

Animal Nutrition Solutions



Bioflavex[®]



**Enhancing performance and
productivity, naturally**

Animal welfare in intensive production systems has become a growing concern in the public eye, and consequently for farmers and veterinarians as well. Additionally, we cannot forget its importance in terms of performance. The better the animal welfare, the better their physiological functions develop.

BIOFLAVEX®: **controlling eating** **habits** **and animal** **behaviour in** **fattening calves**



The concept of **animal welfare** covers from **physical aspects**, such as animal health, proper feeding and the absence of pain, to **psychological aspects** such as the expression of their innate behaviour, absence of fear and stress. As a result, through their health and certain behaviours, we can assess animal welfare objectively.

Fattening calves, fed with concentrate and straw in intensive production systems, spend much less time on feed intake than with a pasture-based feed regime. Eating habits are probably one of the most important behaviours and may favour the appearance of digestive disorders, while determining the appearance of other animal behaviour (competition at the feeder, aggressive behaviour, etc.).

The meal size and feeding frequency (number of meals per day) are parameters that determine the total daily feed intake and that directly influence fermentation and the ruminal pH. Smaller meal sizes combined with a higher feeding frequency guarantee more stable fermentations, reducing ruminal pH fluctuations and the risk of acidosis.

Aggressive and non-nutritional oral behaviour (licking or biting with no nutritional purpose) have been described as indicators of a lack of welfare, frustration, and discomfort in fattening calves. Along with sexual behaviour (mounting), these can cause serious injuries and increase the number of casualties, particularly during the finishing stage, due to the size and weight of the animals.

Bioflavex® is a natural product made of citrus flavonoids. Its use for ruminants has had beneficial effects on rumen fermentation, ruminal pH, and certain microbial populations at ruminal level, while also reducing methane emissions.

A study has been carried out with the aim of assessing how these **Bioflavex®** effects at the ruminal level can affect eating habits and animal behaviour in commercial fattening calf systems, thereby checking if this translates into an improvement in animal welfare.

Materials and methods

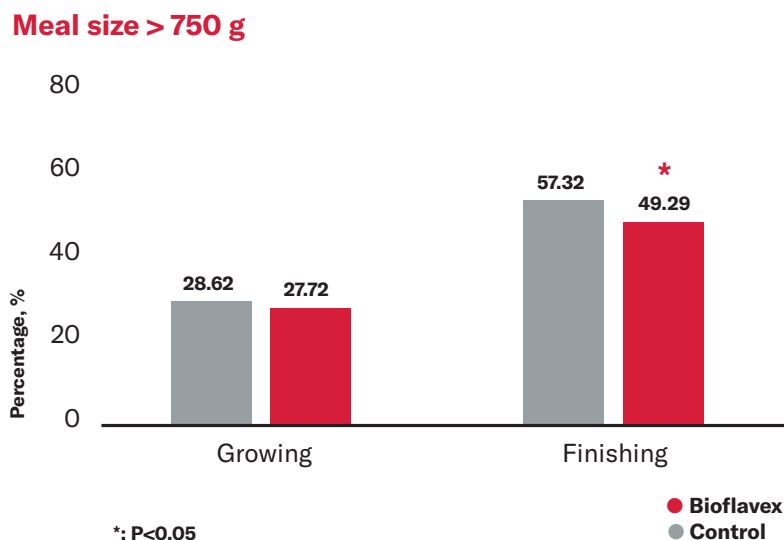
The trial was carried out on a **commercial farm** with an **individual tubular feeder** which dispenses the concentrate feed.

- The feeder is connected to a computer enabling individual recording of feeding behaviour in calves during the trial, via a chip attached to the animals' ears.
- Each pen has a drinker and a collective feeder for the straw.

Total No. of animals	198 Holstein calves of 150 days of life 20 animals/pen	Control (C)	99 calves Pelleted feed Growing diet: from 0d to 112d of the study Finishing diet: from 113d to end of study Straw and water <i>ad libitum</i>
Total No. of treatments	2 treatments	Treatment (Bx)	99 calves Pelleted feed + Bioflavex [®] (400 g/t feed) Growing diet: from 0d to 112d of the study Finishing diet: from 113d to end of study Straw and water <i>ad libitum</i>
Duration	168 days		
Parameters analysed	Eating behaviour (daily) Animal behaviour (every 14 days) Macroscopic ruminal epithelium study		

Results

Eating behaviour

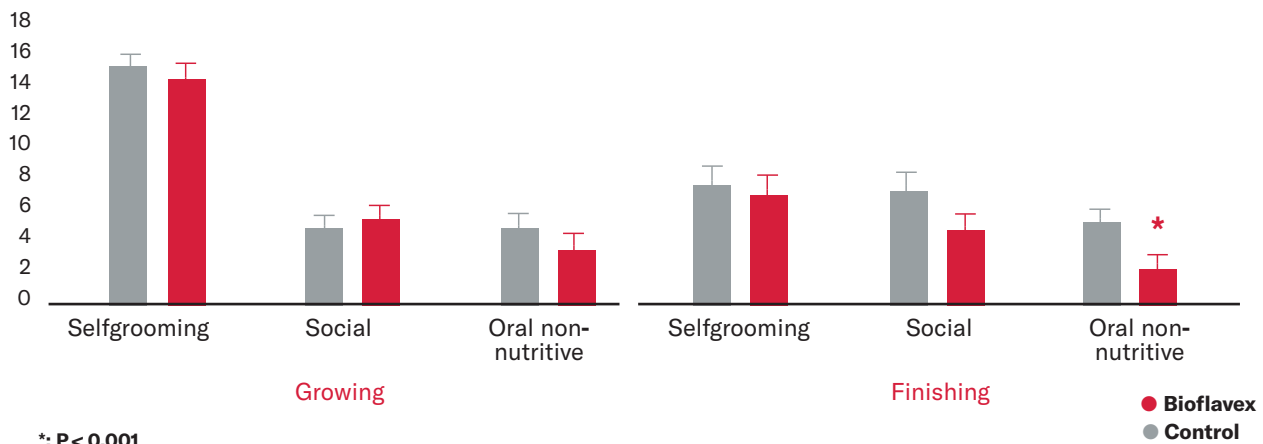


Calves fed with **Bioflavex**[®] showed a significant reduction ($P < 0.05$) in the number of meals larger than 750 g during the finishing period.

Results

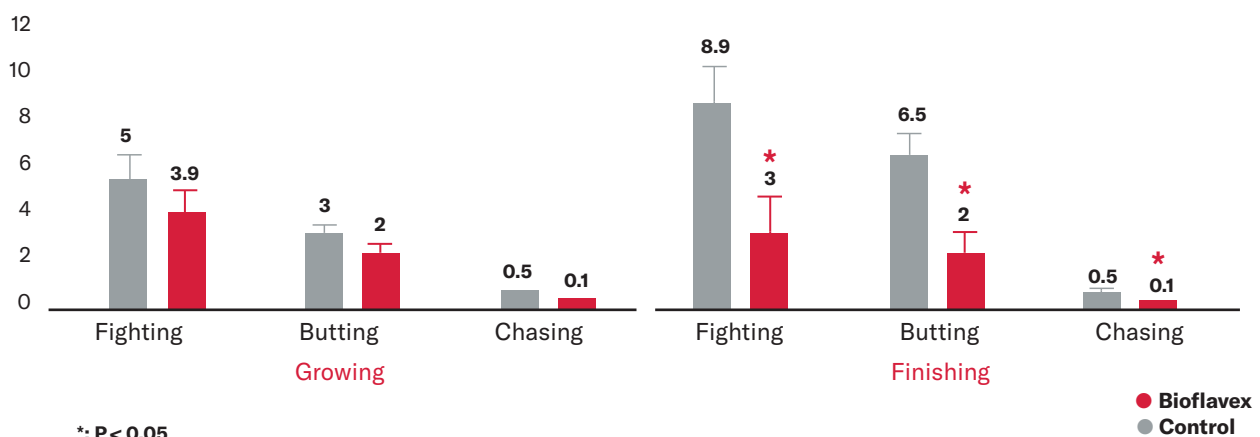
Animal behaviour

Non-agonistic behaviours



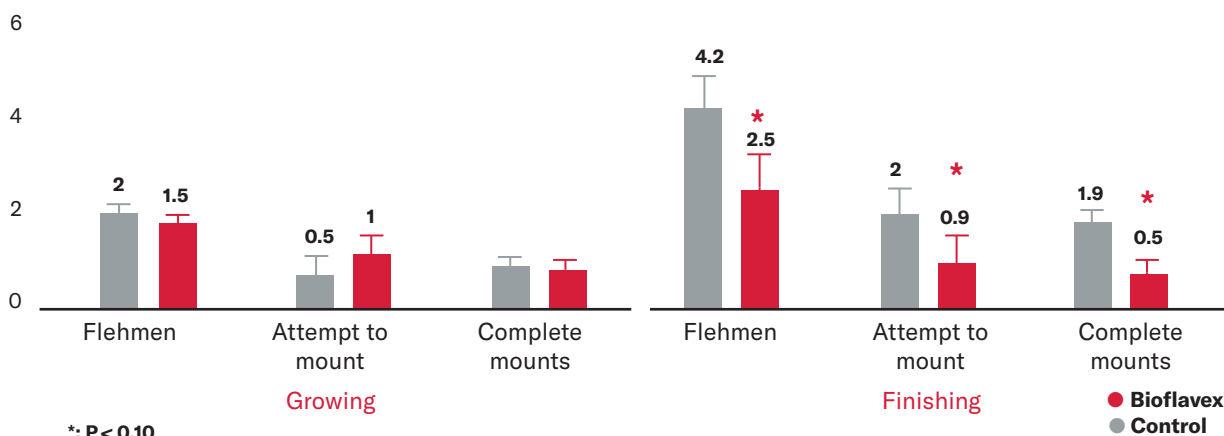
○ Calves fed with **Bioflavex**® showed less (P < 0.001) non-nutritional oral behaviours during the finishing period than animals in the control group.

Agonistic behaviours



○ Animals fed **Bioflavex**® showed less (P < 0.05) agonistic behaviours during the finishing period than the control group.

Sexual interactions

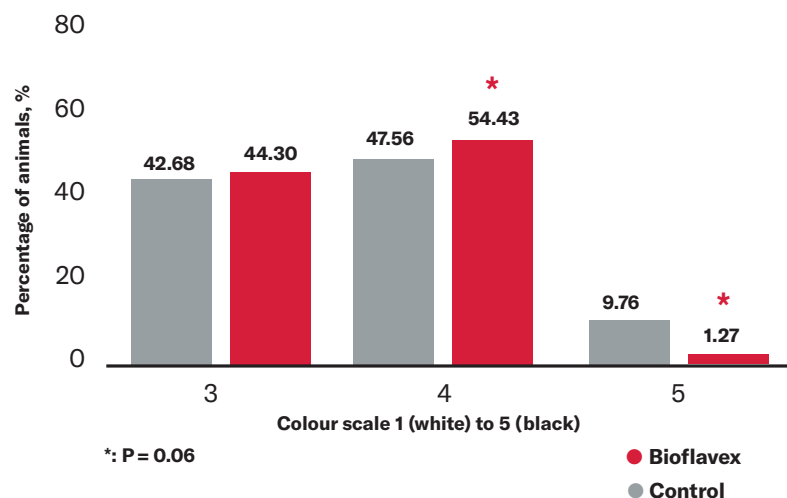


○ Sexual interactions (mounting, the Flehmen response) tended to decrease in animals fed with **Bioflavex**® during the finishing period in comparison to the control group.

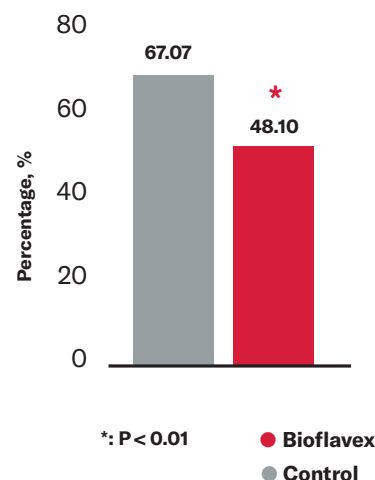
Results

Ruminal health

Ruminal epithelium colour



Areas without ruminal papillae



○ Although there is no information directly relating lighter colour of the ruminal epithelium to better ruminal health, darker colour would be the result of inflammation.

The ruminal epithelium colour tended (P = 0.06) to be clearer in the calves fed with **Bioflavex**[®]. The number of areas with no ruminal papillae presence was significantly lower (P < 0.01) in the **Bioflavex**[®] treatment.



Conclusions

The ruminal parameters analysed showed **better animal health with flavonoid supplementation**, possibly due to their antioxidant and anti-inflammatory properties.

Supplementation with **Bioflavex**[®] in calves reduced the percentage of meals above 750 g. By increasing the number of smaller meals per day, **Bioflavex**[®] improved animal behaviour, reducing agonistic and sexual interactions, and non-nutritional oral behaviour.

Bioflavex[®] modulates eating habits and behaviour in calves, improving animal welfare.



**Capturing
nature's power**

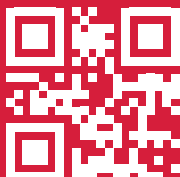
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40+ years of experience producing consumer-centric solutions in Functional Health, Pharmaceutical APIs, Taste Modulation, and Animal Nutrition. Adhering to the highest European manufacturing standards in sustainability, quality, and supply chain. Because there are no limits to nature when there is a team of passionate experts who know how to best harness its power.

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