

Nutritional management of the dairy-beef calf - from arrival on beef farms to weaning.

Key targets of the calf rearing period

- Double calf birth weight by 8-weeks (e.g. 40 kg to 80 kg in 8-weeks).
- Achieve a live weight of 100 kg by 12 weeks of age.
- Record a growth rate of 0.7/0.8 kg per day.
- Transition calves from a pre-ruminant to ruminant diet without any setbacks.

The amount of milk fed and concentrate intake determines calf growth rate in the period up to 12 weeks, with the target being to get the calf to grow from 40-45 kg at birth to about 100 kg. This can be achieved with inputs of ~25 kg of milk replacer and 120 kg of concentrates on dairy-beef farms.

Selecting a calf milk replacer

- Protein content >20%.
- Oil content 18-20%.
- Ash content <8%.
- Fibre content <0.15%.
- Contains milk derived proteins (skim milk powder or whey protein concentrate).
- Easily dissolved without leaving residuals on feeding equipment.

Milk replacer feeding levels

- The first feed offered on farm after arrival should be electrolytes, to rehydrate calves after transport.
- Care should be taken to ensure calves are trained onto their new milk feeding system.
- For dairy-beef systems where calves are purchased at 2 to 4 weeks of age, each calf should receive at least 13-15% of its birth weight in a good quality milk replacer – typically 6 L/day fed in two feeds for the first 4-weeks and 4 L/day fed in one or two feeds up to weaning.
- To make one litre of calf milk replacer at 12.5% solids, mix 125 g of milk powder to 875 ml of water.
- Mixing rates may vary between products; always adhere to the manufacturer's instructions.
- Consistency in the timing and mixing of milk replacer is important to avoid digestive upsets.
- Milk replacer should be considered as a feed; clean, fresh water should be available at all times.
- The volume of milk replacer fed determines calf concentrate intake.

Table 1. Teagasc Grange and Johnstown Castle dairy-beef milk feeding protocol

Days	Milk replacer per day per calf	Litres per feed	No. of feeds per day	Concentrates
10-30	750 g of milk replacer.	3	2	Ad lib
30-50+ (weaning)	500 g of milk replacer. If calves have not reached their targeted weaning weight of 85-90 kg, continue to feed at same rate until heavy enough to wean.	2	1 or 2	Ad lib (up to 2 kg)

Mixing milk replacer

- Maintain a high level of hygiene throughout the mixing and feeding process.
- Use scales to measure the powder correctly and to ensure consistency.
- Mix milk replacer using water below 40°C – boiling water damages the milk proteins.
- Reconstitute by adding the total amount of powder required to half the measured volume of water.
- Mix thoroughly (use a mixer or whisk) and then add the balance of warm water to make up the correct volume.
- Aim to feed calves milk at body temperature (37-39°C).

Concentrate feeding

- Concentrate supplementation is the single most important factor for rumen development.
- A high-quality, palatable starter concentrate should be available to calves freely, as soon as they arrive on farm, and offered fresh daily.
- Calf concentrate should contain 17-18% crude protein and have an energy value of at least 12 MJ/kg (greater than 0.95 UFV/kg).
- Finely ground, dusty feeds should be avoided.
- Calves fed coarse starter mix initially eat more and have higher weight gains than calves fed pelleted starters.

Forage supplementation

- Forage supplementation is beneficial to rumen development, but not as fundamental as concentrates.
- Calves need small amounts of roughage.
- Straw is an easier roughage for calves to digest and is preferred to hay.
- Avoid the over consumption of straw as this reduces the overall energy density of the diet. Research recommends a concentrate to roughage ratio by weight of 8:1 or 200 g/hd/ day to pre-weaned calves.

Weaning

- Weaning decisions should be made based on concentrate intake and weight, not age.
- Calf weaning age can vary from 6 to 10-weeks depending on the feeding strategy.
- Gradually wean by reducing the volume of milk fed over a period of 7 to 10 days. If calves are being fed milk twice a day, weaning can be achieved by cutting down to once a day feeding.
- Calves should be consuming >1 kg of calf starter per day for three consecutive days prior to ceasing liquid feed.
- Monitoring starter intake allows adjustment/delay of weaning dates for any calves not meeting growth targets/eating consistently well.
- Stressors, such as dehorning/vaccination, should be avoided during the weaning period.



More information on the Teagasc DairyBeef 500 Programme can be found at Teagasc.ie

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