Frankfurt, 27-29 September 2017
Conference report
From tackling antimicrobial resistance issues to the latest research about how animals eat, more than 450 delegates at the inaugural Feed Additives 2017 conference had plenty to think about.

An intensive discussion and networking event for the speciality feed ingredients sector hosted by Feedinfo News Service, the three-day conference in Frankfurt attracted top-quality speakers and delegates from across the world.

Feedinfo News Service captured the action as it unfolded, with this summary document highlighting some of the key discussions. With more than 70 leading speakers from across the industry, visit www.feedinfo.com to see much more in-depth coverage from the event.

**Day 1: 27 September 2017**
Sponsored by Kemin

“By 2050, an expanded global population, predicted to reach 9 billion, will consume two thirds more animal protein than it does today. This growing demand for protein provides opportunities for the feed additives industry. Feed Additives 2017 started off with an overview of recent market insights and strategies for multiple product groups essential in today’s animal diets.

“Following the sold out opening day of Feed Additives 2017, all delegates were welcomed aboard a river cruise boat party. On this boat tour, next to enjoying Frankfurt and its surroundings from a new perspective, there was plenty of opportunity to network with industry colleagues.”

**To Pursue Reductions in Global Antibiotics Use, Data and Collaboration Key**
The drive to decrease antibiotic use is on the minds of industry stakeholders at every level, not only those in the nutrition, but also animal health professionals, genetics experts, and of course regulators and those responsible for public health.

And as Stuart Court, Technical Manager at Novus, pointed out, that centre of interest has expanded even wider; whereas antibiotics reduction was traditionally the domain of regulators, he explains, the movement is “now driven by consumers”.

Paolo Doncecchi, Global Business Manager of Adisseo, added that this is raising new questions, notably about the use of substances like ionophores, and even about the use of antibiotics in a strictly therapeutic sense to treat bacterial diseases, that the industry must be prepared to respond to.

However, there is a wide variety of solutions available to address this. On the nutrition side, enzymes, organic acids, and other digestive enhancements were cited, as well as probiotics and even herbal solutions. But Martin Rijnen, Global Director, Nutrition of De Heus, said these goals cannot be easily achieved without recourse to farm management solutions affecting every aspect of an animal’s life. Attention to detail helped European producers stabilise or increase production at the same time as they reduced antibiotics consumption, said Doncecchi, adding that in Denmark, producers “now have 32-33 piglets per sow per year”.

Antibiotic use data is not so well developed, at least on a global level. The World Organisation for Animal Health (OIE) is attempting to address this deficit with a multi-phase survey of member states on their use of antibiotics in animals. Delfy
Gochez, chargée de mission for the OIE said the project is riddled with challenges, including figures that are changed after reporting as the countries refine their datasets, plus lack of knowledge about the total biomass of species in some countries which makes per-animal comparisons difficult. She said that as data from countries responding is supposed to be anonymous, the project will not in the near future provide data on the use of antibiotics in each individual country. However, it encourages participants to make their data public on a voluntary basis, and links to those in the back of its reports.

The panel agreed that all stakeholders could collaborate and work towards understanding and adoption of the multiple solutions that have already been identified, focusing on cheap and effective ways to prevent disease. As it pointed out, there remains much white space when it comes to working with veterinarians and ensuring that incentives are correctly aligned to reduce antibiotics use; additionally, the feed sector could be better in tune with genetics providers to ensure that both nutrition and genetics were optimised to promote animals’ immune health.

There must also be a continuation of efforts on the data collection front. Gochez revealed that countries appear to be increasingly interested in participating in the antibiotics use survey, as several materialised after phase one to inquire about contributing. It is especially important to continue providing advice to countries lacking expertise in these matters, she said. “Member countries need support. Most agencies are doing this for the first time.”

Areas of growth in the specialty feed industry

Panel discussion featuring Hannes Binder, Managing Director of Biomin; Markus Dedl, Chief Executive Officer of Delacon; and Aart Mateboer, Business Unit Director of DuPont.

Technological advances and improved conversion rates will be the leading factors that will shape the specialty feed industry in the medium to long term, according to panel members.

Hannes Binder said: “There is nothing very new on the horizon in terms of new products, instead we expect to work ahead to improve performance of livestock.” He added that points of discussion in the future will be antibiotic alternatives, sustainability and the need to improve feed conversion rates.

“The technology needs to improve to support gut health in animals and also more acid based products are needed.” The panel speakers agreed that the presence of mycotoxins will also be a major challenge which the industry will need to tackle.

In terms of sustainability, Markus Dedl from Delacon said that it is a major objective and needs to be a top priority for the industry. “With more population we will need to produce more food and thus grow more animals, this will all require more resources.”

He added: “The industry needs to take responsibility for this as we are the first link in the food chain.” Dedl went on to say that the industry’s environmental impact is a major factor and it needs to be reduced to make the sector more sustainable.

Aart Mateboer said that the role of phytase will continue to be important even though its penetration is already at around 90%. “Farmers will apply higher dosage and this will increase phytase consumption – I think this will be the driver of the phytase industry in the next few years.”

The speakers agreed that working with start-ups in the industry is important as often they are the drivers of innovation. Mateboer said: “We are always delighted to support start-up, whether it is financial assistance or helping them get closer to the market. We can also assist with trials.”
He added: “We need to develop technologies to use data and to apply this to our understanding of what goes on in the gut of the animals.”

Discussing potential threats, Mateboer remarked that commoditisation can be considered a threat as developing a new product costs a lot of money and companies selling lower quality products at rock bottom prices can disincentivise further research.

According to Dedl, the regulatory environment can be a threat too, as they need to create sensible legislation with a measured approach.

Responding to questions about whether price considerations can put buyers off using speciality products, Binder said that the animal’s health should be top priority and this should always be more important than the price of the product. He said: “Using high quality products is like taking out an insurance – it helps you maintain gut health and keep the livestock healthy as well.”

Mateboer said: “Using enzymes improves feed conversion rates so it is clearly better for our customers.”

Another question from the audience concerned lab-grown meat. Dedl said that its importance is not very high at the moment but maybe in decades it could play a role so it is good to keep it on the radar. On the other hand, Mateboer said that at the moment there is certainly no need to worry about competition from this sector.

**Day 2: 28 September 2017**

**Sponsored by DuPont**

“Feed Additives 2017 provided a great opportunity for keeping up to date with the latest industry trends, meeting with industry peers and business partners, and for networking.

“The morning session of day 2 was dedicated to product innovation opportunities. The speakers discussed global meat consumption trends and their impact on the market for feed additives. The sessions also covered holistic approaches to solving the huge challenge in antimicrobial resistance, which could become the most common cause of death in the future.

“The afternoon was dedicated to policy and regulation, with a focus on the regulatory challenges in approving feed additives in both the EU and China. There is no doubt that feed additive approval is a complex, lengthy and costly process. A number of improvements are possible in the forthcoming revision of the Feed Additive Regulation in the EU.”

**Mastering the Mode of Action Is Key to Consistent Effects of Gut Health Products**

The gut is an area of animal physiology which is stunningly complex, and in the face of this complexity, our understanding of all of the interactions is still unfolding. However, the importance of the gut in preserving the overall health status is undeniable. Any attempt to improve yields, to reduce antibiotics use, and to cut costs by improving outcomes on the farm will all involve a profound understanding of the gut.
Tasked with presenting innovations in gut health to the Feed Additives 2017 audience, Leo den Hartog, Director of Research and Development at Trouw Nutrition, talked about the different ways feed additives producers could prevent pathogen intake, manage the microbiota, and improve gut integrity. A few of the many takeaways:

- While the paradigm of eubacteria—good bacteria—was a transformative one (unseating the idea that bacteria were always a negative force to be suppressed), den Hartog cautioned that the question of good gut bacteria vs. bad gut bacteria is missing part of the story. Of course, there are individual strains that are clearly pathological and others that are known to be beneficial, but attempts at categorization will necessarily miss important subtleties—lactobacillus, generally thought of as a positive microorganism, still includes some malicious strains. However, one thing that appears to be categorically problematic is low bacterial diversity in the gut.

- “Animals don’t lie,” den Hartog said. More precisely, animal performance is the ultimate measure of your gut health product’s effect, and if it does not materialise, you have an obvious problem, no matter how solid the theory. However, if you understand the physiological and chemical transformations a product unchains, step by step, you can figure out how to translate a single breakthrough to geographic markets where animals have distinctly different microbiomes and are kept in unique and varied conditions, den Hartog explained.

- “You can’t say you ‘have an alternative to antibiotics.’ There is no alternative to antibiotics. But you can say you have a product that ‘supports animal health.’” In markets such as Germany and the Netherlands, providers have more than halved the use of antibiotics while improving feed conversion and digestibility ratios using such solutions. And the idea of manipulating the gut microbiota clearly holds untapped promise; den Hartog explained that experiments with lab rodents had suggested the ability for inter-species transplants of gut flora to influence behaviours, a concept with obvious applications for both animal and human nutrition.

**Feed Businesses Must Embrace Digital Age or Die, Warns Alltech’s Aidan Connolly**

In a changing world where consumers are making changes such as no longer aspiring to own a car, shop in malls or work in factories or on farms, businesses are having to change radically and those who are digital-savvy will stand the best chance of survival.

In a changing landscape, feed businesses are having to consider issues such as safety, transparency, sustainability, government regulation and the rise of ‘prosumers’ who want to know much more about their food, Alltech’s chief innovation officer, Aidan Connolly told the Feed Additives 2017 conference.

He believed digital technology would play a critical role in addressing all of those concerns, whether it was using blockchain to ensure traceability of ingredients and to help maintain data confidentiality, or using sensors and robots to work on farm and in factories to overcome labour shortages and to maintain accuracy in processes such as feed manufacturing.

Artificial intelligence, which can mimic human cognitive behaviour, would help eliminate misconceptions, and could replace advisory professions such as vets and nutritionists on-farm in future, he said.

Virtual reality technology is already in use in vet schools, helping to teach students how to calve cows, for instance, without requiring a ‘live animal’ to practice on, he said. Augmented reality could help people spot disease issues before they become apparent to the human eye.

Some agricultural businesses were already taking advantage of digital progress, he said, citing a Californian dairy farm which had installed cameras which tracked the is movements of individual cows to see whether they were eating and drinking enough.
"With 100-400 cows in a barn, there’s no way one person can individually monitor each cow. The only other data point they have is twice a day milking.

“Really, we are still using the same systems as 10,000 years ago, but managing with a remarkably small amount of information. We are selling products, but based on what?”

Agriculture is changing now, he said, and he believed those changes should be keeping people awake at night. “You need to embrace it.”

**Industry and Governments Must Work Together to Fight Antimicrobial Resistance**

Panel discussion featuring Ruud Tijssens, Director Corporate Affairs, Strategic R&D and CSR, Agrifirm Group; Bruno Kaesler, CEO, Kaesler Nutrition; and Daniela Battaglia, FAO Working Group on Antimicrobial Resistance.

It is important to look at all sources that could present antimicrobial resistance problems and pursue efforts to adopt a One Health approach as advocated by the World Health Organization.

Food animals are a priority but pets, humans and plants need to be considered too, said the panel members on specialty feed ingredients and antibiotic use reduction.

It was pointed out that feed additives are not the only solution to fight antimicrobial resistance, as further efforts on farm management are needed. But better farm conditions will lead to better optimisation of feed additive usage.

“Animal nutrition is one of the key building blocks,” argued Ruud Tijssens.

The panelists all agreed that communication in the whole chain is paramount and that the regulatory framework and spreading a coordinated message in the right way to the farmer are of equal importance.

“We need validated research models that predict the effect of increased resistance of the animal. And then find out how to communicate results to marketing and sales teams,” Tijssens said.

Daniela Battaglia stressed that there is need to also develop the proper legislation and for discussions between the feed additive industry and governments.

“I invite the sector to be very active at the Codex Alimentarius sessions and share their research, so that those in charge can address it,” she said.

It will also be crucial to change mindsets.

“I don’t agree that antibiotics are cheap,” Battaglia said when answering a question from the audience. “I’d say the cost of antimicrobial resistance is high as it impacts human health and in animal production in the long term.”

“In that respect antibiotics are not cheap anymore,” she added.

**The Regulatory Landscape of Specialty Feed Ingredients in Europe**

A shorter time frame for approving new feed additives – and at less cost – should be a priority, delegates at Feed Additives 2017 were told.
Bernadette Okeke, Board Member for the EU Association of Speciality Feed Ingredients and their Mixtures (FEFANA), examined the procedures European manufacturers and agents go through when registering specialty feed ingredients at the conference in Frankfurt.

Okeke also looked at EFSA’s role in the regulation processes and the new guidance published by the various organisations overseeing these processes.

She said: “The feed industry’s and our priority is to educate government departments and liaise with them to create transparent, fair and balanced systems for authorisation.”

Feed producers need to meet various criteria during the application and approval process and some members of the industry feel that these criteria could be simplified.

Okeke said: “At the moment in my opinion the biggest barrier to progress is the regulatory minefield – if a product doesn’t fall within a very specific functional group that is a problem.”

The process from application to approval can take at least 30 months at present, which is viewed as an unnecessarily long time frame.

The high cost of approval is often a burden, as it can be as high as EUR2-10 million.

“One of our main priorities need to be to simplify the process and shorten the time frame to be more competitive – I believe in the US the process is very different and often faster,” Okeke said.

Day 3: 29 September 2017
Sponsored by Kaesler Nutrition

“The final day of Feed Additives 2017 saw the conference split into three streams, giving attendees the option of choosing between speakers covering Enzymes, Minerals or Eubiotic & Phytogenic feed additives.

“Across all three workshops, the audience interaction was impressive, with over a third of attendees participating in interactive discussions and asking questions to a diverse line-up of academics and industry professionals.

“All the workshops highlighted progress made by the industry in recent years, particularly in enzymes, as speakers discussed how the new generation of products is beneficial not just to animal health and production, but to the environment too, enhancing the sustainability of our industry.”

Today’s Mineral Nutrition Challenges
Mineral nutrition in animals today is evolving faster than ever as companies in the segment continue to discover new applications and offer products with greater mineral bioavailability.

During an interactive mineral nutrition session chaired by Grit Monse (Secretary General, European Manufacturers of Feed Minerals Association), panelists Alex Yiannikouris (Research Group Director, Chemistry Division, Alltech), Scott Hine (Vice President of Products and Solutions, and Chief Innovation Officer, Novus International), Philip Maynard (Product Manager, Micronutrients USA) and Terry Ward (Global Director, Research & Nutritional Services, Zinpro Corporation) all agreed that
they are seeing new results and potential on how minerals are improving animal performance and how their use may reduce
the environmental impact of animal production.

They agreed that zinc is perhaps the most common mineral used due to its multiple activities, but others show promise such
as selenium, as well as the less often mentioned chromium and iodine.

It is estimated however that about 30% of raw materials used in the manufacture of feed minerals are rejected due to
impurities.

The panelists, however, believe that this goes to show that the testing systems in place are efficient. Nevertheless they all
agreed that working with raw material suppliers is crucial to offset this issue, and efforts have to be pursued to help these
suppliers understand the important role they play in terms of animal and by extension human health.

Another challenge identified was the June 2017 ban on zinc oxide by the EU authorities. The panelists pointed out though
that there are solutions available in the market with similar benefits to zinc oxide and which show high anti-viral promise.
Chelated zinc could be one of these solutions.

The mineral nutrition sector is not only working with universities to carry out more research, but there is also a clear interest
in working with genetics companies and vaccine manufacturers to further understand the synergistic effects minerals can
have with other complimentary technologies.

“It is important to take into account the full holistic effects,” Scott Hine commented when discussing minerals in the broader
context.

**Advancements in the Field of Feed Enzymes and Challenges Ahead**

*Panel discussion featuring Pierre-André Geraert, Director, Innovation Marketing, Adisseo; Peter Ader, Senior Expert Animal
Nutrition, BASF; Milan Hruby, Global Applications Senior Manager, DuPont and Vibe Glitsø, Director, Novozymes.*

Panel members at Feed Additives 2017 discussed developments in the field of enzymes as specialty feed ingredients during
an enzymes workshop on the third day of the event.

The panelists reviewed the challenges to be overcome through developing and using enzymes in animal feed and the future
of enzyme research in the feed additives sector.

Pierre-André Geraert said: “Most NSP degrading enzymes were identified years ago and we need to do more to further
understand them and to develop more techniques to better benefit from them.”

He added: “We need to value the full potential of the enzymes and try to understand the full digestibility potential to
improve the efficiency of the animal.”

BASF’s Peter Ader said that the industry has advanced hugely on the technological front in the past few years but there is still
room for improvement. “Today we can use dry formulations with better thermo-stability which can withstand pelleting at
temperatures of 90-95 degrees C. This wasn’t possible in the past, for example 10-15 years ago.”

Ader added that now the challenge is to further improve the qualities of the product and to achieve more in terms of an
enzyme’s ability of phosphate breakdown.

Milan Hruby, who has been in the animal nutrition industry for 20 years, said that the sector has come a long way in the past
two decades and the future seems very promising. “The focus will be on the gastro intestinal tract, beneficial microflora, change in pH and immune response. We need to understand more about what is happening in the gut.”

In Vibe Glitsø’s opinion, the benefits of enzymes are clear, not only on animal health but also on the environment.

She said that if you can feed more animals and therefore more people using the same or fewer resources thanks to enzymes that can only be viewed as a positive.

During the interactive Q&A session, the panel discussed how to maximize an enzyme’s impact on animals.

Joining the discussion from the floor, Leon Marchal, Director, Nutrition and Innovation at ForFarmers said that the industry needed to become more transparent and provide matrices that display test results in the worst, best and average scenarios and not only in the optimum case. “This will help people understand the product more and also to trust the industry.”

In response, Geraert said that the customer and supplier need to go together step-by-step to discover the full value of the product and to get the best result.

Glitsø added that the industry needs to have a better understanding about the relationship between feed and enzymes and how to get the best result from utilising them.

Hruby believed customers need to push back and request more data, and to tailor the product to their requirements whether they are using barley, corn or wheat and to ensure their specific production processes suit the enzymes in question.

Hruby said: “If there is potential to save EUR6-7 per tonne of feed by using enzymes, it is such a benefit that there should be more dialogue between customer and seller.”

In the audience, Richard Cooper from AB Vista said that buyers now use more enzymes and are willing to apply higher doses “so I think the industry is going in the right direction”.

Paul Iji, Professor of Animal Science at the University of New England, sitting in the audience, said that feed mills should share their findings with not only their suppliers but also with other enzyme industry professionals to compare the results and improve quality jointly.

Ultimately, most attendees agreed that the cost savings involved with using enzymes will pay for the investment and most likely offset the potential additional costs at the beginning of the process.

**Immuno-cooperation and Strain Specificity Among the Many Avenues for Fruitful Probiotics Research**

The gut microbiome, is a key component of the body, and its diverse functions or malfunctions affect everything from the immune system and vaccine responses to muscle myopathies, auto-immune and metabolic disorders, and even cancer.

Thanks to increased attention by the industry, as well as to new tools such as genome sequencing, our understanding of the ways in which this powerful ecosystem can be harnessed to improve outcomes for animals has expanded in many directions, according to Dr Leon Broom, Senior Manager of the Gut Health Consultancy and Visiting Research Fellow at the University of Leeds.

In a session summarising the state of probiotics research, Dr Broom said it was clear that the probiotics field will remain a fruitful one for researchers for years to come.

“We are still not entirely sure what an optimal gut microbiome should look like,” Dr. Broom said. This is a function of the fact
that many of the microbial actors in the gut are still not well identified or characterised, an unsurprising fact given the sheer number of organisms in question. In addition, the bacteria, viruses, fungi, and bacteriophages form an ecosystem unique to each individual animal; members of the same flock or herd, receiving the same food and exposed to the same environmental factors will still develop a unique microbiological profile.

One particularly interesting research avenue is that of immuno-cooperation, working with the animal’s own defence system to promote gut health. Dr. Broom acknowledges that, while the inflammation response demands high levels of nutrients from animals, a pro-inflammatory approach in pigs and poultry made the animals more robust against pathogens. He also talked about the lessons learned with AGPs; even at low levels, sub-MIC (minimum inhibitory concentration), antimicrobials often delayed growth of pathogens long enough to allow the immune system to activate itself against the threat.

But, he added, “it’s one thing to know what you want to target, which is already difficult to understand. It’s another to know where you want to target”. From this comes the importance of encapsulation, allowing eubiotics to target different portions of the digestive system, with differing pH levels and floral colonies.

Meanwhile, current and future developments underline the importance of strain specificity. Even within an individual species of microorganism, you will see different effects if different strains are used, he said. Cumulating effects by creating synbiotic combinations is also an area rich in potential, particularly to render probiotics more cost-effective. The stage is set for an explosion of new probiotics revelations, he said.
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