Plant extracts promote growth and rumen development in calves

Calves are the future of the herd and, in dairy production, a newborn calf is the result of a genetic improvement within a dairy cow lineage. To get the best out of the genetic improvement and ensure the future of your dairy herd, it is important to pay attention to the critical first weeks of life.

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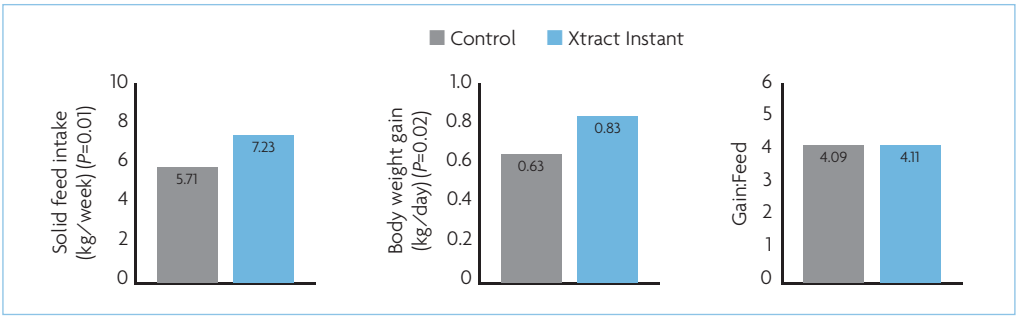


Fig. 2. Calves supplemented with plant extracts show increased average daily weight gain and higher feed intake.

Under current husbandry conditions, calves experience many stress factors during their first weeks of life, such as separation from the mother, dietary changes, transportation and exposure to a variety of infectious agents. Diarrhoea is the main cause of mortality in the first 30 days of age, followed by respiratory diseases, mainly pneumonia (National Animal Health Monitoring System 2016).

As a consequence of these challenging situations, animals reduce their intake and their growth is negatively impacted due to a decrease in nutrient absorption. Moreover, medication costs lead to additional economic losses.

During this challenging period, the animal's immune system is weakened, the gut barrier function may be impaired and the microbial gut flora imbalanced. Until now, antimicrobial growth promoters (AGPs) were largely used to protect calves against these challenges. However, many countries have banned the use of antibiotics as AGPs to prevent the occurrence of bacteria resistance and to ensure the future efficacy of veterinary and human medicine. Therefore, finding alternatives to AGPs is necessary to secure the optimal growth and health of neonatal calves.

Plant extracts as an alternative to AGPs

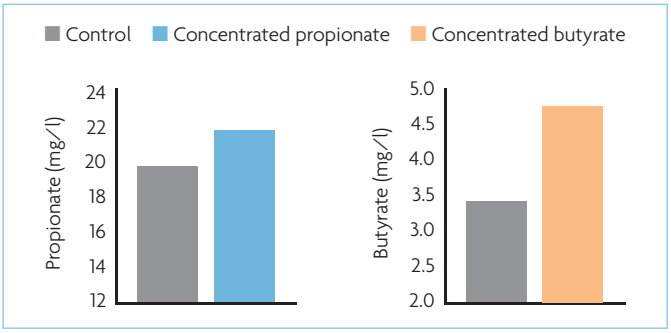
As a new alternative to AGPs, plant extracts have been shown to preserve gut integrity and improve animal resilience. They can trigger specific receptors inducing a host response.

Pancosma, an internationally-renowned Swiss company and pioneer in the development of products based on plant extracts, has identified a blend of compounds made from cinnamon, oregano and chili peppers that has beneficial properties for improving feed intake and digestion.

For newborn calves, their management during early life can have long term effects on the lactation performance of dairy cows.

Dairy calves are weaned when reaching 13% of their mature bodyweight, approximately around eight weeks of age. During this specific period, however, feed efficiency should not be the main focus; parameters such as bodyweight gain, feed intake and rumen development will be key to determining the success of the herd later on. Supplementation with plant extracts can be provided using milk replacers but also in the starter feed for the transition from liquid to solid feed.

Fig. 1. Ruminal concentration of volatile fatty acids (VFAs).



Improved performance and supported feed intake

A study was performed in Germany to test the effect on performance and the rumen parameters of weaning calves by adding a blend of compounds made from cinnamon, oregano and chili peppers to the milk replacer and starter feed.

Calves fed with plant extracts demonstrated an increase in final bodyweight of 4.3kg when compared to the control ($P<0.1$). In the same study, results showed a significantly higher concentrate intake (+26.4%; $P<0.05$) for the entire duration of the trial. Moreover, calves fed with plant extracts had a higher ruminal concentration of propionate and butyrate of +10.3% and +39.0% respectively (see Fig. 1). The ruminal concentration of acetate was similar between the two groups.

Propionate and butyrate are known to be promoters of rumen papillae development. This suggests that calves supplemented with a blend of compounds from cinnamon, oregano and chili peppers are more prone to earlier rumen development.

A second experiment was conducted to assess the effect of a blend of compounds made from cinnamon, oregano and chili peppers on the performance of milk-fed calves. Plant extracts were added to milk replacers. Calves that were supplemented with plant extracts showed increased average daily weight gain and higher feed intake (Fig. 2) compared to calves in the control group. Feed efficiency was not affected by treatment.

Conclusion

Heifer calves are the future of the performance of the dairy herd and so it is important to pay special attention to ensure optimal growth performance and health status.

AGPs are currently used to protect calves from digestive and respiratory diseases. However, plant extracts may represent a safe alternative to AGPs. Supplementation with plant extracts may lead to an increase in average daily weight gain, which also has implications in decreasing animal rearing costs. In addition, the increase in starter feed intake may enhance rumen development and subsequent overall animal performance. ■