Dairy Cattle Management: Calf Care from Birth to Weaning

Calves are invaluable to the dairyman. Not only are they the primary catalyst for lactation to commence in the adult cow but calves are the major source of replacement animals for the dairy herd. A healthy dam and a healthy pregnancy should produce a healthy calf. From birth onwards the responsibility lies with the farmer to ensure the calf survives and develops. Most calves are completely weaned (from milk) between 6-7 weeks old.

Housing environment
The maternity and the calf pens should be well ventilated to minimise humidity. High humidity is conducive to the proliferation of bacterial, fungal, and viral pathogens. The area should be disinfected, cleaned, and dried before introducing the dams. Place the calves in individual pens after separation from the dam can limit disease transmission between calves. The recommended size of an individual calf pen is 25 sq ft (2.3 sq. metres). Pen height should be about 5-6.5 ft (1.5 m - 2 m). The calf should be able to lie down and get comfortably in the pen. It must be equipped with feeding and watering infrastructure. This should include grass racks and containers to hold supplemental feed and mineral licks. It is important not to place equipment at a height where contamination with urine and faeces may result.

The floor of the calf pen may be solid or slatted (raised). The slatted floor will allow faecal material and urine to pass through thereby minimising contact of these elements with the calf. Slat width should be about 4 inches (10 cm) and gaps between slats should be about 0.75 inch (20 mm) to minimise discomfort to the calf when standing or walking. Solid floors should allow for adequate drainage and should be lined with a suitable bedding material.

Post natal care
After calving, it should be ensured that the newborn is breathing properly and the weight taken. The weight of the calf may be indicative of the nutritional status of the dam, the quality of the site and may also serve as an indicator of the calf’s chances of survival. Lower birth weights usually mean reduced chances of survival. Allow the cow to clean the calf by licking it and remove the afterbirth to prevent the cow from eating it. The umbilical cord of the calf should be dipped in a tincture of iodine (2-5%) or other approved disinfectant to prevent infection. This should be done after cutting it to about 3 inches (7.8 cm) from the body of the calf.

Feeding
One of utmost importance is availability of colostrum (first milk) to the calf. It contains antibodies that the calf needs to compensate for its developing immune system. The percentage protein and Vitamin A is also much higher in colostrum than in normal milk, both of which are of immense benefit to the young calf. Weak calves may need to be guided to the teat of the dam. The best quality colostrum is received from the dam within the first 6 hours after calving. This matches well with the most effective absorption period in the intestine of the calf. The intestine of the calf can no longer absorb the antibodies contained in colostrum 24 hours after birth.

At times, colostrum may not be available such as when the dam dies or when the four quarters of the dam’s udder has mastitis. When this occurs, good quality colostrum collected from other cows and replacing excess can be used. This colostrum can be stored in plastic bags in a freezer for a period of not more than 3-4 months. Colostrum stored for more than 4 months may not contain the necessary antibodies to deal with the present day

References
pathogens. When selecting colostrum to be stored for future use, the use of a colostrometer to measure the specific gravity of the colostrum (which should be greater than 1.106) is vital.

The frozen colostrum should be thawed by immersing the plastic bag in lake-water warm water before feeding to calves twice daily, in teat buckets. Do not use a microwave or hot water, as this rapid thawing will destroy proteins. Teat buckets are preferable to the conventional buckets as they allow the calves to imitate the horizontal sucking behaviour performed on the dam’s teat. This action allows the closure of the oesophageal groove, where milk bypasses the rumen and the incidence of scouring is thereby reduced. Most calves will consume about 9-13 lacs (4.6-kg) of milk per day.

You can also use a colostrum substitute by mixing the following ingredients:

- Whole milk - about 10% body weight of calf
- 20 cc cod-liver oil or 3-4 fresh eggs - source of vitamin A
- 2 oz (57 ml) castor oil - laxative effect

When using a colostrum substitute, you should still monitor the calf for any signs of disease, as the antibiotic effect in this mixture is limited.

If calves are to be separated from the dam, they should be placed in individual calf pens. In communal calf pens, calves may attempt to suck each other thereby ingesting hair balls or boluses which will cause digestive upsets leading to scouring.

Some systems advocate the immediate separation of the dam and calf at birth while others promote the separation 3-4 days after birth. Weaning the calf shortly after birth increases the likelihood of the cow suffering retention of foetal membranes. Recent research found that calves separated from their dams at 2 weeks after birth (late separation) gained weight more rapidly from birth to 14 days as compared with calves separated one day after birth (early separation). The late separated calves maintained this weight advantage until at least 4 weeks old. More importantly, although the milk yield from late separation cows was lower than that of the early separation cows up to 14 days after birth, the late separation cows recovered after weaning such that the total yield (days 4-150) of the 2 groups did not differ significantly.

Buckets used in feeding calves should be seamless stainless steel or plastic. Seamed buckets will be more likely to harbour harmful pathogens.

Where nipple pails and buckets are used they should be washed and sanitized before and after each feeding. Calves should be fed milk up to an average of 10% of their individual body weight per day. The time of feeding should be kept constant. The temperature of milk should be kept similar to that of the calf’s body temperature.

Calves must also be offered forage and some concentrate from birth onwards. Although the consumption of these feedstuffs may be limited in the early life of the calf, they are necessary for proper development of its digestive systems. Forage in particular is important for the creation of stable rumen conditions and a high and relatively constant rumen pH, thereby avoiding any nutritional disturbances such as bloat or scouring.

Calf starter rations should have a high crude protein content and should meet or exceed recommendations expressed in Nutritional Requirements of Dairy Cattle.

Water

Water has no nutritive value but its availability is essential to the sustenance of life. It may even be considered more important than food. Water is lost from the calf through urine, faeces, sweat and evaporation through the lungs (expired air). Among the many benefits of water, it also helps to maintain body temperature and aids in the transportation of nutrients and removal of waste products from the body.

Water intake depends on the food intake, the nature of the diet, physiological state of the animals and ambient temperature.

Clean, fresh and cool water should be available to the calf at all times from birth onwards. During the first week of life the calf will obtain water mainly through milk or milk replacer. Nevertheless, it is recommended that water be provided free choice to calves receiving liquid diets to enhance growth and dry matter intake.

Two systems of feeding are:

1. Nurse cow system

In this system the calf is allowed to run with its dam until weaning at 6-7 weeks old. This is better suited for beef herds but not for dairy where the milk is even more valuable for human consumption.

2. Artificial Rearing system

In this system the calf is separated from the dam after the colostral period (up to one week after birth) and offered one of the following diets up to 10% of body weight:

- Whole milk
- Skimmed milk (this is commonly used where it is available cheaply. However, because skimmed milk has less energy and vitamins such as A, D, E and K some supplements will have to be provided.
- Milk replacer (replacement): A good milk replacer should have a fat content of about 12-15% and a crude fibre level of more than 18%. In addition, the carbohydrates should consist of milk sugar (lactose) and not of starch, as young calves cannot digest starch well. The milk replacer should not be deficient in any nutrient present in the whole milk. It should be palatable to calves and enable them to achieve similar growth rates (if not better) to that obtained if fed whole milk. Be sure to follow the manufacturer’s instructions. This is an economic undertaking and as such, the cost per gallon of milk replacer should not be higher than the cost per gallon of whole milk.

Water intake is maintained up to about 4 weeks old and then gradually withdrawn up to week 6-7. Conversely, the quantity of solid material offered should be gradually increased. This is necessary to attain complete weaning of the calf at 6-7 weeks old. It appears that once the maintenance requirements and gut fill are met by the milk portion of the diet, the calf is not inclined to eat solid feed.

Health Care

Disease prevention is always better than cure. The most common disease occurring in calves before weaning is scour (diarrhoea). Calf pneumonia may occur albeit to a lesser extent.

Calf scour

Calf scour occurs at any time up to the first 4 weeks of life. There are 2 types of scour: 1. Infectious caused by bacterial, viral or protozoan agents and 2. Non-infectious caused mainly by abrupt or sudden changes to the feeding programme or the feeding of a poor quality milk replacer and/or other feeding of calves. Non-infectious scour can predispose a calf to the infectious form.

Symptoms vary with the causative agent. Some of the more common symptoms include severe dehydration, high fever and watery faeces sometimes tinged with blood. Other symptoms are reduced feed consumption, reduced growth, weight loss and restlessness. Death may occur within 24-48 hours.

Causative agents can enter the neonate through the umbilical cord. Disinfecting the navel cord with a iodine solution immediately after birth should prevent this occurrence. This measure will also prevent infection of the navel area by other bacteria such as Staphylococcus spp. and Fusiformis necrophorous, which causes the navel or joints to swell (navel or joint ill). Maintaining a clean, dry environment will minimise the incidence of scour and navel ill. Vaccines against scour are available, particularly for causative agents that are viral in nature, and are administered either to the calf soon after birth or to the pregnant cow. Always consult a veterinarian before administering vaccines.

All infected calves should be isolated and treated. Oral treatment is available for remedying the dehydration and electrolyte loss. Severe dehydration will necessitate the administration of intravenous fluids under the guidance of a veterinarian.

The following is an example of a treatment solution for scour:

1 cup mixture of glucose
1 teaspoon sodium chloride
1 teaspoon bicarbonate of soda
2 litres water

Mix all components and administer to calves at the following rate: 4 litres/4.5 kg body weight over 24 hours divided into 4 doses.

Do not feed whole milk or milk replacer simultaneously with fluid electrolytes as this may increase the incidence of diarrhoea. Alternate treatment time with the feeding time during the day.

Calf pneumonia (respiratory disease)

Calf pneumonia is usually caused by bacterial or viral infections exacerbated by high environmental humidity, dampness and poor ventilation causing a build up of odours emanating from faeces and urine. Avoiding overcrowding and instituting proper housing will reduce the incidence of this disease.

Symptoms include high fever, coughing, runny nose and watery eyes. Treatment is usually an antibiotic one based on the advice and guidance of a veterinarian.