Good calf growth in cold weather

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Below freezing weather provides good calf growing conditions as heat stress is absent and pathogen survival and growth in freezing conditions is poor. In cold weather conditions calves have a great opportunity to grow without these stresses and they are eager to eat every day. Year after year best rates of gain in winter weather have been achieved.

Calves are basically cold weather creatures. The temperature at which they use no energy either to warm or to cool themselves is called 'thermoneutral'.

For newborns that temperature is about 60°F. At one month of age this thermoneutral value drops to about 30°F. Thus, as they mature through the preweaned weeks they become more comfortable with freezing weather.

The need for energy

The limiting conditions for winter time growth are adequate energy and water, 70% of new growth for a calf is water. As she begins to eat starter grain in addition to milk or milk replacer, more water than that provided by milk is essential for efficient growth.

Energy is the other major limiting factor. Energy used for keeping the calf alive increases as body size increases and as temperatures go down. In Fig. 1 the blue bars show the amount of maintenance energy needed for an 80lb calf (on the left) and a 100lb calf (on the right).

The reason for three bars for each size calf is to show the influence of temperature on the amount of energy needed for maintenance. Looking at the 80lb calf on the left, note how the blue bar goes up as the housing temperature goes down from 50 to 30 to 10°F (10 to -1 to -12°F).

The solid black line that runs from left to right at four quarts of 20-20 milk replacer daily shows the energy available from that feeding rate.

Only at 10°F does the blue bar go above this solid black line. The weather has to get very cold to put an 80lb calf into a negative energy balance for maintenance. Of course, this assumes that this size calf eats all four quarts daily.

But, notice that when we combine both the blue and red parts, the tops of all bars are above the solid four quarts per day line.

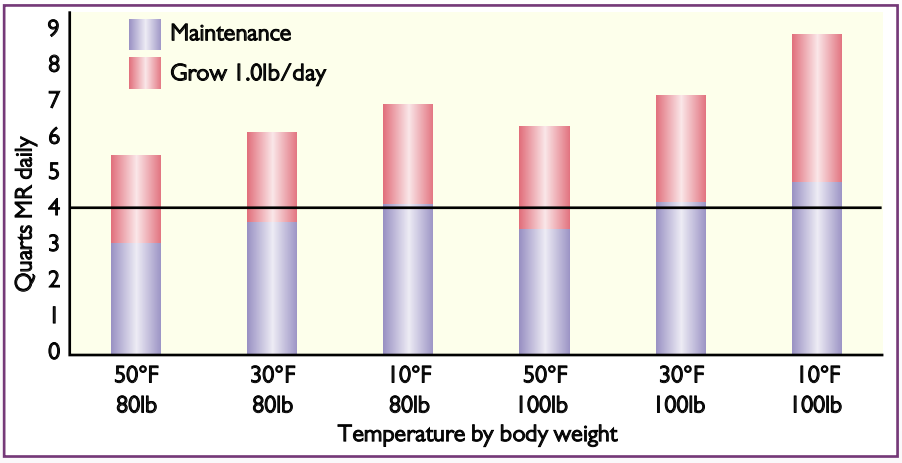

Fig. 1. Quarts 20-20 MR daily by temperature by size for 1lb gain per day (S. Leadley, 2006).

If we want these calves to gain one pound per day, they will have to eat more than the amount provided in four quarts of 20-20 milk replacer a day.

Look at the bars for the 100lb calf. As soon as freezing temperature arrives, she lacks enough energy from the four quarts a day feeding to even meet maintenance needs.

That means she will start losing weight as she robs her body tissue to keep warm. And, note that this assumes that she is dry and housed in a draft free place.

The amount needed for this larger calf to grow a pound a day in addition to maintenance is shown in the red part of the three bars on the right.

Even at 50°F when fed just four quarts of 20-20 milk replacer daily this 100lb calf is not going to gain even close to one pound a day.

In rough winter weather, this is one of the calves that is likely to lose a lot of weight and have pneumonia. These calves respond poorly to antibiotic treatment for respiratory illness because they have no body reserves to combine with the medicine to mount a defence against the bacteria.

The bars in Fig. 1 tell us the plain facts about cold weather feeding and gains. Feed too little and calves not only will not gain, they will have trouble surviving.

Feed enough and calves will thrive like no other season of the year.

Five ways to feed energy

Calves grow very well in cold weather. Naturally, they need a good start with plenty of good quality colostrum as soon as possible after birth. Body reserves at birth are very limited.

Thus, the first feeding of colostrum provides essential energy for survival. Several feedings of colostrum or high fat transition milk are very desirable in freezing weather.

Our challenge as calf raisers is to work out some plan on our farms that will get extra cold weather energy into calves.

If we want calves to grow and build strong immunity, they must have plenty of energy for growth as well as that needed for maintenance.

When freezing weather conditions absorb a lot of energy calves often fall short of the nutrients needed for healthy growth.

Whole milk

How can we increase the amount of energy fed? If you have access to transition milk that is an excellent feed because it is about 16-18% dry matter. Whenever it was available,

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it was fed to the calves under a week old. Especially in freezing weather, they thrived on it because of all the extra energy.

If you have whole milk available, replace all or some milk replacer with milk. Holstein milk has about 25% more energy than 20-20 milk replacer. Jersey milk is higher at 50%.

Please be careful about using waste milk, however. If fed immediately after milking, it could have an acceptable level of coliform bacteria for calves.

If it is held without refrigeration for more than two hours it could have high levels of coliform bacteria leading to unacceptable rates of scours and respiratory illness, reduced rates of gain and even death.

Keep in mind also that unpasteurised waste milk, depending on your herd's health situation, could be the route for infecting calves with salmonella, mycoplasma or Johnes.

Feed more of the same

Another practical way to increase energy levels is to stay with the same milk replacer but just feed more of it. When 20-20 milk replacer is mixed according to tag instructions it can be fed in winter conditions up to 3.0 or 3.5 quarts per feeding twice a day.

Calves will make more efficient use of this feed and begin eating starter sooner if free choice water is offered at least once a day. Offer water even when the weather is below freezing. More and more farms are working out schedules to feed water in winter time. Lots of them fill water pails once a day and, before it freezes solid, dump pails once a day.

Add milk replacer powder

Some farms that feed free choice water all year round choose to increase the dry matter content of their milk replacer in freezing weather. Without free choice water I never had much success increasing dry matter content of milk replacer.

As you mix in more powder for the same amount of water it is possible to offer mixes up to 15-18% dry matter. For example, using 10oz of powder per calf per feeding rather than eight increases the energy level by 25%.

These mixes contain a lot more energy per quart. This method works well for young calves that have free choice water daily.

Add an extra feeding

For several years, when the labour situation was just right, in the winter a mid-day feeding for all the calves less than two weeks old was added. This is a relatively small proportion of the total calves on milk so it was workable.

We were already working with all the calves at that hour feeding them water. So, the extra milk was not much extra work.

The calves were fed by size one extra quart to average size calves and two quarts to the largest ones (100lb and up). There were no problems with scours and it reduced any problems with respiratory illness in this age group.

Add extra fat

Some farms do not want to change their feeding procedures between summer and winter, but may wish to increase the fat content of their ration. One way to do this is to purchase a special 'winter' formula milk replacer such as a 20-27. This provides the extra energy as fat without having to add it as a separate step. In situations where feeding has to be limited to 2.0 or 2.5 quarts of milk replacer per feeding, this has worked well.

The other method is to add fat separately, for example, Merrick's Super Calf Kit. There are others available. Ask your milk replacer supplier. It works well to increase energy. However, it is an extra step at milk replacer mixing time. Only a small amount is used per calf at each feeding. Therefore, purchasing a sturdy bucket to store a product like this in order to maintain product quality once a bag has been opened is recommended. ■

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