

Science & Solutions

Antibiotics Reduction in Modern Broilers



Luca Vandi



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A 360-degree approach is the way forward in using antibiotics responsibly and maintaining high performing flocks. Highlights from the first ABF Days at BIOMIN world headquarters, where experts shared their views with delegates from 23 countries.

There's growing demand for antibiotic reduction on the market," observed Luca Vandi, Technical and Regional Marketing Officer EMEA at BIOMIN. "It stems from a combination bottom-up pressure coming from consumers and top-down influence of laws and legislation."

Resistance matters

Antibiotic reduction is not about antibiotic residues potentially finding their way into meat, milk and eggs: withdrawal periods and monitoring ensure that antibiotics do not enter the food supply. Rather, it relates to growing concerns around bacteria that are resistant to one or more drugs (single or multi-resistant), along with the potential impacts on human and animal health.

The phenomenon is not new. "Antimicrobial resistance (AMR) is an issue that was recognized in the 1950s," stated Ellen van Eerden, researcher at Schothorst Feed Research. The existence of antimicrobial resistant bacteria stretches back much further. "Resistance is as old as bacteria

themselves," noted Nataliya Roth, scientist at BIOMIN. Gut bacteria found within 1000-year-old mummies from the Inca Empire have been shown to be resistant to antibiotics. While a certain level of resistance is innate, or natural, application of antibiotics puts selective pressure on resistance genes in bacterial populations. It is the latter that deserves attention in the field.

"Even if the transmission of antibiotic-resistant genes from animal production to humans remains controversial, it's a reality that in animal production, more and more multi-drug-resistant (MDR) pathogens can be found in the field," observed Mr Vandi. Consequently, resistance is a key driver in the push to reduce antibiotic in livestock.

Preserving medicinal value

An important element of the discussion about antibiotic reduction involves setting realistic expectations and properly framing the role of antibiotics in the industry.

"At BIOMIN, we believe in the prudent use of antibiotics, which means preserving the medicinal value of antimicrobials



Luca Vandi



Ellen van Eerden

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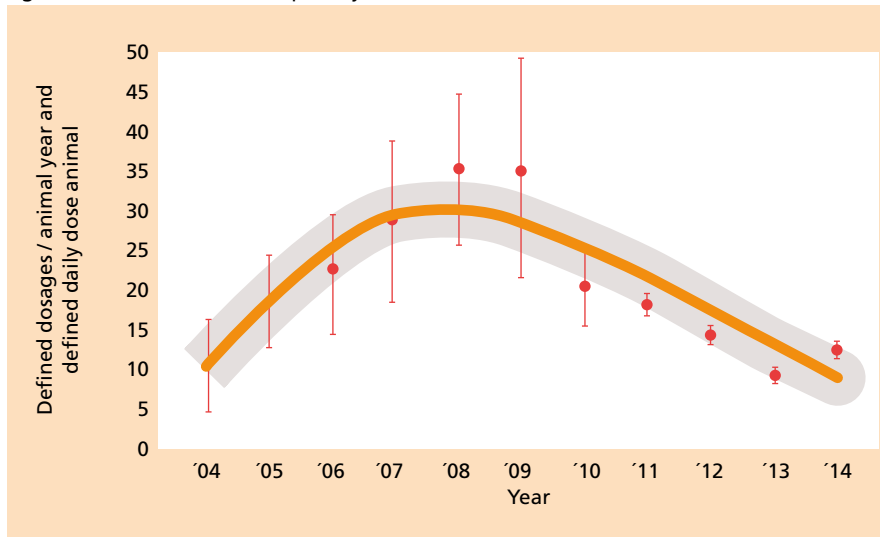


Nataliya Roth



Franz Waxenecker

Figure 1. Use of antibiotics in poultry in the Netherlands.



Source: Maran, 2015

for treatment of disease,” stated Franz Waxenecker, Development Director at BIOMIN.

Responsible or prudent use does not mean the complete elimination of antimicrobials in all circumstances, but rather their application in situations deemed relevant and necessary. “There will never be zero antibiotics,” commented Mr Waxenecker.

Solving the puzzle

“Reducing antibiotics requires a 360-degree strategy that involves many different and closely connected aspects of broiler production, including genetics, nutrition, biosecurity and management,” noted Mr Vandi. As the role of antibiotics is restricted to disease prevention, these aspects fill the role of disease prevention and growth promotion.

“In modern production, we need growth promoters in feed,” remarked Mr Waxenecker. “The challenge in antibiotic exit programs is to reduce antibiotics while keeping performance high,” he added. The successful implementation antibiotic-free (ABF) feeding programs has been documented in many cases, and could be instructive to those looking to make the shift.

“The ABF puzzle can be solved,” said Ms van Eerden, citing the example of The Netherlands, where antibiotics use in broilers fell considerably (Figure 1), while performance parameters continued to improve. The feed conversion ratio (FCR) fell from 1.75 in 2010 to 1.61 in 2015, while average daily gain (ADG) rose.

One delegate pointed out that although antibiotic reduction involves multiple moving parts, management

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Figure 2. Optimum condition of the air inside a poultry house.

Oxygen	>19.6%
Carbon dioxide	<0.3% (<3000 ppm)
Carbon monoxide	<10 ppm
Ammonia	<10 ppm
Relative humidity (%RH)	45-65%
Dust	<3.4 mg/m ³

Source: BIOMIN

practice remains crucial, stating ‘if you don’t have good management practices to start, the rest is almost a waste of time.’

Management

In most modern broiler operations, the genetics are largely the same –regardless of country– and birds have similar growth potentials. Management practices and environmental factors can make the difference. Epigenetics, the study of how internal and external environments change the expression of genes, may explain variation among birds with the same genetics. These differences can influence birds’ health and performance—and consequently a producer’s economic result.

“Environmental factors in your poultry houses –e.g. temperature, ventilation, light, etc.— are not free. They cost you money. But they will cost you more money if they are not looked after properly,” cautioned Mark Karimi, Technical Sales Manager at BIOMIN.

He offered a number of tips regarding poultry house temperature:

- Temperature tables are mere guidelines. Make sure you understand the environmental conditions before using them.
- Chicks exposed to low temperatures have a quite different behavior pattern compared to those at normal temperature.
- Chicks’ gastrointestinal tracts develop best when their internal temperature reaches 42°C.
- Elevated brooding temperature may improve birds’ welfare without affecting final body weight or uniformity.

Regarding ventilation, the optimal condition of indoor air for a poultry are well documented and can be found in numerous textbooks (*Figure 2*). “If you want the best health and performance from your birds, you have to get to these numbers,” stated Mr Karimi, adding “There is no compromise. It costs you money...and it’s not easy. It takes time and practice to master.”

Birds are highly sensitive to changes to air quality parameters, and because the negative effects of dust, ammonia and CO₂ in early stages have repercussions later on, these factors are best addressed early in the production cycle.

Nutrition

Nutrition typically accounts for 60-70% of broiler production costs, and can affect birds’ gut performance. Ellen van Eerden, researcher at Schothorst Feed Research, offered a number of nutrition tips. First, use sufficiently coarse particles. Second, reduce viscosity of the diet. “Viscosity is a risk factor for intestinal health,” according to Ms van Eerden.

Third, use a balanced amino acid concept, and use highly digestible protein. “Protein quality becomes more important when antibiotics are removed,” stated Ms van Eerden. Fourth, reduce protein as substrate for fermentation. “5-phase feeding reduces, but does not remove, excess protein from the diet,” she added.

Biosecurity

“Biosecurity is often overlooked as an area for investment,” observed Zeno Bernardi of Unitec. “Yet, biosecurity and animal welfare are a major requirement for end consumers—and therefore important to retailers and supermarket chains. It’s an opportunity to add value to the company.”

He emphasized practical biosecurity and hygiene measures, including a 7-step empty house protocol, the greater importance of flow rate over water pressure of washers/sprayers, and highlighted the care and attention that are required for best results. “Details matter,” he said. “Be thorough.”



Mark Karimi



Zeno Bernardi