



Frequency and quantity of milk feeding to dairy calves



Picture: Größbacher, BOKU

This factsheet is based on Lidfors, Lena, & Hernandez, Carlos E. (2023). Mini-review – Frequency and quantity of milk feeding to dairy calves. Zenodo. <https://doi.org/10.5281/zenodo.7794436>



Biology and needs of calves

In an increasing number of European farms, dairy calves are fed with milk or milk replacer only once a day (OAD). This OAD feeding, with milk replacer often prepared at a higher concentration, is mainly used to reduce labour, especially in seasonal grass-based systems. However, this practice – which can lead to underfeeding – may restrict behavioural and physiological needs of the calf in terms of expression of behaviours, hunger and health.

In calves suckled by their dam, suckling frequency and duration depend on many factors (e.g. age, sex, breed, time of the day). Beef and dairy calves suckle from 4 to 9 times/24 h depending on the breed in the first few days after birth with suckling sessions lasting 6–7 minutes. With age, the frequency of suckling decreases (e.g. 6.3 times/24 h at 2 weeks of age to 3.8 times/24 h at 8 weeks of age) while the duration of suckling sessions increases (e.g. from 6.2 min at 2 weeks of age to 8.8 min at 4 weeks of age). Up to several months of age, calves therefore suckle several times a day if they are given the opportunity to do so.

Generally, calves are fed each day with milk (replacer) corresponding to 10 % of their body weight (about 4.5–6 L) which should not cause abdominal pain or entry in the rumen because calves can spontaneously drink up to 13 % of their body weight in one meal. However, calves with free access to milk may drink over 20 % of their body weight per day from 2 to 6 weeks of age. In a comparative study with calves fed 20 % or 10 % of their body weight in 2 meals, the latter had a lower energy balance and weight gain, displayed more signs of hunger, expressed less play and more cross-sucking behaviours, and had impaired cognitive performances.

Calves are hormonally primed to digest milk during their first 3 weeks of life and intake of solid feed is negligible up to 3 weeks. They can digest significant amounts of solid feed only after 6 weeks, that's why calves are unable to compensate for reduced milk intake until then. From 6 weeks, calves can maintain their growth with concentrates when milk allowance is limited, but shouldn't be considered fully ruminant. Dairy calves are often weaned off milk when they are 2 to 3 months of age, provided they have reached a certain target weight and are eating a certain amount of solid feed daily, these targets varying with breed.

The use of artificial teats when feeding calves, with or without a lower flow rate, promotes a more natural behaviour and therefore increases the time spent drinking and can reduce non-nutritive sucking and cross-sucking behaviours.



Legal requirements

Council Directive 2008/119/EC of 18 December 2008 lays down the minimum standards for the protection of calves and requires that calves must be fed twice a day with an appropriate diet adapted to their age, weight and behavioural and physiological needs, to promote good health and welfare.



Method

To ensure that calves are fed appropriately according to their needs, it is essential to check their body condition. Underfeeding can also be visible with abnormal posture, glow and cleanliness of the fur, and with abnormal behaviours indicating hunger as detailed in the the **Indicator factsheet 'Frequency and quantity of milk feeding to calves'**.

Focus areas for inspection

The following indicators can be used to assess if calves are fed with an appropriate diet adapted to their age, weight and behavioural and physiological needs, to promote good health and welfare:

- Body condition (from emaciated to fat)
- Glow of fur (from dull coat to shiny coat)
- Cleanliness (from very dirt to very clean)
- Body posture when standing (from hunched to being active and attentive)
- Behaviours indicating hunger/satiation (observation for 30 minutes)

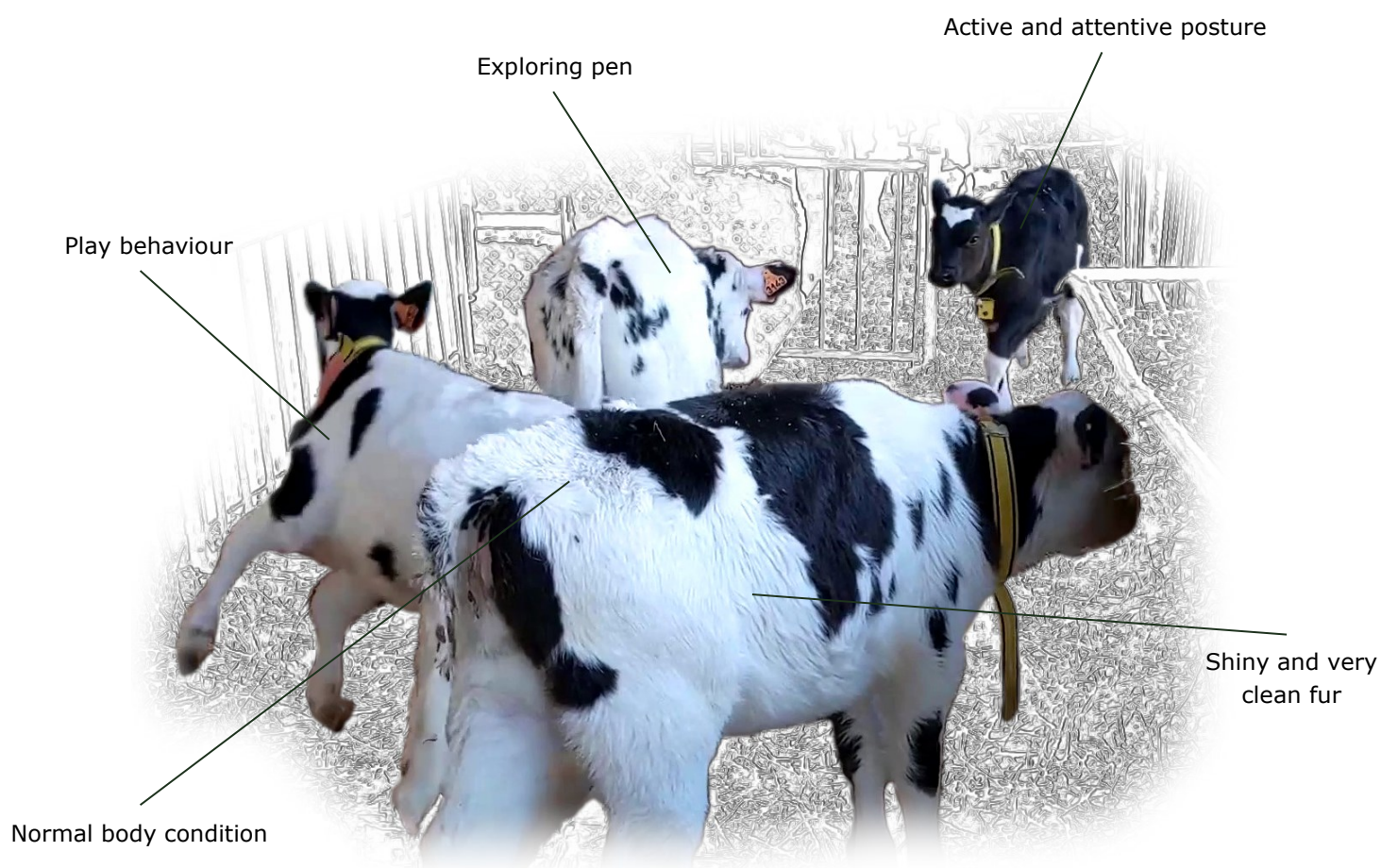


Figure 1: Animal-based measures to assess compliance with regard to feeding. Picture: Brunet, INRAE

Legal requirements

Council Directive 2008/119/EC of 18 December 2008 laying down minimum standards for the protection of calves.

'This Directive lays down the minimum standards for the protection of calves confined for rearing and fattening.'
(Article 1)

'(...) 'calf' means a bovine animal up to six months old'
(Article 2, Paragraph 1.)

'All calves must be provided with an appropriate diet adapted to their age, weight and behavioural and physiological needs, to promote good health and welfare. To this end, their food must contain sufficient iron to ensure an average blood haemoglobin level of at least 4,5 mmol/litre, and a minimum daily ration of fibrous food must be provided for each calf over two weeks old, the quantity being raised from 50 g to 250 g per day for calves from eight to 20 weeks old. Calves shall not be muzzled.'
(Annex 1, Paragraph 11.)

'All calves must be fed at least twice a day. Where calves are housed in groups and not fed ad libitum or by an automatic feeding system, each calf must have access to the food at the same time as the others in the group.'
(Annex 1, Paragraph 12.)



References

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