

The microbiota-brain connection: the key to enhanced performance

Numerous publications show the various impacts that the microbiota has on the whole living being. When this flora is unbalanced, it leads to abdominal pain, psychological stress and therefore an alteration of the quality of life. As a consequence, top-performing animals do not reach their potential.

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Antibiotics as growth promoters were used to reduce opportunist microflora activity, but this also reduced microbiota diversity and interesting microflora activity.

By adopting a holistic approach to the animal, Phodé offer sensory solutions with original modes of action and proven efficacy.

Microbiota-brain connection

Gut health is essential for animal production. Bacteria present in the gut are closely linked to other systems, such as the immune system and the brain. The microbiota-gut-brain axis (Fig. 1) is a bidirectional homeostatic axis. It is now recognised that a dysfunction of this axis can lead to pathogenesis.

This symbiotic relation between host and bacteria is at the origin of an overall balance. When this balance is not optimal, modulation

of the stress response, behaviour and immunity can be altered.

Alteration of immunity is likely to lead to sickness (lower innate and adaptive immune response, and an increase in pro-inflammatory cytokines in plasma). The microflora also impacts the brain by controlling the concentration of various neurotransmitters, affecting behaviour.

In modern farming, dysbiosis (unbalanced microbiota) may occur at different stages of production. It can be caused by farm management, feed transitions, psychological or physical stress, sickness or antibiotics, etc.

When an animal faces dysbiosis, it is possible to restore the optimal gut health status within three weeks. During this time, the economic loss will not be recovered. Obviously, the use of preventive methods to maintain digestive tract homeostasis is a key driver for performance.

Phodé's concept

Phodé considers 'Better-Being' in animal farming as the cornerstone for reaching optimum performance. The microbiota-gut-brain axis is a unique system called the 'cerebral ecosystem'.

Based on this original approach, Phodé offers specific and innovative solutions adapted to modern farming expectations.

Oleobiotec is an exclusive blend of essential oils and spice extracts designed to optimise transmission of the 'Better-Being' message through the microbiota-brain connection.

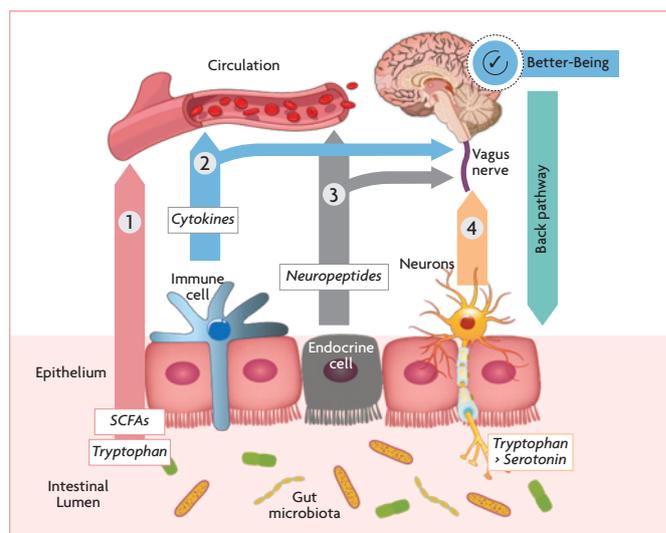


Fig. 1. The microbiota-brain connection.

A naturally inspired solution

Essential oils and spices are widely known in human medicine and are also used in animal medicine. They regulate microflora and stimulate the secretion of enzymes, gastric juices and motility of the gut.

Firstly, the action of an essential oil depends on its chemotype defined by nature: the plant, the area where it was grown, the season and other factors.

Phodé draws on 20 years of expertise to carefully select active ingredients and create unique solutions.

The company guarantees consistent and effective solutions,

thanks to a sourcing commitment and strict quality standards.

Secondly, Phodé's expertise and know-how foster enhanced efficacy, combining natural active compounds in order to benefit from their synergistic effects.

Each species has its own gut microbiota. Specific products were thus created to offer solutions for poultry, swine and ruminants. For the last 10 years, over 30 trials have been conducted with scientific partners, commercial partners and customers around the world.

Laying performance and egg shell quality

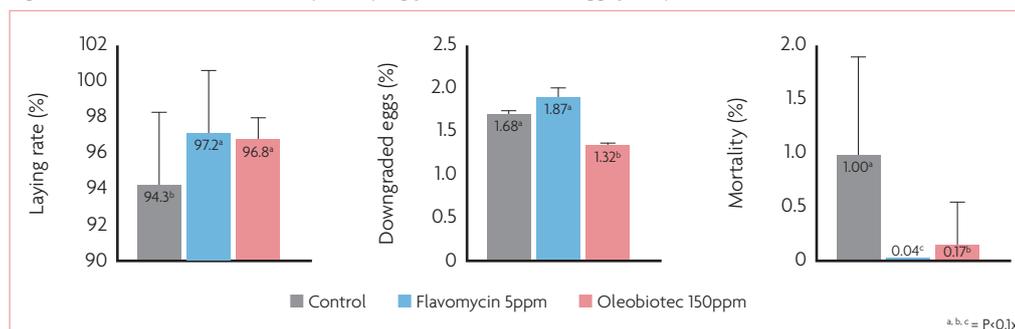
Oleobiotec Poultry has been successfully used with a view to replace growth promoters in laying production.

For example, in an experimental station in Mexico, three groups of 216 Bovans White hens were distributed into 12 cages each (n=12) at 16 weeks of age for 12 weeks (first period of laying). Climate was very unstable from 15-34°C with a high RH of 82%.

The first group was a negative control, the second a positive control with 5ppm of flavomycin on

Continued on page 13

Fig. 2. Effect of Oleobiotec Poultry on laying performance and egg quality.



Type of treatment n = 6 x 24	Feed intake	Live weight	FCR
Standard specifications + BMD 55ppm	4447 ± 29	2568 ± 22 ^a	1.740 ± 0.062
Low specifications (-2.5%) + BMD 55ppm	4417 ± 25	2484 ± 23 ^b	1.774 ± 0.076
Low specifications (-2.5%) + Oleobiotec 100ppm	4398 ± 23	2553 ± 21 ^a	1.718 ± 0.052
P	0.231	<0.001	0.146

Table 1. Comparison of different diets with Oleobiotec Poultry and bacitracin methylene disalicylate (BMD) to balance a poor quality feed.

Continued from page 11
top of the feed, and the third group was the treatment group with Oleobiotec Poultry also on top of the feed (100ppm).

In these conditions, the laying rate was significantly increased compared to the negative control exhibiting no significant differences between flavomycin and Oleobiotec (Fig. 2). The feed conversion ratio was improved only by Oleobiotec. Mortality was also very low thanks to Oleobiotec compared to the control.

Better nutrient efficiency

Oleobiotec Poultry is also used to replace growth promoters in broiler

production. In an experimental farm in Canada, 432 one day old Ross 308 were placed into 6 pens x 3 treatments (18 pens x 24 birds). The positive control (T1) was formulated to conform to Ross specifications with 55ppm of bacitracin methylene disalicylate (BMD).

Treatments 2 (T2) and 3 (T3) were fed a low nutrient diet, where metabolisable energy, crude protein and amino acids were reduced by 2.5%. T2 diet included BMD (55ppm), and T3 included OLEO (100ppm).

There was no significant effect of treatment on FI (Table 1). Live BW was significantly lower ($P<0.001$) for T2 than T1 and T3. There was no significant effect on FCR, maybe due to the low number of replicates ($n=6$) for this indicator. The N and P

conversion ratios were significantly reduced ($p<0.05$) in T3 compared to T1 and T2 (Fig. 3). In both cases the increment of feed cost compared to growth promoter was widely balanced by the best performances due to Oleobiotec Poultry.

Conclusion

Phodé's product is a unique solution, proven effective in promoting the balance and diversity of the gut microbiota for 'Better-Being'.

Acting on the whole cerebral ecosystem is the key to help animals reach their full potential.

Ongoing research on plant extracts promise novel solutions in the future to combine animal performance and sustainability. Its original mode of action of balancing the microbiota will have a positive effect on the whole cerebral ecosystem, allowing animals to reach their potential through 'Better-Being'. ■

References are available from the author on request

Fig. 3. Nitrogen and phosphorous efficacy are improved with Oleobiotec Poultry.

