

Setting targets for efficient calf and heifer management

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Holstein Friesian heifers calving at 23-25 months produce more milk over their first five years of life than older calving animals because they achieve more lactations per unit of time, and have higher survival rates, according to findings at the Royal Veterinary College, London.

Dairy cows do not become profitable until at least half way through their second lactation, so improving milk production and survivability will clearly pay dividends.

In fact, heifers calving at 23-25 months produced an extra 7000kg of milk over five years compared to those calving at over 30 months; with milk prices set to increase, this could equate to at least an extra £2000 per animal based on extra milk revenue alone.

Although most dairy producers aim for first calving at two years, the mean age at first calving for Holstein Friesian cows across the globe is often greater than 24 months, and is 28 months in the UK (NMR, 2013).

This variation in calving age may be due to differences in age at breeding as a result of poor growth during the rearing period, or it may simply be due to a farm management decision to calve heifers later than 24 months.

Age at first breeding

Most producers start first breeding at 15 months of age, but maiden heifers require on average 1.4 services per conception and have a first service conception rate of only 67%, according to the study findings.

Therefore first breeding must start at



13-14 months of age to ensure heifers are actually in calf by 15 months. In fact, heifers which were bred at 13-14 months had the best fertility – 84% conceived to first service, compared with only 51% of heifers served for the first time at 17 months.

Target growth rates

Heifers can be served at 13-14 months providing early growth is good. Targets must be set – about 55-60% mature body weight at first breeding and this should have increased to 90% by first calving (85% after calving).

For example, if mature body weight of the herd is 660kg, the target body weight at first breeding at 13-14 months is 360kg.

To achieve this body weight, a 40kg calf at

birth will need to gain 320kg over 410 days – which is an average daily gain of at least 0.75kg throughout the entire rearing period. But, in practice, growth rates vary enormously ranging between individual calves from 0.2-1.3kg per day during the first six months of life often associated with poor nutrition and/or health challenges.

This range in growth had a significant impact at the time of first breeding, with many animals deemed too small to be bred, and were not served for the first time until on average 17-20 months of age.

Milk feeding

Calves can convert feed into growth most efficiently during the milk feeding period. Therefore to achieve target breeding age and weight in a cost effective manner, growth should be maximised during the first few months of life.

Calves must be fed sufficient energy and protein to support the growth rate required. This depends on the total amount of milk solids fed per calf per day. A 10% solution of milk fed at 10% of the calf's body weight (approximately 500g milk solids per day) may produce healthy calves, but it will

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Table 1. The effect of mixing rate and milk volume on the amount of milk solids provided.

	Milk replacer mixed at			
	100g per litre (10%)	125g per litre (12.5%)	150g per litre (15%)	150g per litre (15%)
Milk solids per litre (g)	100	125	150	150
Milk volume (litres/day)	5	6	5	6
Total milk solids per day (g)	500	750	750	900

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restrict growth rates at the time of the highest potential feed conversion rate.

To achieve growth rates of at least 0.75kg per day before weaning, feed 700-900g of milk solids per calf per day in two or preferably more feedings.

This can be achieved by feeding either a higher concentration, or a higher volume of milk (see Table 1).

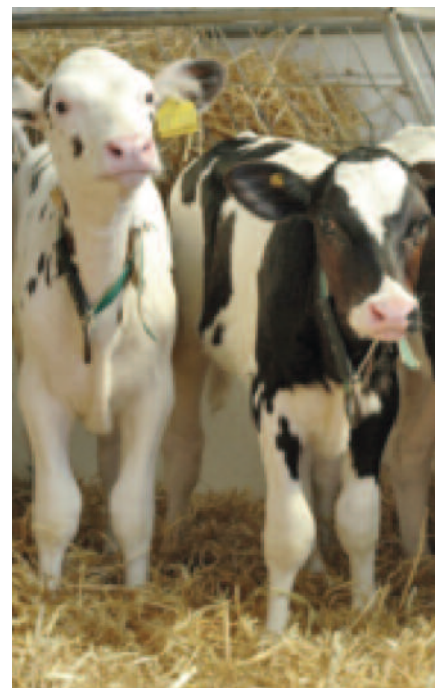
As long as good quality milk is fed under hygienic conditions, providing up to 900g solids per day will not increase the risk of scours, an issue which is often more dependent upon hygiene and calf stress.

Good quality calf milk replacer is acidified and is typically more consistent than surplus

whole milk. Depending on the feeding level and growth rate required, feed a milk replacer containing 20-26% protein and 16-20% oil. If feeding calves a higher amount of milk solids for increased growth, then milk replacers with a higher protein content (26%) and limited fat content (16%) will help promote lean tissue growth and limit body fat.

In addition to milk, water and calf starter from day three are essential for rumen development. Water contained in milk is not enough because milk bypasses the rumen in healthy calves. For each 1kg of concentrate consumed, a calf drinks 4-5 litres of water.

High quality calf starter is key, typically



containing 12MJ energy, 18-20% crude protein and at least 25% starch and sugar with the necessary vitamins and minerals, and enough fibre to avoid digestive upsets. From 3-5 days, offer calf starter in small amounts each day and remove leftovers, to help ensure it is always fresh and dry. Increase the amount gradually to achieve the weaning minimum of 1kg calf starter per calf per day.

Measuring growth

The only way to ensure calves are reaching targets, and to reduce the variation within groups, is to regularly measure and monitor growth rates:

- Set growth targets for your farm based on the mature body weight of cows in the herd (lactation 3+) – aim for 55-60% mature body weight at first breeding.
- Measure calves at birth, and again when heifers are handled, for example for vaccination, worming or insemination.
- Use weigh scales in a race or crush, or use a weigh band (girth tape).
- Use the same measure consistently so that you can benchmark your results.

Although calving heifers for the first time at 23-25 months of age has long term benefits in terms of fertility, milk production and survival, it is important that individual farms set a target first calving age to suit their system.

Whether this is 24 months or 26 months – a goal needs to be set, and heifers must be monitored throughout the rearing period to ensure they are on track for reaching the target. A proactive approach is essential from day one – it is not enough to simply hope that the newborn heifer calf will eventually enter the herd at any age. ■

*References are available
from the author on request*