

Addressing the F.L.A.W.S.S in Calf Management and Implementing Changes with the Cooler Weather Approaching

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Feed, light, air, water, space and sanitation, also known as F.L.A.W.S.S, is a management practice producers can implement every time they step foot in their barn. This is especially important now, with the change in seasons. It is well known that the effort put into raising good quality calves will pay off in the long term, producing heifers with higher milk production, improved reproduction and overall increased health.

Feed:

Scheduled feeding should start from the minute the calf is born. The calf should receive 4 liters of good quality colostrum, which is rich in nutrients and antibodies, within 6 hours of birth. This should be followed by another 2 liters within 8 hours of birth. A brix refractometer is a readily inexpensive tool that can be easily used on farm to measure colostrum quality. A reading of 22% is the cut off point. Any colostrum with a reading lower than 22% should not be fed to newborn calves. A step-by-step guide to measuring colostrum quality can be found at Calcare.ca. In addition, colostrum samples can be tested for bacterial counts. Bacterial counts should be less than 100,000 colony-forming units per millimeter (cfu/ml). Producers should contact their veterinarian about which colostrum quality-testing methods would best suit their farm. Ideally calves should receive 8-9 liters of milk per day. At 5 days of age, calves can be introduced to a highly palatable and good quality starter feed. This starter feed can be provided free choice. The transition from a milk-based diet to solid feed should occur over several weeks, allowing for the development of the rumen. Calves should be fully transitioned to a solid feed diet by weaning. Calves less than 3 weeks of age will redirect their energy towards heat production instead of growth at temperatures below 15°C. The temperature threshold increases to 5°C for calves over 3 weeks of age. Therefore, with colder temperatures approaching us, calves should be fed 2% more for every degree below 5°C. Instead of increasing the amount per feeding, it is best to increase the frequency of feedings per day. Recommendations for additional feeding requirements during colder weather can be found in the chart below.

Additional Feed Requirements Needed by Calves During Cold Weather

Temperature °C	50 kg calf; under 3 weeks Additional Milk Replacer (Litres)	50 kg calf; over 3 weeks Additional Milk Replacer (Litres)	75 kg calf; Additional Milk Replacer (Litres)	Weaned calves; Calf Starter or Grain Mix (Kg)
20 °C	0	0	0	0
10 °C	1	0	0	0
0 °C	2	1	1.5	0.5
-10 °C	3	2	3	1

*20% protein, 20% fat Milk Replacer mixed at 125g per litre, (Adapted from NRC 2001 Nutrient Requirements for Dairy Cattle and 1996 NRC Nutrient Requirements for Beef Cattle)

Source: OMAFRA - http://www.omafra.gov.on.ca/english/livestock/veal/facts/info_colder.htm

Light:

All calves should have access to adequate light. This is important for being able to find food and water sources, in addition to visualizing their herd mates.

Air:

Providing adequate ventilation through sufficient supply of fresh air while maintaining heat in the barn can be a juggling act. Good ventilation plays a critical role in keeping calves healthy and decreasing the prevalence of pneumonia in your calf rearing areas. While providing fresh air is necessary, it is important to keep in mind that calves should be kept in shelters that protect them from the wind and drafts. The thermoneutral zone is the temperature range in which calves do not require additional energy to maintain their internal body temperature. For calves less than 4 weeks of age, the thermoneutral zone is between 10°C-25°C. For calves between 4 weeks of age and weaning the thermoneutral zone is 0°C-25°C. Temperatures beyond the lower cutoff means the calf requires extra energy to keep warm. Some tools used to keep calves warm during the winter months include calf blankets and deep bedding. Signs that your calf is cold include increased respiratory rate, shivering, raised hair, cold extremities and lower internal temperature. The normal internal temperature of a calf can range between 38.5-40.5°C. Air quality is also impacted by the quality and frequency of bedding. Damp bedding will cause calves to chill more quickly and can result in high ammonia levels, which is irritating to the calf's eyes, nose and throat. High ammonia levels can also make them more susceptible to developing pneumonia. Producers interested in learning whether they have adequate ventilation for their calves can contact their veterinarian to learn more about different tests used to measure ventilation.

Water:

Water is the most essential nutrient for an animal, especially a growing calf. It is the cheapest nutrient, however often the most overlooked especially in the winter months. Good water intake is associated with better average daily gain, feed conversion and healthy digestion. A study done by Kertz et al. found that calves deprived of water had reduced weight gain and consumed less starter feed. Table 2 highlights the benefit of providing ad libitum water to calves and the effect it has on daily gain, consumption of starter feed and duration of scours. Calves that are not provided with adequate water will have decreased growth rates and poor immune function, making them susceptible to harmful pathogens. In the winter months, regularly providing warm water to calves will help calves maintain a normal internal body temperature.

Table 2: Impact of free choice water on calf performance

	Water	
	Free Choice	None
Daily gain (grams)	309	180
Calf starter intake (kg)	11.8	8.18
Scour days per calf	4.5	5.4

Source: OMAFRA- http://www.omafra.gov.on.ca/english/livestock/veal/facts/info_extra.htm

Space:

Stocking density is an important factor when housing calves in group pens. High stocking density results in increased competition for feed and water sources, increased requirement for cleaning pens, and weaker calves having lower average daily gains and becoming more susceptible to disease. Group pens can range from three to eight calves depending on pen size. In accordance with OMAFRA guidelines, pre-weaned calves (less than 6-8 weeks of age) should be provided with 1.5-2m² of space per calf.

Sanitation:

A key factor to starting calves off right is providing them with the optimal environment. Prior to each calving the maternity pens should have fresh deep bedding. Ideally pens should be washed and disinfected after every use to reduce transmission of pathogens. From the maternity pen, calves should be placed into a clean hutch or pen. It is important to consider the pathogens that are not visible to the naked eye. Although your calf hutches or pens may look clean there can be a lot of harmful pathogens hiding in cracks and crevices. Cleaning with hot water, soap and a disinfectant will help to reduce the pathogen load. Thorough cleaning of calf feeding equipment is also important to ensure high bacterial counts are not introduced into the calf during feeding. Increased bacteria can impact the ability of the calf to absorb antibodies. Initially, the milk bottles and nipples should be rinsed with warm water. Next it should be washed with hot water and soap and be allowed to dry prior to the next use. In addition, feeding equipment can be rinsed with a bleach or acid solution. Any bottles with cuts or scratches should be discarded, as this is an ideal spot for bacteria to grow. Performing thorough cleaning and disinfection can be challenging in the winter months. However having a designated area inside to perform proper cleaning will help ensure your calves have an optimal start.

The winter months are approaching quickly, but there is still time to analyze your calf rearing facilities and assess the F.L.A.W.S.S. Producers can discuss any of the F.L.A.W.S.S. factors with their veterinarian and the impact it can have on their herd.