The growing heifer: is she on track for optimal performance?

There is an increasing awareness of the importance of dairy heifer-rearing in dairy herds. Raising heifers is an investment in the future, and the price of neglect today may eventually be a loss in productivity in the form of reduced milk production, increased health problems and early culling. This article will discuss raising heifers after weaning for optimal growth and productivity.

by Dr Anna Catharina Berge, Berge Veterinary Consulting BVBA. www.alltech.com

The importance of pre-weaned calf management and feeding has been emphasised by many, and a large number of farmers have already gone to great lengths to provide the best possible start for their young stock.

Numerous publications (see International Dairy Topics Vol 16. Number 5) have highlighted the importance of sufficient good-quality colostrum as soon as possible after birth and adequate good-quality hygienic milk or milk replacer for the older heifer.

Ensuring access to a high-quality, palatable textured starter feed to boost grain intake and rumen development is also critical. However, on many dairies, the management and nutrition of heifers from post-weaning to pre-calving remains a challenge.

Targets and goals needed for optimal heifer growth

Lord Kelvin said in 1883, "If you can not measure it, you can not improve it," and that holds true for heifer-rearing. The performance of dairy heifers is difficult to evaluate without being able to appropriately measure that performance – and it is even more difficult in large herds, especially when attempting to visually evaluate performance, due to the variability in heifer ages.

The primary steps to take, therefore, should include setting appropriate growth goals, monitoring performance and adjusting the system as needed.

Heifer growth can be monitored by using scales or measuring tapes to measure heart girth, height and hip girth. Increase in structural height occurs rapidly in the first six months of life, whereas weight gain is more evenly distributed throughout the growing phase.

For optimal first lactation production, heifers should be ready to be bred at 13-15 months, resulting in calving at 22-24 months old, when they should have reached 85% of their mature body weight.

This age and weight is based on the fact that heifers that calve earlier may have more growing to do in the first lactation and, therefore, may need to partition nutrients and energy for growth, lactation and gestation.

Heifers who are fed sub-optimal diets will have delayed oestrus and will not calve before 24 months of age. Heifers that calve later tend to become over-conditioned, potentially leading to greater incidences of fresh cow disease, due to lower dry matter intake in early lactation or fattening during the critical pre-pubertal period.

To achieve target growth in heifers, manage the heifer's nutrition, environment and management. Maintaining protocols for heat detection and insemination are also necessary. Professor Jud Heinrichs and his team have provided excellent tools – freely available on the Penn State Extension website – for monitoring and estimating your heifer's growth.

These tools allow for the development of farm-specific growth curves for heifers based on the average mature cow size and the average age at calving. In addition to height and weight measurements, body condition scoring (BCS) is crucial. It is recommended to weigh and estimate BCS at four, eight and 12 months of age and five months pre-calving.

A dairy heifer's BCS will increase as she grows and should be around 3.0 at breeding and should not exceed 3.5 at calving. If a dairy calf is putting on too much weight before nine months of age, it is usually an indication of insufficient dietary protein. After nine months of age, the cause of weight gain is usually excess dietary energy.

Nutrition and growth post-weaning to six months of age

From post-weaning to around six months of age, the heifer is transitioning to become a mature ruminant. A lot of structural growth occurs during this period, and the animal should be able to grow as much as possible.

She still needs sufficient amounts of highly digestible grains, in addition to increasing quantities of good-quality roughage. It is important to regularly assess heifers for rumen fill, abdominal fill, BCS, faecal consistency, coat condition and signs of respiratory distress.

Poor growth post-weaning is most likely due to a too-fast transition to a high-forage diet, as well as stress around weaning. It is important to evaluate age range in heifer pens post-weaning, since large variation in age may result in diets not being suitable for all animals in the pen, and competition for bunk feeding space may result in some heifers not receiving sufficient nutrients for optimal growth.

Thus, on some large dairies, where a group of 10 heifers may have very similar age ranges within the pen, there may be fewer issues in comparison with smaller dairies, where groups of 10 animals may have a wide age range in the pen.

Water and dry matter intake go hand-in-hand: water needs to be of good hygienic quality and readily available at all times. It is important to ensure that calves find the water troughs and learn how to use them when moving from one system to another.

Nutrition of the heifer over six months of age

As the heifer grows, her dry matter intake will increase, and an increasing component of her nutrient and energy needs will be derived from forage. One important goal is to prepare the heifer for future management systems, such as grazing.

Around the time of puberty and thereafter, when the forage quality is excellent and high in energy content, heifers may become over-conditioned. Lush pasture may also be an issue, as it can reduce conception rates and lead to calving

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difficulties. If forage quality is poor and the concentrate is not balanced to the forage, heifers may be underdeveloped at the target breeding age.

Even though a lower energy forage may be used for heifers, it is very important that it is of good hygienic quality.

Mouldy feed, as well as feed that is not visually contaminated, may contain high levels of mycotoxins that depress development and the immune system.

A good quality, broad-spectrum mycotoxin binder, such as Mycosorb A+ from Alltech, is required, not only in the lactating herd but also in heifers and dry cows.

Microminerals are important for health and growth

In addition to the main energy and nutrient composition of the diets, it is important to ensure that micronutrients and vitamins are included at sufficient levels for growing heifers. Trace mineral deficiencies often result in suppressed immunity and, thereby, can impact disease resistance and performance.

Organic minerals are more efficiently absorbed and assimilated in the body compared to inorganic minerals, meaning that the inclusion rate of organic minerals can be lower than that of inorganic minerals.

Alltech's Bioplex organic trace minerals include copper, zinc, manganese and iron, all of which are important for the growth and development of the heifer.

Globally, selenium deficiency is common. Selenium is essential for the functioning of the immune system and is a powerful antioxidant, removing harmful free radicals.

Organic selenium (Sel-Plex, Alltech Inc) has been shown to improve uptake and storage in the body compared with inorganic selenium (sodium selenite) and has also been shown to optimise animal performance.

Health challenges

In general, health challenges in heifer-rearing decrease once calves are weaned. However, respiratory and enteric diseases may still be present and can impact the heifer's growth and future lactational performance.

Calves or heifers with severe cases of respiratory disease have been shown to grow slower, breed and calve later and produce less milk than healthy calves and heifers.

Respiratory diseases may be a challenge in heifers at 3-4 months of age, and it is very important to provide optimal environmental conditions, such as good air quality – try to keep heifers housed outdoors, if possible – good bedding material and resting areas with adequate protection from wind and rain. A good vaccination protocol, developed with the veterinarian, is strongly recommended and cost-effective in farms with respiratory health challenges.

Parasites may create or contribute to health problems, especially for heifers on pasture, and as such, it is important to have a good pasture rotation programme and good management.

A routine deworming may begin with calves at weaning and continue until eight months of age, or three and six weeks after they are put on pasture, and in the fall after confinement.

Coccidiosis may affect heifers post-weaning, and it may be necessary to use a coccidiostat or ionophore. It is important to evaluate management and nutritional components that might contribute to the severity of coccidiosis. Treatments for external parasites are also important for the heifers to improve welfare and reduce stress.

Protocols and routines for evaluating hoof health in growing heifers are very important. From right after weaning until around six months of age, straw will provide the best floor conditions for young animals.

Thereafter, they should transition to the systems they will live in as lactating dairy cows, such as cubicles, yards and pastures.

Young stock are sensitive to hoof infections. Invite a hoof specialist to evaluate your farm conditions and ensure that you are not missing any subtle hoof health problems in your heifers.

It is cost-effective to invest in heifers

A large proportion of the herd are calves and heifers, and they represent the future dairy herd. How much time and resources are being spent on finding the optimal programmes for health and growth in heifers, compared with the lactating animal? Have targets and goals been set?

Whether you are a dairy farmer, nutritionist, veterinarian or salesperson, it is cost-effective to invest in young stock — they will pay you back when you provide them the opportunity to do so. ■