Calf heifer programmes: shaping the right future for your herd

Several scientific publications have proven the positive relationship between early phases of heifer rearing and performances of the adult cow. For example, a famous meta-analysis of Soberon & Van Amburgh has concluded that 'for every kilogram of pre-weaning average daily gain, calves produced 1,551kg more milk during first lactation'.

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The pre-weaning period is critical, because it is a period of development for the organs: no compensatory growth occurs at this time. It means that a delay then will not be caught up. If the rumen does not develop well at that time, its mature size might be affected, as well as the intake capacity of the adult cow. This phenomenon is even more critical with modern high genetics HF cows: genetic potential has to be expressed not to remain virtual.

If the early phases of development of the calves are not well managed, a part of this potential will vanish and this will lead to disappointment and loss of money for the farmer.

Early growth is also an important factor to reduce the age at first calving. Earlier calving is a very efficient way to reduce the cost of heifer rearing: reducing the heifer raising period from 24 months to 23 months saves approximately $93 per heifer.

Table 1. The number of taste buds of different species (Kare, 1966).

Species	Number of taste buds
Chicken	24
Pigeon	37
Cat	473
Dog	1706
Human	9,000
Pig/goat	15,000
Rabbit	17,000
Calf	25,000

Calf starter and rumen development

Calf starter plays a major role in this pre-weaning phase. When milk bypasses the rumen and goes directly in the abomasum, calf starter reaches it, where it initiates fermentations. This has a strong positive effect on the installation of the rumen microbial population, which is so important for ruminants.

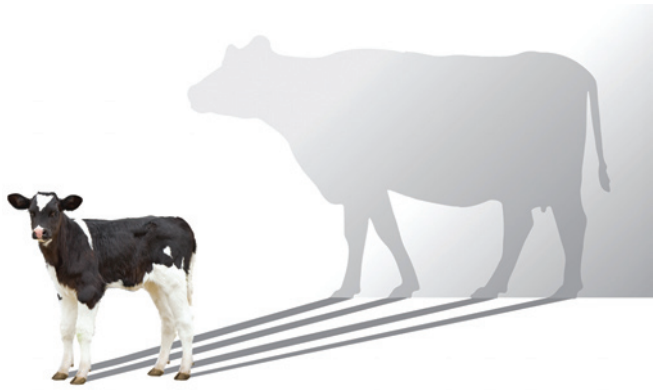
Those fermentations produce volatile fatty acids, which are absorbed through the rumen wall and thus stimulate early development of rumen papillas.

Classic trials at Cornell University have shown that concentrate promotes this development, when forage has almost no effect on that point. The formulation of calf starter should be specific to promote rumen development, including specific selection of nutrients. Micro-nutrients, such as vitamins, trace elements and anti-oxidants favour good immunity and vitality of calves. The objective of this formulation is also to prepare the transition after weaning, which is a critical period and source of stress for the calf.

Palatability is also a key factor of success for calf starter. The use of a powerful sweetener is key to stimulate the intake of calf starter, as calves are really sensitive to taste and enjoy sweetness. They indeed have a huge number of taste buds (see Table 1). This preference for sweetness per se could reflect a strategy to obtain dietary energy.

High quality milk replacer

The use of a good quality milk replacer remains the best option for the dairy farmer in a 'normal' market situation. As modern Holstein cows have been intensively selected for decades, their milk is probably no longer the best meal for young dairy calves that have to be weaned early: for example, the fat:protein ratio and balance of micro-nutrients are not optimal for them. A good quality milk replacer should be highly digestible, well balanced in amino acids and trace-elements, highly palatable and free from anti-nutritional factors.



It should also help to promote the early consumption of solid feed, which is the golden criteria for smooth weaning. The use of soluble milk proteins allows smooth curds in the abomasum and quick digestion of milk which promotes appetite for solid feed. To provide high security and compensate for a comparatively lower production of lactic acid in the abomasum than high casein milk, a wise combination of organic acids allows the pH in the intestine to decrease and prevent the development of bacteria.

Targets of a calf-heifer programme

A good calf-heifer programme aims to improve heifer health, by decreasing digestive troubles, optimising growth by fulfilling nutritional requirements and fostering the rumen development. The objectives of the farmers can be more specific: early weaning, to save time and money, or maximum performance, in accordance with premium quality genetics.

Experts at Wisium have taken into account all the important points for a successful rearing phase of dairy heifers and, through their Nursy programmes, offer different options to the dairy farmer, depending on the strategy they wish to adopt.

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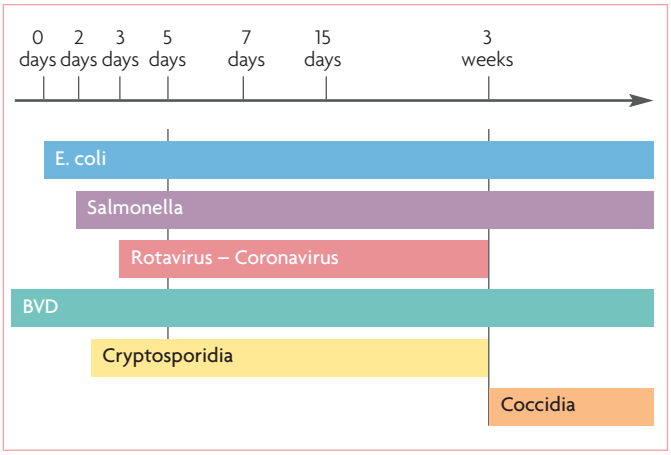
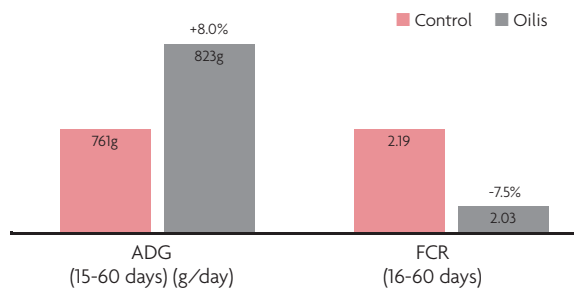
Fig. 1. Chronology of diarrhoeas in calves.





	Control	Oilis
Number of animals	18	18
Initial body weight at 15 days (kg)	50.7	50.9
Final body weight at 60 days (kg)	86.2	90.3
Average number of days	46.7	47.87
ADG (15-60 days)	761	823
Average milk replacer and starter feed consumption (kg/calf/day)	1/0.67	1/0.67
Estimated FCR	2.194	2.029

Fig. 2. Field trial with replacement calves in Poland, 2010.

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Nursy nutritional programmes propose a complete and packaged solution dedicated to heifers, with three options:

- Flex, for a classical programme focusing on security.
- Quick, for an early weaning programme.
- Advance, for the highest performance programme.

These programmes are based on a combination of Nursy specific starter feeds and associated highly digestible Newean milk replacers. Different additives included in these programmes are very helpful to improve the performance of calves and address some specific issues.

For example, a trial done in Mexico with the Nursy Flex programme showed a significant improvement of rumen development compared to a standard programme, with 1cm more length and 5cm more width after 30 days of life and 6cm more length and 1.5cm more width after 60 days (2x2 calves were sacrificed after each period).

Oilis, a unique association of plant extracts

Coccidiosis is an important issue for calves. It is a growing pathology due to some protozoa, Eimeria, which are parasites of the intestinal tract. They develop inside the calf's intestinal epithelium, and cause severe damage to enterocytes.

Absorption of nutrients is then significantly decreased, leading to growth delays, which can be irreversible at this early stage.

The main symptoms of this disease are diarrhoeas occurring after three weeks of age, without an increase in body temperature. Indeed, diarrhoea occurs at the end of the reproductive cycle of Eimeria, taking place in the large intestine. Earlier diarrhoeas can be caused by other pathogens, but not coccidiosis (see Fig. 1).

Oilis is a unique association of four plant extracts, which have been selected for their synergistic action in the gut. Contrary to medical treatment, phytotherapy solutions do not induce resistance or the risk of cross contamination in the production plant, which could be fatal for some species.

Several trials have shown a reduction in the excretion of oocysts with the use of Oilis.

For example, one trial done in mid west France on 135 veal calves showed a strong reduction of oocysts at the excretion peak: average excretion for the control group was over 15,000 per/g of faeces vs less than 1,100 for the Oilis group, and the number of positive animals reduced (-30%).

Despite the fact that Eimeria strains are numerous and specific to each species, Oilis has showed positive results on sheep, goats and poultry.

This association of plant extracts also allows better growth in several trials, which is important in those early stages of life. For example, a trial on replacement calves showed better growth performances for a group supplemented with Oilis vs a non-supplemented one (see Fig. 2).

Finally, for modern cows, optimisation of performance and valorisation of genetics requires an adapted and technical calf heifer rearing programme.

Nursy programmes offer efficient solutions adapted for different objectives of farmers. A synergistic combination of efficient additives, such as in Oilis, combines both security and performance. ■

References are available from the author on request