot contaminate back and forth.

Other practical elements of feeding water are based on season. Do not let water run out, especially during hot weather. Have a protocol where water containers are periodically checked and refilled as necessary, or dumped if dirty and refilled. Do not use black buckets in hot sunny weather, as water may become too hot for the calves to drink.

In cold weather, feed warm water. If the weather is cold enough that water freezes, this may further support warm water. This may also mean adding a third warm water feeding at another time outside of milk feeding. Calves will learn to drink water before it freezes. Warm water is key not only to delay freezing before calves drink it, but because calves and cows prefer warm water as it does not greatly disturb rumen temperature. The graph shows how much calf rumen temperature was affected by drinking water temperature. The colder the water, the more rumen temperature dropped, and the longer it took to return to normal. Calves and cows realize this change regardless of ambient temperatures.



Some may think calves have less need for water in winter as air temperature and humidity drop. When calves breathe this colder, drier air, they warm and humidify the air in their lungs before expiration, which is when you can see their breath. With every breath, calves lose body water that needs to be replaced.

There are other non-nutrition factors that may be of lesser impact than those addressed here — for example, calving difficulty and individual versus paired housing. But addressing calving environment, housing limitations, seasonality, and handling and movement of calves are key. Then, look at how water is provided and managed.

■ The author is the executive vice president of the American Registry of Professional Animal Scientists (ARPAS). Learn more at www.arpas.org.

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