

Calf Bedding: An Investment in the Future

It's a shame that calves don't come with owner's manuals. If they did, right after the part about calving into a clean pen and getting good quality colostrum into her, you would come to the part about the three things every calf needs to do once she's up and running: maintain body temperature; grow; and stay healthy in the presence of pathogens. It's important to remember that each of these three functions requires a certain amount of energy, and that if energy is limited, she will use all available energy for maintenance first, then growth, then immune function. Given that calves are the most efficient energy converters on the farm, it's always frustrating to see the remarkable potential of these efficient little creatures being lost to easily corrected management practices. The point of this article is to remind producers that money spent minimizing the lost growth and health of their calves isn't a dead cost, but an investment – and a very good one.

Granted, raising calves has never been easy. Historically, calves have had three strikes against them, two of them man-made. The first strike is physiological – calves have a high ratio of surface area to body mass, and they are born with little in the way of

body fat reserves. So, whatever heat they generate for maintenance they can easily lose through convection (heat loss through the air) and conduction (heat loss through their beds), and, once lost, calves have very little body fat they can burn to replace that heat. They have to rely on dietary energy.

This brings us to strike two. Too many calves, especially in the cold months, simply aren't fed enough for maintenance, let alone growth. This is compounded by the previously mentioned "energy hierarchy" at work inside a calf: maintenance needs come first, growth is second, immune function third. If calves are short on dietary energy, growth is slowed or even stopped, and immune function is weakened, because all the energy coming in is being used just to keep the calf warm. Here's an example: a calf given two 10 oz. feedings a day of a 22/20 milk replacer with 10% ash content is getting 2,517 calories of energy. At an ambient temperature of 30°, according to NRC guidelines, she needs roughly 2,600 calories *just for maintenance*. This calf isn't growing, and she's also more susceptible to pathogens. Maintenance requirements range from about 1,750 calories a day when calves feel no cold stress, to 3,500 calories a day at -10°. That's the energy it takes just to stay warm. But we're not just trying to keep calves

warm, we're trying to keep them growing and healthy, which requires even more energy.

Strike three, like strike two, is also man-made. The above example of energy requirements at different temperatures doesn't factor in the effects of cold drafts or wet beds. A calf's environment can offer many ways for her to lose heat in the colder months, slowing growth and impeding immune function. As mentioned earlier, calves always lose heat through their beds, called conduction, and through the air, called convection. Minimizing these "heat sinks" can allow calves to grow and stay healthy even in the coldest weather.

Minimizing heat loss through both conduction and convection is best accomplished by making sure calves have plenty of clean, dry bedding. If

possible, there should be enough long straw for the calf to "nest".

Ideally, you shouldn't be able to see the calf's legs when she's lying down, which is 75-80% of her day! (See Picture 1) This straw



Picture 1: This straw is deep enough for calves to nest in, a good rule of thumb is you do not want to be able to see their feet when the calf is standing up.

should be put on top of a 4-6" layer of shavings or sawdust to wick away urine. Remember two things - about 80% of the liquid fed to a calf comes out the other end, and that heat transfer is 60% greater through a wet bed than a dry one. This is especially important to remember with calves on accelerated programs. They drink a lot!

If straw isn't an option, calves still need a good, thick bed of absorptive material to minimize conduction. (See chart). Loss to convection can be lessened by arranging big or small square bales within a pen in an "L" shape, or on the perimeter of a group of hutches, essentially making a windbreak. In large group pens, you may have noticed calves lying along the perimeter of the pen. (See picture 2)

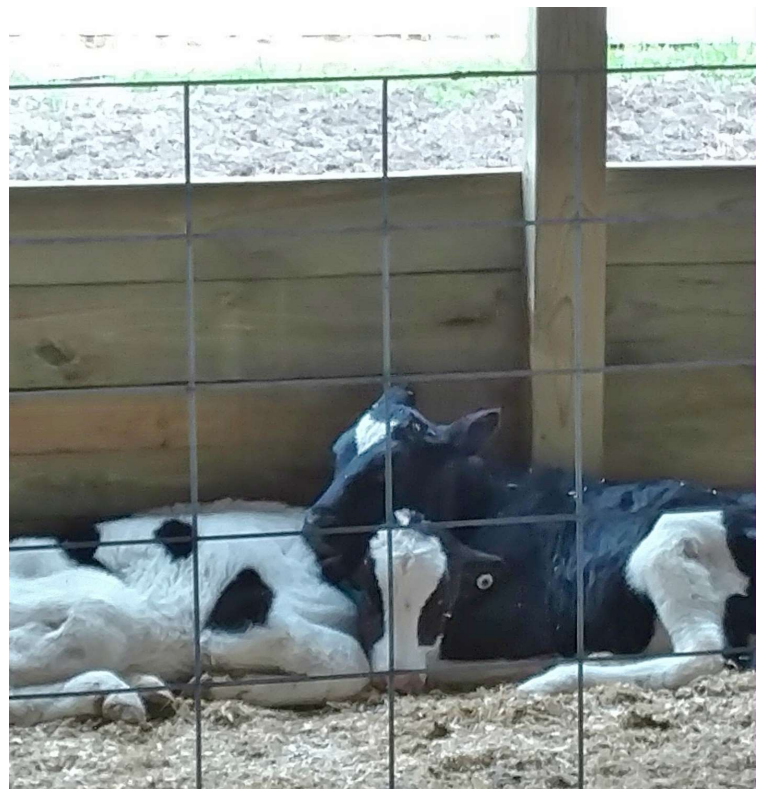
Chart:

Water Absorption of Bedding Materials

Material	Pounds of water absorbed per 100 lb of dry bedding
Sawdust	
Top quality pine	250
Run-of-the-mill hardwood	150
Wood shavings	
Top quality pine	300
Run-of-the-mill hardwood	150
Wood chips	
Top quality pine	300
Run-of-the-mill hardwood	150
Tree bark (dry, fine)	
	250
Wheat Straw	
Long	220
Chopped	295
Oat straw	
Long	280
Chopped	375
Oat hulls	
	200
Corn stover (shredded)	250
Corn cobs (crushed or ground)	210
Barley straw	210
Hay (mature, chopped)	300

Adapted from [Antoniewicz](#), 2006. (2)

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Picture 2: These calves could benefit from a straw bale barrier in the cooler months, as they like to lay against this perimeter wall.

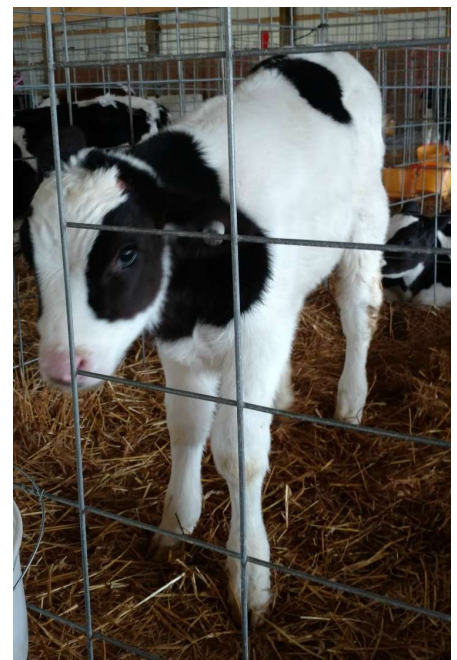
This is partly prey animal behavior, and partly a means to stay out of a draft. If calves are lying against a steel or concrete wall, arranging straw bales against the wall creates a slightly warmer micro-environment. In cold weather, calves really like to lay up against these bales in a group.

Finally, a calf's coat keeps her warm by trapping warm air immediately next to her skin. A dry calf will attempt to stay warm in cold weather by fluffing out her hair, creating a larger warm air space around her. This can't happen when the hair is wet or matted with manure.

(See Picture 3) A wet calf has to burn more dietary energy just to stay warm, energy that should be going toward growth and immune function.

We can't do much about the first strike calves born into cold weather have against them. A calf is just a little bag of bones that needs all the help we can give it. We can, however, do a

great deal address the other two strikes. Feed them all they need, and keep them as dry and draft-free as possible. Keeping your



Picture 3: The straw in this calf's pen is clearly wet, and you can see the matting of the hair on his hock.

calves warm and dry isn't just a primary imperative of good husbandry, it's money in the bank.

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George joined NRV's team in 2015, after 24 years as a Dairyman and 7 years as a dairy nutritionist. Having worked as a dairyman, George has a great understanding of how dairies operate and how to make changes that will positively affect their bottom line. George services many of the North Eastern States, spending the majority of his time in his home state of New York.

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