Supporting pre-weaning challenges in veal and replacement calves

In cattle farming, pre-weaning is a critical phase. During the first months of their life, young calves are prone to numerous stresses and challenges. Risks are increased by the fact that their digestive system is not fully developed and their immune system is still immature.

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In conventional farming systems, two types of calves have to undergo this challenging period: Veal Calves (VC) and Replacement Calves (RC). The first type is reared to produce veal meat and the second type is destined to become either a milking cow or a young bull. Breeding and feeding practices are slightly different between the two types of animal.

The first objective of this article is to state the breeding management differences and similarities between the VC and the RC.

The second objective is to explain how XTRACT 6930 and its water soluble version: XTRACT Instant, two products consisting of a blend of carvacrol, capsicum oleoresin and cinnamaldehyde are suitable tools for supporting both types of calves in facing the pre-weaning challenge.

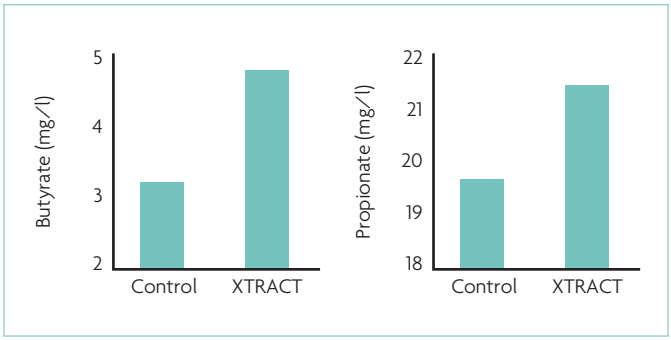

Fig. 2. Ruminal propionate and butyrate concentrations.

Breeding practices

● **Veal calf**

Veal calves are commonly raised for five months with the objective to reach the desired body weight (around 220kg) as fast as possible. The key breeding parameters are thus the breeding time, the Body Weight Gain (BWG) and the Feed Conversion Ratio (FCR). In order to achieve these targets VC are commonly fed with Milk Replacer (MR) and a little bit of roughage is provided. The milk replacer is provided once or twice a day. The roughage supply is limited in order to avoid meat colouration which is undesirable in some markets such as France, Belgium, the Netherlands and Spain. The veal calf is never weaned: it is slaughtered before it reaches this stage.

● **Replacement calf**

The replacement calf's target is different from VC. Its aim is to become the new generation of the herd. Pre-weaning success will thus have a major impact on the future economic security of the farm. In fact it has been scientifically established that nutrition and management during the early life can have long term effects on the lactation performance of dairy cows.

Practically speaking the RC has to be weaned when it reaches 13% of its mature Body Weight (BW) and has to possess a well-developed digestive system (especially the rumen). Under standard practices, the RC achieves its weaning BW (85kg) at around 56 days of age. The key breeding parameters are thus calf BWG, Feed Intake (FI) and digestive system development.

During pre-weaning, FCR is of secondary importance. The replacement calf is fed a limited amount of MR and feed concentrate is provided ad libitum in order to stimulate dry matter ingestion. Indeed it has been demonstrated that early dry matter ingestion promotes rumen development and facilitates transition from liquid feed to solid diet.

Similarities

Although the management practices and final targets are different, the under-developed digestive tract and the immature immune system are common to both VC and RC. They are thus both highly sensitive to metabolic and infectious diseases. For example, diarrhoea and respiratory infections are the two most important causes of calf mortality during pre-weaning. The parameters of success shared by both the VC and the RC are feed

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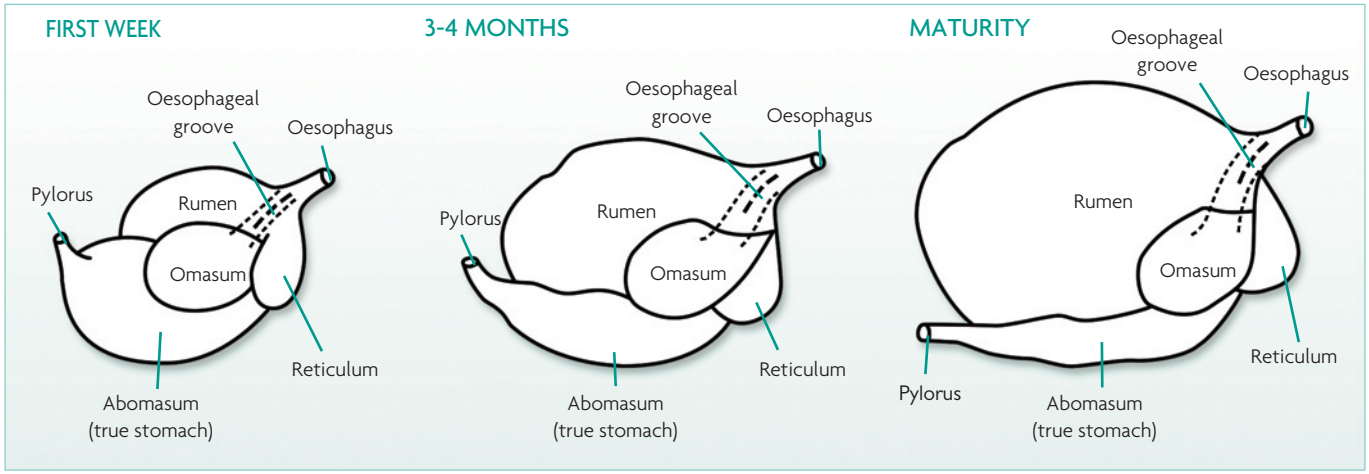
Fig. 1. Development of bovine stomach compartments from birth to maturity.



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intake, body weight gain and of course
disease incidence.

XTRACT possesses two applications: in the milk replacer with XTRACT Instant and in the feed concentrate with XTRACT 6930. For VC, the most appropriate application is in the milk replacer (115mg/calf/d) using XTRACT Instant. For RC the results are more consistent with a double supplementation: in the milk replacer (115mg/calf/d) and the feed concentrate (100g/ton of feed).

Digestive system

An improvement of calf digestive system is a characteristic observed in RC receiving XTRACT. Indicators of rumen papillae development, such as higher ruminal concentration of propionate (+10.3%) and butyrate (+39.0%) were exhibited by RC fed XTRACT supplemented diet (Fig. 2).

These results suggest that calves were prone to rapid digestive system development, including the rumen. Additional results in VC confirm this positive effect of XTRACT on the digestive system. Significant higher milk intake rates were shown in XTRACT supplemented calves: 22 seconds/litre in comparison with 30 seconds/litre for calves fed a non-supplemented diet (Fig. 3).

	Control	XTRACT	Variation
Final body weight (kg at 20 weeks)	215.51[a]	224.86[b]	+4.3%
Daily weight gain (kg/day)	1.192[a]	1.256[b]	+5.4%
Feed conversion ratio (kg/kg)	1.572	1.523	-3.1%

Table 1. Veal calf growth performance comparison between treatments ([a, b] P<0.05).

Health parameters

Health improvement is also an element observed when XTRACT is supplemented in calves. This result was observed in both VC and RC. Replacement calves had lower medication costs (-25%) in comparison to calves fed with the standard diet. For VC improvement in the health status was observed by a numerical reduction in mortality when the animals received XTRACT supplemented milk replacer.

Growth performance

Improvement in zootechnical parameters is of great importance for both VC and RC. However what makes XTRACT different from competitor products is its ability to act at the physiological level. Thus growth improvement is only the consequence of the product's positive actions on metabolism.

Experimental data are consistent with XTRACT's ability to enhance growth in young ruminants. For example, veal calves receiving XTRACT in milk replacer show significant improvement (P<0.05) in feed intake (+2.4%), daily weight gain (+5.4%) and in the FCR (-3.1%) in comparison to VC fed standard milk replacer. Results are presented in Table 1.

Replacement calves receiving XTRACT in the milk replacer and in the feed concentrate exhibited significant increase (P<0.05) in feed concentrate intake (+26.4%) and a numerical improvement in daily weight gain (+8.1%) (Fig. 4).

Thus, XTRACT supplementation is a good tool to answer the breeding challenges of VC and RC during pre-weaning: high feed intake, good growth performance and reduced morbidity. A positive action on the digestive system development is also exhibited, which is a critical parameter for the future performance of replacement calves.

Summary

- Veal calf and replacement calf have both under developed digestive systems, immature immune systems and undergo a very challenging rearing phase: pre-weaning.
- What makes XTRACT different from competitor products is its ability to act at the physiological level: digestive system development and health improvement.
- Improvements in calf growth performance are the consequences of the product's positive action on metabolism.
- For veal calves, the best application is in the milk replacer using XTRACT Instant.
- For replacement calves, the best application is in the milk replacer using XTRACT Instant, and XTRACT 6930 in the feed concentrate. ■

Fig. 3. Veal calf milk intake rate.

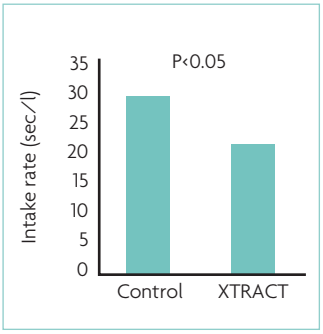

Fig. 4. Replacement calf body weight gain and solid feed intake.