

# What are the alternatives to antibiotic growth promoters?

Fifty years ago, antibiotic growth promoters were starting to be used in livestock farming. They were used to improve production while limiting costs. As antibiotics are special drugs due to the diversity of their targets and their ability to develop resistance, their frequent use in livestock farming has led to the emergence of resistant bacteria that cause certain treatment regimens to fail. In 2006, the European Community banned them as growth promoters, so from then on they could only be distributed by veterinarians for therapeutic treatment.

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In 2018, the World Health Organization stated in a report that antibiotic resistance is one of the biggest threats to global health, food safety and development, despite the measures already in place.

The emergence of resistant strains that are not sensitive to antibiotics is still a challenge in the agricultural sector today. Banning antibiotic growth promoters is not a 'sustainable' solution and requires monitoring of nutritional strategies and interventions as well as measures to prevent and control disease.

## Manufacturers monitoring the propagation of resistance as closely as possible

Using pharmacological, epidemiological and clinical data, committees of experts work to establish thresholds for concentrations, beyond which antibiotics are no longer effective against a given bacterium.

In France, this is the AntibioGram Committee of the French Society of Microbiology. A bacterial species is considered to be sensitive (to a given antibiotic) if the Minimum Inhibitory Concentrations (MICs) of the majority of strains are less than or equal to the average concentrations reached by the antibiotic during the treatment.

Plans for monitoring the emergence of resistance on an annual basis are drawn up

by the Food Directorate in collaboration with laboratories.

Samples of tissue and faeces from healthy animals are organised with slaughterhouses and MICs of 'sentinel' bacteria are determined using a sample group of antibiotics. The data have been collected and analysed on the European level by the EFSA (European Food Safety Authority) since 2001.

## Data collected and analysed on the European level

Using the data collected by EU Members, EFSA produces annual summary reports in collaboration with the European Centre for Disease Prevention and Control (ECDC) and the European Medicines Agency (EMA). They gather information on antibiotic resistance but also zoonoses and outbreaks of foodborne diseases. These reports then give a picture of how the situation is developing on the European level.

In addition, in 2017, the European Commission launched the 'One Health, une seule santé' Action Plan, recognising that human health is closely linked to the health of animals and the environment.

The programme is a collaboration between 39 partners including government experts in human and animal health, EU scientific agencies (ECDC, EMA and EFSA) and Commission experts from 19 European countries.

This programme is based on three objectives:

- Making the European Union an example of 'good practice'.
- Stimulate research, development and innovation by finding new solutions to prevent infectious diseases and control the spread of antimicrobial resistance (AMR).
- Intensify EU efforts worldwide to provide guidance on AMR and associated risks in an increasingly interconnected world.

## And on an international level?

On an international level, countries have been working together since 2006 through an intergovernmental task force on Antimicrobial Resistance (AMR) in the Codex

Alimentarius. The Codex Alimentarius is a special programme from the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO).

It consists of collecting standards, codes of practice and recommendations and it aims to guarantee and improve food safety in the food processing industry, consumer safety and environmental protection.

The purpose of the Intergovernmental Panel on AMR is to provide scientific advice on how to assess and manage human health risks associated with the presence of antimicrobial-resistant micro-organisms in food products.

In addition, the European Union and the United States consult on issues of antimicrobial resistance through a Transatlantic Action Group.

## How natural solutions can help to reduce resistance

Faced with the spread of resistance and the ban on the use of antibiotics as growth promoters, it is essential to consider alternative solutions.

In order to meet this demand, many additives have been shown to be beneficial in maintaining health in animals. Among them, plant extracts have proven themselves to be beneficial in attempts to replace these molecules, not by aiming to destroy pathogens but by helping animals to better overcome their presence.

Numerous publications demonstrate the ability of certain extracts to reduce inflammation caused by the pathogen (for example capsaicinoids from capsicum oleoresin found in red peppers) or to potentiate the response of the acquired immune system (for example curcuminoids, which are present in turmeric root extracts).

## Preparing a combination of finely selected plant extracts

Pancosma, an internationally renowned Swiss company, was a pioneer in the development of additives based on plant extracts among others.

*Continued on page 26*

Continued from page 25

In 2015, Pancosma launched on the market the first zootechnical feed additive based on standardised and finely formulated plant extracts: Xtract Evolution-B.

Its positive effects on efficiency for feeding and weight gain in broilers were then officially recognised by the EFSA committee.

### A new generation of additives to complement precision feeding

Further studies have shown that this additive (Xtract Evolution-B) based on a selected mixture of phytomolecules made up of carvacrol (naturally occurring in oregano), cinnamaldehyde (naturally occurring in cinnamon) and capsicum oleoresin (from red pepper) has the potential to provide an alternative solution to using antibiotic growth promoters.

According to data collected over 20 years from field trials, including this additive in poultry diets would allow chickens to achieve similar levels of growth and performance as those with diets supplemented with an antibiotic growth promoter (avilamycin, bacitracin, flavophospholipol or enramycin).

An overview of the effects of this mixture is presented as a meta-analysis (see Table 1), involving 38 trials on broilers and comparing

	Negative control	Antibiotic growth promoters	Xtract 6930	P-value
Feed intake (g/d)	81.99	84.04	84.09	0.40
Average daily gain (g/d)	48.9 <sup>b</sup>	50.4 <sup>a</sup>	51.3 <sup>a</sup>	0.001
FCR (g/g)	1.73 <sup>a</sup>	1.71 <sup>ab</sup>	1.68 <sup>b</sup>	0.01

Table 1. Summary of the meta-analysis of 38 trials on broilers.

negative controls or poultry feed supplemented with antibiotic growth promoters with the natural solution.

### Conclusion

Antibiotic growth promoters have long been considered to be the most effective solution for minimising production costs. However, their harmful effects on the development of antibiotic-resistant strains of bacteria have strong implications in the field of health and are a cause of concern for health and consumer authorities.

The experience in Europe has shown that merely banning antibiotic growth promoters is not enough to restrict their use in industry.

General and multidisciplinary measures are

needed in order to provide a comprehensive solution.

Given the total ban on antibiotic growth promoters in Europe, using zootechnical additives like Pancosma's Xtract Evolution-B to provide an alternative by promoting growth as well as improving feed conversion rates, remains a viable and promising economic alternative.

In light of a suggestion of stricter regulations or an almost total ban on antibiotic growth promoters in other parts of the world, the results of these studies on bioactives are even more interesting when applied as an alternative. ■

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References are available  
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