



## PRACTICAL APPROACH TO THE HEALTH OF DAIRY REPLACEMENTS

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The key to healthy dairy calves is to keep the infectious pressure low, and make sure the immunity and resistance of the calf is as high as possible. Good colostrum management, which is generally accepted as the most important factor for calf immunity will be dealt with in a separate publication.

### *Husbandry and housing*

After birth the dam and the environment in the calving area are the most important source of infection for the dairy calf. For that reason it is recommended to remove the dairy calf from the dam immediately after calving, and to house it in a clean pen without contact to cows or older calves.

Calves are born with functional thermoregulatory mechanisms. Therefore, healthy calves are readily able to deal with outdoor temperatures as long as they receive adequate amounts of energy and are provided with a dry, well-bedded and draft-free shelter.

Many calf rearing systems can work well if managed properly. In general, outdoor housing is superior to indoor housing, and the risk for transmission of infection is lower in individually housed calves than in groups. If calves are housed in groups the risk is lowest in small, stable groups of calves of similar age.

Inadequate ventilation of calf barns increases the risk of disease due to a build up of high levels of humidity, noxious gases, dust and bacterial content. A thorough investigation of the ventilation, and measures of improvement as appropriate, are warranted especially whenever dairy calf pneumonia is a problem.

### *Post-colostral nutrition and weaning*

Traditionally, dairy calves have been fed milk or milk replacer to an amount of approximately 10% of the calf's body weight (BW) per day (i. e. 4 litres for Holstein calves. This level of nutrition ('restricted feeding') allows only for maintenance requirements, and was introduced to encourage calves to eat concentrates as early as possible, and thus to minimize costs for relatively expensive liquid feeds. Calves suckling their dam or otherwise fed *ad libitum* ingest about 20% of BW per day and reach up to 1 kg of daily weight gain.

Calves on restricted feeding regimes are at most only able to achieve 20 to 30% of their biologically normal growth, with all its associated negative implications for health, future performance and animal welfare. Very high milk rations or *ad libitum* feeding, on the other hand, can have a negative



impact on concentrate intake, which will either delay weaning or cause a growth check after weaning.

An intermediate volume of milk or an equivalent amount of good quality milk replacer (approximately 15% of the calf's birth weight per day) is sufficient to allow calves to reach over 50% of their growth capacity under moderate weather conditions and should avoid the negative impact on the calf's immune system that is associated with lower feeding levels. If calves are fed with these volumes of milk, twice a day feeding is recommended for at least the first 3 weeks of life.

The choice of liquid feed usually depends on availability and producer preferences. If non-salable ("waste") milk is used for feeding dairy calves, pasteurisation is strongly recommended. Milk from cows under withdrawal period from antibiotic treatment should not be fed to calves.

Milk replacers are lower in energy content than whole milk and vary widely in composition and quality. Products containing non-milk proteins are not suitable for very young calves. Since the protein requirements increase rapidly with increased growth rates, products with increased concentration of crude protein (25 – 27 %) should be used for the recommended minimal feeding volumes.

Independent of the feeding system, concentrates and water should be provided to calves at all times to enhance development of ruminal digestion. Consumption of concentrates enables the development of ruminal epithelium necessary for the calf to digest solid feed. Evidence is somewhat contradictory regarding the benefit of additional feeding of forage to young calves. It may be of little benefit if calves are fed on a coarse starter ration. Calves can be weaned once they consistently consume 1 kg of concentrates per day. To assure constant growth rates weaning should preferably be introduced gradually with a decrease of volumes of liquid feed provided over a period of some days.

#### *Management of the scouring calf*

Preferable good management and husbandry would prevent calves from getting diarrhoea. However, if diarrhoea occurs, appropriate management of the diseased calves is important to avoid poor performance and an additional negative impact on the immune system.

Calves with diarrhoea lose an average of about 10 % (but up to 20 %) of their body weight in fluid in addition to their normal losses. For this reason oral rehydration therapy is the single most important treatment to be provided to a diarrhoeic calf. Good quality oral electrolyte solutions should be given as one or more additional feedings to counteract the fluid and electrolyte losses caused by the diarrhoea.



Oral rehydration solutions should contain:

- 90 to 130 mmol/L sodium
- glucose and/or another facilitator of the absorption of sodium and water
- an alkalinizing capacity of 60 to 80 mmol/L from bicarbonate or bicarbonate precursors (the strong ion difference can be calculated to assess the alkalinizing capacity:  $SID = [Na^+] + [K^+] - [Cl^-]$ )
- 10 to 30 mmol/l potassium

#### Continued milk feeding

It is now recognised that milk feeding does not worsen or prolong the course of diarrhoea, despite a somewhat lowered digestive capacity. Rather, withdrawal of milk rapidly results in malnourishment and weight loss. Continued milk feeding not only provides the energy required for weight gain and growth throughout the period of diarrhoea, but also provides the nutrients that are necessary for the recovery of the intestinal mucosa.

#### Antibiotic treatment

Since the infectious agents commonly involved are viruses and parasites the use of antibiotics should be avoided in uncomplicated calf diarrhoea. In calves with diarrhoea and systemic involvement (marked depression, anorexia, fever), the risk of bacteraemia or septicaemia as well as bacterial overgrowth of the small intestine is increased. In such circumstances, administration of broad-spectrum antimicrobials is recommended. Antibacterials used as last resort in human medicine (e.g. fluoroquinolones, 3rd/4th generation cephalosporins) should only be used in single animals for a limited number of strict indications where other antibiotics fail.

#### Literature:

Lorenz, I., Mee, J. F., Early, B., More, S. J. (2011a): Calf health from birth to weaning. I. General aspects of disease prevention. Ir. Vet. J. 64, 10.

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