

Section 6



Calf Nutrition

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Introduction

Whether from the suckler herd, or the dairy herd, a good start is essential for calves.

- ① What are the nutritional needs of the suckler calf from birth to weaning?
- ② What are the key issues in feeding artificially reared dairy-bred calves?

Calf Nutrition

1 What are the nutritional needs of the suckler calf from birth to weaning?

- As soon as possible after birth the calf must receive colostrum or first milk, which supplies the nutrients needed for survival. As well as being a source of nutrients colostrum contains immunoglobulins or antibodies, which are essential to the survival and health of the calf.
- Milk yield of the cow is the primary nutrient source for the suckled calf during the first few months of life. Milk yield is higher for beef x dairy breed cows than beef x beef breed cows. Due to their origins some beef breeds, such as Simmental, have a relatively high milk yield, but there is large variation in milk production within all breeds. Young cows, particularly first-calvers, generally have lower milk yield than mature cows. Lactation curves of suckler cows are relatively flat – their milk yield is relatively constant.
- Calves suckling cows with higher milk yield grow faster than those suckling cows with lower milk yield. The lower the milk supply from the cow, the higher the intake of grass by the calf, but the increase in grass consumption usually cannot compensate fully for a restriction in milk supply and therefore, calf growth rate is lower.
- As calves grow, and their dam's milk yield is static or starts to decline, they eat more grass.
- In order to meet calf growth potential and weaning weight targets, "creep feeding" meal and/or "creep grazing" the calf can be used to compensate for a lack of milk produced by the cow and/or deficiencies in grass supply or quality.
 - Creep feeding results in an increase in dry matter/nutrient intake despite a decrease in grass intake, and consequently, increases in growth rate. Calf growth response to creep feeding is higher when cow milk yield is lower, when grass supply is inadequate and when grass quality is poor.
 - Similarly, calf growth response to creep grazing is a function of cow milk yield, and grass supply and quality where the cows are grazing.

- Under the "Animal welfare, recording and breeding scheme for suckler herds" (Suckler Welfare Scheme), supplementary concentrate feeding for four weeks pre-weaning is compulsory.
- Male calves are heavier at birth and grow faster pre-weaning ($\sim +0.1$ kg/day) than females.
- The limited capacity of the suckler calf to compensate post-weaning for growth setbacks experienced pre-weaning due to insufficient milk, means that live weight differences at weaning are largely retained until slaughter.

Key fact

The suckled calf receives nearly all its nutrition from the cow for the first three months of life.

Key targets

Pre-weaning daily live weight gain (not including creep feeding). Calves from:

Beef x Dairy cows:

- Males = ~ 1.15 - 1.30 + kg; Females = ~ 1.05 + kg

Beef x Beef cows:

- Males = ~ 1.05 - 1.20 + kg; Females = ~ 0.95 + kg

2 What are the key issues in feeding artificially reared dairy-bred calves?

Key Target

Target live weight gain pre-weaning of 0.5-0.6 kg / day

How to

Decide how much liquid feed the calf should be offered

- The calf should receive at least 13-15% of the calf birth weight in whole milk or good quality milk replacer mixed at 125 grams / litre of water.

- Calves should get liquid feed twice a day until they are at least three weeks of age.
- Nipple feeding is more natural and tends to satisfy the suckling urge but feeding method does not have a major effect on weight gain.

Examples of Feeding Rates for Different Breeds

Breed	Holstein, Friesian, HF x Norwegian Red Cross	HF x Jersey Cross	Jersey
Average birth weight	37-40 kg	32 kg	28 kg
Minimum Volumes fed / day up to day 5	5 litres	4.5 litres	4.0 litres
Minimum Volumes fed / day after day 5	6.0 litres	5.0 litres	4.5 litres

Key risk



- Whole milk is the natural follow-on from colostrum but
 - Milk from cows that are under antibiotic treatment (including for mastitis) should not be fed to calves.
 - Milk with a high bacterial contamination, e.g. high SCC, risk of Johne's disease, salmonella and *E. coli*, should only be fed to calves after pasteurisation
 - Ideally milk from the first eight milkings should be pasteurised and chilled before feeding to calves

Milk from cows treated with antibiotics, and still within the withdrawal period, should never be fed to calves as it can affect the taste of the milk leading to calves not drinking as much milk, with resultant lower weight gains. But, more importantly bacteria that are resistant to these antibiotics can develop and if animals need to be treated with these antibiotics they may not work as effectively.



Checklist

Milk replacer?

- There is significant variation in quality of milk replacers. You generally get what you pay for.
- A good quality milk replacer should preferably contain only milk derived protein sources.

- To promote growth aim for a crude protein level of 22-25%.
- Fat sources should be highly digestible and preserved with an antioxidant.
- Crude fibre levels above 0.15% can be indicative of plant proteins. Avoid high crude fibre levels.
- Target ash content of 6.5-7.5%

How to

Decide how much concentrate to feed



Intake of concentrates is the single most important factor in the development of the calf's stomach

- Use a high specification calf ration. Target energy density = 0.95 UFL, crude protein content = 18%, balanced for minerals.
- A coarse ration will stimulate rumen development and calves will start to 'chew the cud'. Avoid finely ground feeds
- Additives are no substitute for good feeding management. Calves should have access to clean, palatable starter concentrates from 4-7 days old. Only offer small quantities of fresh feed every day, as this will reduce waste
- Calves fed coarse starter concentrates eat more and have higher weight gains than calves fed pelleted starters
- After a few weeks pelleted starters can be gradually introduced.

Alternatives



Roughage

- The concentrate feed is significantly more important than the roughage to develop the calf's stomach.
- Calves need small quantities of roughage – hay or straw. This is more important if feeding a pelleted ration.
- Avoid feeding too much. It can result in a pot belly. There is a greater risk of this with overeating of hay.
- Where pot bellies (or hay bellies) are observed it indicates that the rumen is packed with hay which can not be digested properly

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Key Question



Is water important?

- Water is important for rumen development. Clean water should be offered at all times. Milk is not a substitute for free access to water.
- A clean, fresh supply of water should be offered from 3-4 days of age

How to

wean calves.



- Wean calves at least 80 kg live weight when the calf is consuming at least 1 kg of concentrates per day.

- Calves that have access to concentrates from the second week of life and are offered the minimal required volumes of milk will usually eat 1 kg of starter concentrates from approximately 8 weeks of age.
- If calves that are offered near ad libitum milk, gradual weaning should not begin before week 12.
- In weaning, gradually reduce the volume fed over a period of 7-10 days. Calves fed twice a day should be reduced to once-a-day before weaning.
- When weaning calves aim for a uniform group as it makes post-weaning management easier. Age should not be an important factor at weaning.
- Increasing the weaning weight as the season progresses can help avoid having a group of small calves in addition to the larger earlier-weaned calves.

