

Dairy heifers – ensuring a fast start in order to maximise lifetime profit

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Maximising lifetime profit per cow – a good measure of a dairy operation is overall profitability – requires diligence at all stages, starting at birth. What happens in the first nine weeks of life can set heifers up for long term success.

Cow turnover is a part of every modern dairy. Herd replacements present the opportunity to improve genetics and increase production. It is important to raise calves that both assure the opportunity to become a contributing part of the herd and to do so in a manner that maximises the number of days a cow spends in production (lactation) versus growth to first calving and dry periods.

Multiple studies have shown that reducing the age of first calving from 24-25 months down to 22.5-23.5 improves lifetime profitability. Data interpreted from Changhee Do et al. demonstrates how lifetime profitability peaks around a first calving age of 23 months (Fig. 1). Thereafter, as age to first calving increases, the net return per cow decreases.

Maximising cow potential

In order for profitability to be improved with earlier first calving age, heifers must

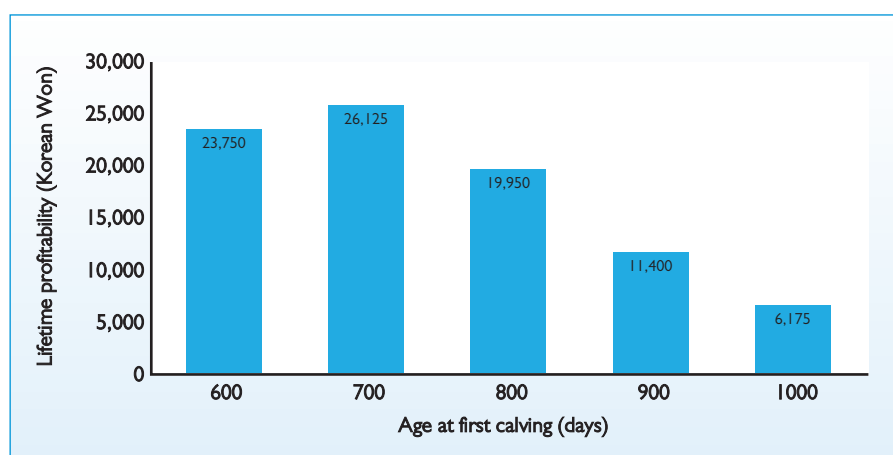


Fig. 1. Days to first calving effects upon lifetime profitability (Changhee Do et al., 2013.)

reach that age in a condition that allows good milk production and – just as in later lactating cows – should not be overly heavy or light in weight.

Age is less important than body weight and height at the time of first breeding. In Holsteins the recommendation is weight around 350kg and a height of approximately 120cm. It is important the growth be in both frame size and in lean muscle growth rather than adipose tissue.

Dairy cattle breeds obviously carry less muscle than do beef or dual-purpose breeds. In part we have selected them to maximise milk rather than muscle:

maintaining more muscle than needed would represent a loss in efficiency.

However, it is equally important that we raise our heifers to provide adequate muscle. In dairy cows the skeletal muscle system not only represents a method of movement but also acts as a reservoir of nutrients.

Particularly in early lactation when feed intake does not meet the needs of the cow, muscle protein is used to not only provide amino acid for protein production but also the carbon backbone for production of glucose through gluconeogenesis.

Calf rearing programs

Currently there are a number of calf-rearing programs proposed to increase this early growth. Programs that maximise this growth and wean calves on less expensive dry feeds provide for better long-term growth. Increased average daily gain (ADG) pre-weaning can increase subsequent milk production, as shown in Table 1.

Calf rearing requires attention to details to reduce morbidity and mortality among calves. One of the keys to success is getting calves to eat consistently and convert from consuming milk to consuming dry feed, i.e. calf starter.

Table 1. Predicted differences in production (kg) for 1st, 2nd, and 3rd lactation as well as cumulative milk from 1st through 3rd lactation as a function of pre-weaning average daily gain and energy intake over predicted maintenance for the Cornell herd (M. E. Van Amburgh, et al., Cornell University, New York 2014).

Lactation	No.	Predicted difference in milk ^a	P value	Predicted difference in milk ^b	P value
1st	1244	85	<0.01	236	<0.01
2nd	826	88.8	<0.01	109	0.26
3rd	450	4.8	0.91	352	<0.01
1st – 3rd	450	228	0.01	905	<0.01

^aper 100g of pre-weaning ADG ^bper kg for each additional Mcal intake energy above maintenance

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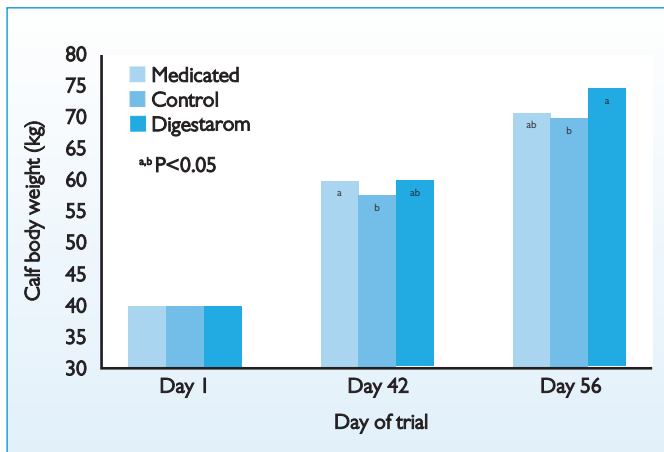


Fig. 2. Comparison of non-medicated, medicated (neomycin/ oxytetracycline) and Digestaron in calf milk replacers (Chester-Jones, et al., 2010).

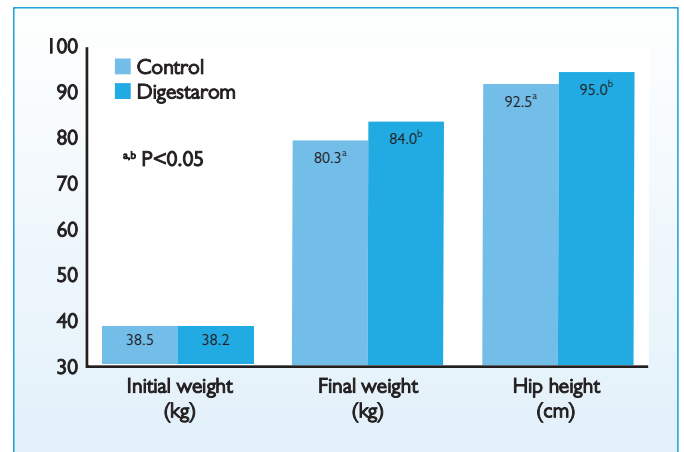


Fig. 3. Increased weight gain and hip heights from the inclusion of Digestaron over a 72-day feeding period (Biomim).

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Feed consumption and health are well correlated. Calves that eat more tend to be healthier and healthier calves tend to eat more. Regardless of which one may precede the other, the goal is the same. Along these lines antibiotics have often been included in milk replacers. However, consumers in many places have voiced strong concern about sub-therapeutic antibiotics in dairy and livestock production.

In a growing number of countries the use

of antibiotic growth promoters has been banned – in part reflecting consequent greater antibiotic-resistance in bacteria.

Ways to improve growth

Fortunately today we have other options to help maintain health, increase intake and improve performance. Selected phyto-genic feed additives have proven to be an effective part of a calf-rearing program.

Research conducted at the University of Minnesota demonstrated that calves receiving calf milk replacer (CMR) containing Digestaron performed equal to or better than that containing medication (Fig. 2).

In addition to increased body weight, calves receiving Digestaron also had significantly ($P < 0.05$) improved feed conversion rate over non-medicated feeds and a numeric improvement over medicated feeds.

Calves receiving Digestaron milk replacer had reduced medication costs vs. calves receiving either non-medicated or medicated feed.

Additionally, Digestaron, for application in either milk or calf starter, has been demonstrated to improve calf feed intake and performance.

In a study conducted at a commercial farm in the United States, Digestaron improved the growing performance of Holstein heifer calves, as shown in Fig. 3. According to Cornell's data on future milk production based upon weaning growth rate, this trial would predict 60 additional kg of milk during the first lactation.

In a study conducted with Digestaron in Austria calves demonstrated an improved growth rate of 100g per day. If such results were translated in dairy calves the increased milk production through three lactations would be 228kg of milk.

Summary

Early calf growth is important for long term profitability through a combination of improving the calf physiologically to support subsequent lactations and by increasing the number of lifetime days in lactation. Digestaron can help improve growth that can result in increased milk production. ■

References are available from the author on request