The impact of intestinal inflammation and oxidative stress on milk production

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Intestinal inflammation and oxidative stress have been the focus of research in recent years and are actually a source of concern for nutritionists and veterinarians. The main risky situations are the peri-partum critical period, the high producing cows and the acidogenicity of the diet.

Not always detected with clinical observations, inflammation and oxidative stress consume energy and proteins for production of the immune response, and then decrease the nutrients availability for production purposes.

Consequently, the direct effect of intestinal inflammation and oxidative stress is to decrease potential milk production through decreased feed valorisation.

Then, an indirect effect can be an increase of fat mobilisation, and thus a potential detrimental effect on future fertility. Finally, sensitivity to diseases can be highlighted.

Powerjet is a feed additive, patented by Neovia, which is made of three plant extracts (Sanguinarine, Magnolol and Honokiol). All of them have been selected for their anti-inflammatory abilities and the combination demonstrates a synergistic effect.

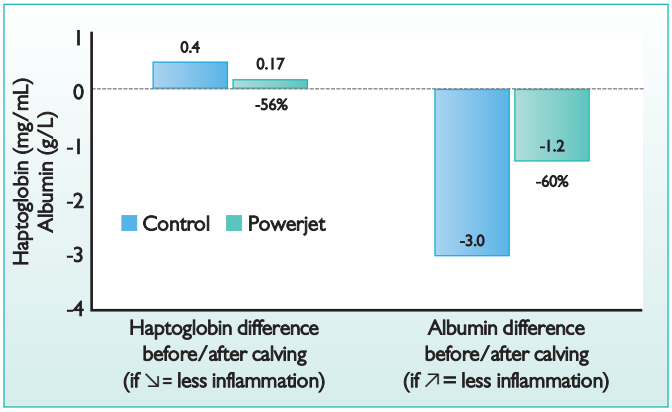

Fig. 1. Haptoglobin and albumin evolution around calving.

In vivo trials have proved the positive influence of the modulation of inflammation and oxidative stress on production parameters.

French trial

One of the trials was set up in France in 2013 with high producing dairy cows during the peri-partum period (herd of 80 Prim Holstein cows with an average production of more than 10,000kg per cow per lactation).

The control group (12 cows) received the basal diet and the trial group (13 cows) was fed with the basal diet and Powerjet from three weeks before farrowing until three months after calving. Different inflammation and oxidative stress markers were analysed in blood, one week before calving and one week after calving. Milk production parameters were also recorded.

Results on inflammation markers before and after calving demonstrate a lower increase in the haptoglobin level (protein more synthesised in case of inflammation) by -56% for animals supplemented with Powerjet and a lower reduction of the albumin level (protein less synthesised in case of inflammation) by 60% for animals supplemented with Powerjet.

In conclusion, the global level of inflammation decreased for these animals.

In parallel, the d-ROM production level (free radicals production in case of oxidative stress) one week after calving was 8.3% lower in the Powerjet group illustrating the reduction of oxidative stress.

Looking at reserves mobilisation parameters, the analysis of NEFA (Non Esterified Fatty Acids) and BHB blood levels one week after calving were respectively 28% and 30% lower in the Powerjet group proving a reduction of fat mobilisation. Moreover, milk production was significantly increased by 2.3kg per cow per day.

Summary

In summary, Powerjet was able to positively influence and modulate inflammation and oxidative stress around calving and during the beginning of the lactation. Allowing animals to avoid metabolic deviation, lower fat mobilisation and higher milk production validate the results observed on physiologic and metabolic indicators.

Powerjet, through the synergy of three plant extracts, is an innovative feed additive that allows management of critical situations by acting on intestinal inflammation and oxidative stress. Powerjet reduces the physiological and metabolic deviances of the maintenance needs to improve production. ■

Fig. 2. d-ROM level one week after calving.

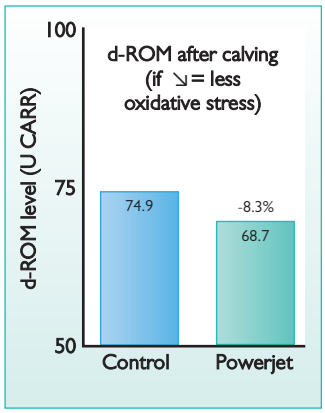

Fig. 3. NEFA (Non Esterified Fatty Acids) and BHB evolution around calving.

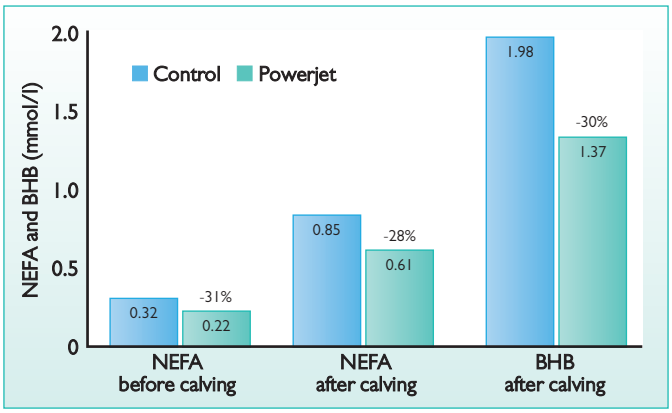

Fig. 4. Milk production results using Powerjet.