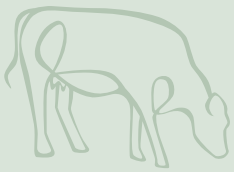
CARE4DAIRY

Heifer Nutrition

Good practice

Best practice

Best practice farms optimise the quality and performance of their heifers by providing tailored nutrition in a clean, safe and enriched environment which supports optimal health, welfare and human-animal interactions.



Why is this important?

As immature animals, heifers will continue to require nutrition to support growth and reproductive performance. Ensuring heifers receive tailored nutrition will be a vital investment to ensure a long, healthy and productive life.

Good practice

Watering

- Clean water must be freely available at all times.
- There must be at least one water drinker (i.e., an individual drinker or collective water trough) for every 10 heifers. Provide 90 cm of trough space for every 10 heifers.
- Heifers must have access to an adequate volume of clean, palatable water enabling them to maintain healthy hydration irrespective of their diet and the temperature of their environment. Heifers need approximately 40 L of drinking water per day (this will vary depending on environmental temperature, moisture content of feed, breed, size, health status and cycle stage). Water flow should be sufficient to prevent stagnation.
- Drinking water must meet the same potability criteria as for humans (constituent minerals and potential for pathogens). If the drinking water is not running water (e.g. rain, borehole, pond) it should be tested annually as a minimum as well as whenever problems are observed. Attention should also be paid to open wells contaminated by surface water, where infectious agents often accumulate after periods of rain.
- Water troughs/ drinkers should be easily accessible for both the heifers (if possible from two sides) and humans (for maintenance), positioned in high traffic areas but on a stable, drained area (not close to gateways) and drinkers should be cleaned at least once a week and immediately if identified as dirty or contaminated. Stagnation of water should be avoided.
- Where water intake appears to have reduced (drop in production, drop in feed intake, dry dung, animals hesitating or jostling at drinkers, bawling and sucking noises) the troughs/ taps must be checked for any problems (e.g. lack of flow, contamination or leakage).

Feeding

- Heifers must have daily access to a palatable ration that meets their nutritional needs (energy, proteins, vitamins and minerals), promotes satiety and maintains skeletal growth, body condition, health, and vigour. Advice may be sought from a veterinary advisor or cow nutritionist.
- The composition of diets must be adjusted for growth rate, reproductive stage, body size, environmental temperatures and range of foodstuffs offered (e.g. pasture, hay, silage, concentrates). Consult your veterinarian or a nutrition specialist for advice. Use of regular body condition scoring enables adjustment for over or underweight animals.
- Heifers should have the opportunity to graze outdoors, where weather conditions permit, however heifers out on pasture may require supplementation of roughage, concentrates and trace elements.
- The nutrient content of feeds should be checked (e.g. with nutrition tables and/or analysis) to ensure that diets are balanced and feed is free of spoilage.
- Roughage must be provided to increase chewing time and rumination (fibre combined with saliva helps to reduce the risk of acidosis).

Nutrition

Heifer Nutrition

- Roughage should be available continuously (frequently push up feed in the bunk) and concentrates provided on a consistent schedule.
- Changes to diet composition should be introduced gradually to allow heifers and their digestive tracts (rumen & microflora) to adjust. This will include when they are given access to pasture.
- In hot weather, feed should be distributed early in the morning and late in the evening (cooler times of the day) and the fibre content reduced because digestion of cellulose requires energy and produces extra heat because of the digestion process.
- After 6 months of age, both mineral and fibre content of the diet should be gradually increased. If this includes more than 2 kg of concentrate, feeding should be divided into 2 meals.
- Both the macro (phosphorus, calcium, vitamin E) and trace element (copper, zinc, sulphur, selenium) composition of the diet should be calculated. Provide 150-200 g/day per heifer of mineral supplementation. Total calcium input should be limited to 60 g per day and magnesium 40g per heifer per day.
- Where salt blocks are provided, they should be located away from water sources.
- Farms should source their feed ingredients and concentrate from authorised companies who perform a risk-based control plan for residues and contaminants. Where raw ingredients are used, a risk- based surveillance plan should be established to ensure the absence of mycotoxins, other toxins or other contaminants.
- Feed should be visibly clean, not contain obvious mould and be free of contamination from faeces, rubbish, sticks, tree leaves or toxic plants. For less visible sources of contamination, testing should be regularly completed to ensure there is no evidence of waste, powder, poisonous plants or any other potential source of microbes, parasites or toxins.
- Feed should be stored in a suitable environment to protect its quality and prevent contamination with toxic or harmful substances, especially pesticides and chemicals stored on the farm. Birds, wild or domestic animals should be prevented from accessing stored feeds. The “best before” date indicated on label should be respected.

Monitoring heifer growth

- Optimising skeletal development results in taller heifers that experience fewer calving difficulties and higher milk yield. A satisfactory benchmark is that heifers should achieve 30-35% of mature body weight at 6 months, 60-65% at 15 months and about 90% at 24 months of age.
- Weight gain and body condition scores (BCS) should be monitored for each animal, with consideration of their individual progress and published benchmark values for the breed. Dietary adjustments should be made to encourage under/ overweight animals to reach target weights.
- Heifers should be weighed/measured at the same time of the day and at the critical timepoints (before and after insemination, at the time of pregnancy confirmation and prior to calving). If it is not possible to weigh all animals in the group, a representative group of heifers should be selected with the same animals weighed each time. The diet should then be adjusted to achieve weight targets.
- Heifer body weight, BCS and average daily gains should be monitored at key stages (e.g. before weaning, before breeding) and feeding strategies refined or weaning delayed to achieve targets. Aim for average daily gains, in post-weaned heifers, calving at 24 months of age, of 600- 1000g per day, depending on the breed.
- Puberty in dairy heifers is more related to body weight and BCS than to age. Heifers should be weighed or measured regularly and when they reach 55-65% of their expected mature body weight they should be considered ready for insemination. Although there is a considerable breed variation in the age at which the heifers reach puberty, on average this happens at approximately 15 months of age, with the optimal first calving age between 22 and 24 months of age.
- Body condition scores at the time of calving should be between 3-3.5 (on a 5-point scale). During the final 3 weeks of pregnancy heifers should be fed a ration similar to the lactating herd, with amounts adjusted based on the BCS at this time.

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- Both excessively fat and thin heifers are at higher risk of difficult or obstructive labour and the requirement for assisted calving. Heifer BCS should be monitored and their diet adjusted accordingly during the latter stages of pregnancy.
- Heifer BCS should be optimised to reduce the risk of lameness caused by claw injuries. Overweight heifers are vulnerable to strain from the additional weight loading and underweight heifers (without the cushioning of the digital fat pads) have thinner, more vulnerable claws.
- Careful management of BCS in early pregnancy will help avoid the need for nutritional restrictions during the last trimester, which increase the risk of complications such as: compromised placenta and foetal weight, and weak contractions during labour (deficient relaxation of the pelvic musculature/ligaments which aids natural calving).

Best practice

- **Best practice** farms have at least 2 water sources in the area available to the heifers, providing at least one source for every 10 animals. Water should be provided from an open surface.
- **Best practice** farms keep the cows and heifers in separate areas so they can be fed separately.
- **Best practice** farms allow heifers to have daily access to pasture, except in extreme weather. The time spent on pasture should be determined by the weather, daylight hours available and ideally individual preference by the heifers, i.e. a choice based system. To ensure a high plane of nutrition for heifers managed at pasture, best practice is to assess grazing residuals daily. Heifers should be moved to a fresh allocation of pasture based on meeting target post-grazing heights.
- **Best practice** farms develop the composition of appropriate transition diets with input from nutritional advisors (e.g. veterinarian) to minimise the risk of postpartum disorders.
- **Best practice** farms provide individualised diets for each animal to ensure a smooth transition from gestation to lactation diet.
- **Best practice** farms harvest forage at the right stage and test forage quality throughout the growing season to ensure optimal nutrition.
- **Best practice** farms provide feed uniformly and make it available all day. The feeding schedule should be kept consistent and allow adequate time to maintain food availability in each area where animals are kept.
- **Best practice** farms allow all heifers to choose to eat roughage at the same time. The space allowance is crucial to ensure that all of the heifers have access to their daily feed allocation without compromising their time budget (i.e., decreasing lying time).
- **Best practice** farms keep accurate records of individual heifer weights and BCS to allow meaningful adjustments to be made promptly. They should be weighed after weaning, at six to eight months of age, before breeding, at breeding, when pregnancy is confirmed and before calving. Their average daily gains should be calculated. On best practice farms heifers are weighed or measured at regular intervals (as opposed to reliance on BCS or weighing once or twice at landmark intervals). This allows better feed management for each individual and refinement of future decision making at the herd level.
- **Best practice** farms regularly (minimum of annually) test both nutritional and hygienic quality of concentrate and roughage provided on the farm.
- **Best practice** fams monitor environmental temperature and humidity of feed stores to ensure they are kept at the optimum value, as indicated on the food label. This may include use of automatic sensors or probes.
- **Best practice** farms with a high incidence of illness or injury from ingestion of foreign objects use endo- ruminal magnets. This is not an alternative to environmental management which should minimise the risk of ingesting unsuitable objects.

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Environment

Good practice

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See the **Heifer Environment factsheet** for more information

Health

Good practice

See the **Heifer Reproduction** and **Heifer Health factsheets** for more information

Best practice

- **Best practice** farms monitor heifer weight and BCS monthly as a minimum (as opposed to relying on one or two key decision making timepoints) to enable tracking of each individual heifer's progress and support nutrition planning for future seasons.

See the **Heifer Reproduction** and **Heifer Health factsheets** for more information

Behaviour

Good practice

- Heifers should have access to diets that fulfil their nutritional requirements, but also satisfy their behavioural needs, with sufficient forage to encourage rumination.
- Feeding times should be linked to the heifer's activities. Increasing the number of meals per day stimulates animals to exercise and interact socially, promoting positive feelings.

See the **Heifer Behaviour and Human-Animal Interactions factsheet** for more information

Best practice

- **Best practice** farms use food to enrich the heifers' environment, providing a wide variety of enjoyable food types, perceived to be rewarding by the animals.
- **Best practice** farms encourage positive human-animal interactions during feeding. By using associative learning, the presence of humans equates to accessing favoured food stuffs. For animals raised on pasture, make sure that they are close by and observing you when you offer or add the food stuff to the environment. These interactions must be consistently positive and occur on a regular basis to have a positive cumulative effect.

See the **Heifer Behaviour and Human-Animal Interactions factsheet** for more information

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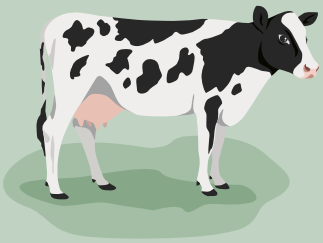
Summary



Farm

Farms which monitor heifer development closely and adapt their management protocols accordingly will benefit from improved performance and profitability.

Heifers

Heifers provided with a safe environment and optimal nutrition are more likely to benefit from healthy growth and development and resilience to both stress and risk of disease.

Handler

Clear farm management protocols, with associated provision of training and appropriate equipment and handling facilities, will help ensure farm personnel remain safe and happy in their role.

Take pride in all of your farm's good and best practices towards animal welfare!

Additional resources

Care4Dairy.eu

European Commission · IZS Teramo · UCD Dublin · ELGO-DIMITRA Hellenic Agricultural Organization-Dimitra · SLU · INRAE · phylum · Institut de l'Elevage idele