A natural alternative to poultry growth promoters

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ollowing the ban on antibiotic growth promoters (AGPs) in Europe, various solutions have come on to the market. The objective of such solutions must be to ensure a level of efficacy at least equivalent to that obtained with the products they are designed to replace, while preserving the animals' physiology in an environmentally friendly manner.

One of these solutions, based on plant extracts, essential oils and spices, has been developed for poultry production. Its objectives are to optimise feed intake and the digestive process as a whole to maximise feed utilisation, as well as to control pathogen development in the digestive tract.

Today, this natural solution has proven its value and numerous trials on broiler chickens and turkeys validate this innovative concept.

These trials, conducted either in research stations or on commercial farms, demonstrate that this plantbased complex (Oleobiotec) helps to attain zootechnical performance similar to that obtained with antibiotic growth promoters, with a positive impact on poultry survival.

In all animal production, performance and health are closely linked to nutrition, but also to the efficacy of the digestive process, responsible for the conversion of raw materials by the animal.

If we are able to optimise this process, we can contribute to optimising farm performance. Based on this idea, French Animal Nutrition company Phodé SA has developed a specific blend of essential oils and spices aimed at enhancing and securing poultry digestive functions.

Thanks to their complementary activities, these essential oils (oregano, thyme, cinnamon) and spices (ginger, turmeric, pepper) are able to act at various levels of the digestive process (Fig. 1).

Why use essential oils?

Today, the bactericidal activity of certain essential oils is well known and many scientific publications have investigated their modes of action. One of the principal modes of action of essential oils with bactericidal properties is directed against microbial membranes and cell walls. This specificity confers upon them a large spectrum of activity, targeting Gram positive and Gram negative bacteria, yeast or fungus, unlike most of the traditional antibiotics. When added continuously to the feed, the essential oils contained in Oleobiotec can help secure the digestive process and control the potential pathogenic microflora present in the digestive tract







Fig. 2. In vitro bactericidal activity of Oleobiotec versus antibiotics against some common chicken pathogens (Laboratoire d'Hygiène Départemental du Tarn, France, 1999-2001).

saicin from pepper. Their modes of

action are increasingly known.

The blend of spices present in

mulated for its activity at different

levels of the digestive process, from

feed intake to nutrients absorption

At the level of the taste buds, it is

responsible for the activation of the

heat receptors, which in turn stimu-

1The salivation (increased synthesis

1 The secretion of digestive juices in

1The secretion of gastric juices and

1 The secretion of bile and increase

in the level of biliary acids in the gas-

At the stomach level it increases

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late:

Oleobiotec has been specifically for-

In vitro studies have shown that the activity of Oleobiotec against the main pathogens affecting poultry (coliforms, campylobacter, S. typhimurium and C. perfringens) was comparable to the efficacy of commonly used antibiotics (Fig. 2).

Spices optimise digestion

In addition to their gustative qualities, spices are known for their effects on health and digestion. They are present in the traditional pharmacopoeia of many civilisations: Chinese or ayurvedic medicine for instance. They were even used in Ancient Egypt for their medicinal properties.

Today, many active compounds have been isolated from spices and characterised, such as piperine from peppercorn and 6-7-dihydrocap-

Table 1. Details of the five trials used in the first meta-analysis.

Trial	Total number of chickens	Age at slaughter (days)
Reference farm	50,000	42
Reference farm	64,000	42
Experimental station	1,000	39
Experimental station	I,080	37
Field trial	4,538,235	42
Total/average	4,654,315	40.4

Experiment	Total number of chickens	Age at slaughter (days)
Field trial	186,000	40.5
Field trial	360,000	37
Experimental station	1,000	39
Experimental station	1,080	37
Total/average	548,080	38.4

Table 2. Details of the four trials used in the second meta-analysis.

	Control + (AGP)	Oleobiotec	Р
Slaughter weight (40.4d)	2.081	2.103	NS*
Average daily weight gain (g/d)	50.5	50.9	NS
Feed consumption rate	1.876	1.865	NS <i>*P>0.05</i>

Table 3. Conclusions of the first meta-analysis: zootechnical performance with Oleobiotec versus a growth promoter.

	Control -	Oleobiotec	Р
Slaughter weight (40.4j) Average daily weight gain (g/d) Feed consumption rate *P>0.05	1.962 50.2 1.815	2.037 52.0 1.781	<0.001 0.001 NS*

 Table 4. Conclusion of the second meta-analysis: zootechnical performance with Oleobiotec versus. negative control.

Continued from page 15

At the gut level it increases permeability of the gut mucosa to improve nutrient absorption. By optimising the digestive process, the blend of spices contained in Oleobiotec helps improve feed valorisation. station and on production sites in different European countries. Two meta-analysis were con-

ducted. In the first meta-analysis, the results of five trials with Oleobiotec were measured against the performance obtained with a growth promoter (avilamycin, 10ppm, Table 1). The second meta-analysis com-

pares the results of four trials with

Oleobiotec against a negative con-

performed using the linear mixed

model on the Oleobiotec-control

variations (program SPSS, version

13.0, 2004). The observed data was

weighted according to the inverse of

trol (Table 2). Statistical analysis was

Aromatic compounds

In order to optimise feed intake, some aromatic compounds were selected that have a positive impact on poultry.

Various trials were conducted in broiler chickens, both in a research

Table 5. Summary of trial with Oleobiotec in BIG 6 strain turkeys at the University of Warmia and Mazury, Olsztyn, Poland (Phodé, 2005-2006).

Trial duration	Day 0-140		
Birds	4 x 25 per treatment, BIG 6 strain		
Treatment	Negative control Oleobiotec		
ADWG (g/d)	132.2	36.5	
FCR	2.91	2.8	
Mortality (%)	9	9	

Conclusions: Oleobiotec tends to diminish the feed consumption rate compared to control. Oleobiotec significantly improves turkey live weight at 12 weeks and tends to improve live weight at 16 and 20 weeks (Fig. 3)

Table 6. Summary of trial with Oleobiotec in BUT 9 female turkeys (Phodé, 2005-2006).

Trial duration Birds Treatment	996 p 8ppm Flavomycin	Day 0-42 er treatment, BUT 9 Oleobiotec	females Product X (plant extracts)
ADWG (g/d)	50.1	48.0	44.5
FCR	1.40	1.55	1.55
Mortality (%)	2.8	3.2	6.4

Conclusions: No significant difference between the effects of the promoter and Oleobiotic on growth performance and mortality. Oleobiotec improves growth performance and survival when compared to another product containing plant extracts.

Parameter	Negative control	Oleobiotec	Р	
Digesta pH (jejunum)	6.27	5.91	<0.05	
Digesta viscosity (mPas, ileum)	2.40	2.19	>0.05	
Alpha-glucosidase enzymatic activity (U/g of digesta, ileum)	0.16	0.53	<0.05	

Table 7. Effects of Oleobiotec on gastro-intestinal physiology of turkeys (Poultry Department of University of Warmia and Mazury, Olsztyn, Poland).

the variance of the difference.

The fixed effect component is the constant and the random effect component is the experiment.

The information criterion is the restricted maximum likelihood.

The results of the two meta-analysis are summarised in Tables 3 and 4.

The zootechnical performances obtained with the natural solution

pared to negative control or another feed additive based on essential oils. When comparing Oleobiotec to negative control, some improvements were measured concerning the turkeys gastrointestinal physiology:

• A significant decrease of jejunal pH.

• A numerical decrease of ileac digesta viscosity.



Fig. 3. Effects of various feed additives on the growth performance of turkeys (Poultry Department of University of Warmia and Mazury in Olsztyn, Poland).

Oleobiotec are similar to those attained with an antibiotic growth promoter. The addition of Oleobiotec to the feed of broiler chickens significantly improves growth rate and slaughter weight when compared to control feed.

Performance in turkeys

The results obtained in turkeys are similar to that of broiler chickens. Tables 5 and 6 summarise the trial conditions and results for two experiments conducted in turkeys. Fig. 3 shows that Oleobiotec sig-

nificantly increases turkeys live weight at 12 and 20 weeks, as com-

• A significant increase of alpha-glucosidase enzymatic activity in the ileum (Table 7). As observed with broiler chickens, Oleobiotec efficiency in improving performance and survival in turkeys is similar to that of antibiotic growth promoters.

It can be concluded from the results of these various trials that the natural feed additive Oleobiotec, which combines the anti-bacterial properties of essential oils to the digestive qualities of certain spices, enables the enhancement of growth performance in turkeys and broiler chickens (ADWG and live weight at slaughter).

It also improves feed efficiency, resulting in optimal feed valorisation.

Various trials have permitted us to measure these effects against those of antibiotic growth promoters.

Over the past few years, the European poultry production market has evolved, driven by various constraints, both economical and regulatory (AGP withdrawal, salmonella regulations), whilst also having to meet consumer expectations.

In such a context, Oleobiotec appears to be a profitable and sustainable alternative that naturally optimises poultry performance.