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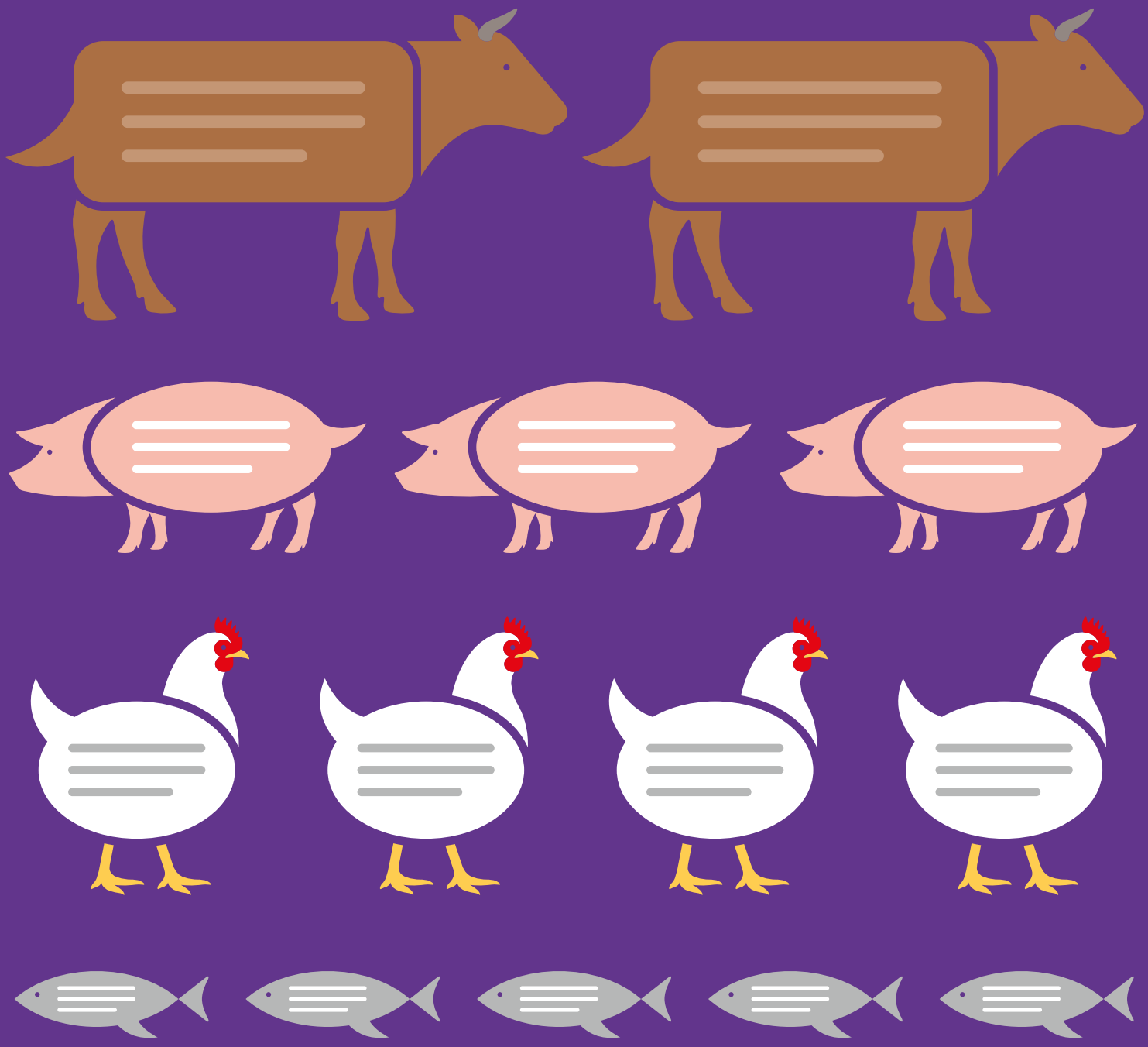
SCIENCE & SOLUTIONS

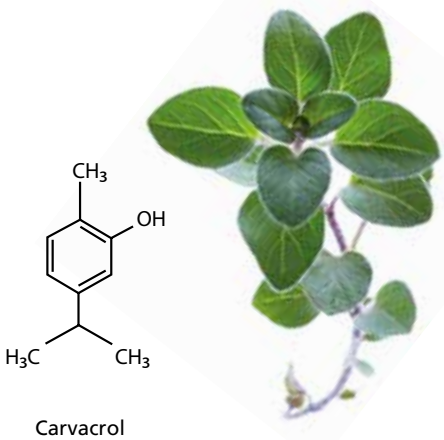
Analysis of the 2018 survey results

What dozens of poultry trials tell us about phytogenics and profitability

Keeping you naturally informed | Special issue | Phytogenics



Phytogenic feed additives survey 2018



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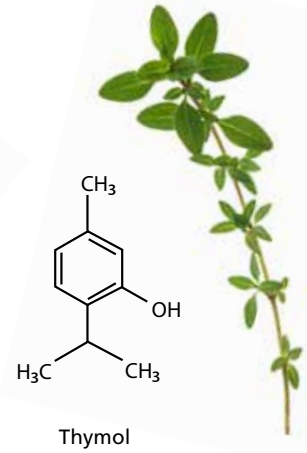

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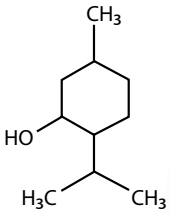

Menthol

4

2018 BIOMIN Phytogenic Feed Additives Survey

The views of more than seven hundred agribusiness professionals on the use of phytogenic feed additives (PFAs) reveal a number of interesting insights regarding motivations for using PFAs.

9

What Dozens of Poultry Trials Tell Us About Phytogenics and Profitability

Michael Noonan MBA
Global Product Line Manager Phytogenics

Performance and meat quality improvements stemming from phytogenic feed additive application are key to better economic results.

Phytogenic use set to flourish

Phytogenic feed additives (PFAs) are a relatively new addition to the animal feed market. Bringing such novelty to the market takes years of research and development. BIOMIN has been committed to the improvement of phytogenic products for the past thirty years, and that commitment continues every day. Research and development is ongoing to ensure the Digestarom® product line is the best it can possibly be.

What really matters is how a feed additive performs in the field. BIOMIN recently conducted the second Phytogenic Feed Additives Survey, which gathered responses from feed industry professionals around the world on PFA use and experiences. The most notable result was that 60% of respondents reported an intention to increase their use of PFAs in the coming 12 months. Not only does this reinforce the importance of PFAs in the animal feed industry, but it also shows how much more awareness there is about the range of benefits PFA inclusion can deliver.

Phytogenic products are plant-based compounds with a range of biological properties that deliver a number of advantages in the animal. The top two reasons for PFA use as reported by survey respondents were their ability to enhance the digestibility of feed, and their antimicrobial effects. In addition, PFAs were also cited as an important part of a strategy to reduce the amount of antibiotics used in feed. We expect this to be of particular interest to those in certain regions of the world where antibiotic use for growth promotion will be prohibited.

In this special issue of Science & Solutions magazine, as well as sharing the results of the 2018 PFA Survey, we also highlight some results from recent field trials with Digestarom® in poultry diets. The trials show a number of benefits when Digestarom® is added to the diet, including improvements in FCR, body weight gain, productivity index and laying rate. Similar success has been documented in the numerous trials with Digestarom® in swine, ruminant and aquatic farmed species.

BIOMIN is committed to continually improving the Digestarom® product line to fully address customer needs. Sharing the information we have gathered in order to make that happen will keep you naturally ahead.

Finally, we would like to thank everyone who took part in the survey, and we wish our customers around the world continued success.

Keeping you naturally informed.

Your BIOMIN Phytogenics Team

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magazine@biomin.net

Editors: Ryan Hines, Caroline Noonan
Contributors: Michael Noonan MBA, Christine Hunger Dr.sc.agr., Carina Schieder DI (MSc), Thomas Weiland Dr.agr.Ing., Mathias Zaunschrim MSc., Plinio Barbarino DSc.
Marketing: Herbert Kneissl, Karin Nährer
Graphics: GraphX ERBER AG
Research: Franz Waxenecker, Ursula Hofstetter
Publisher: BIOMIN Holding GmbH
Erber Campus, 3131 Getzersdorf, Austria
Tel: +43 2782 8030, www.biomin.net

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2018 BIOMIN Phytogenic Feed Additives Survey

The views of more than seven hundred agribusiness professionals on the use of phytogenic feed additives (PFAs) reveal a number of interesting insights regarding motivations for using PFAs.

Respondents from over 80 countries provided their views on the use of phytogenic feed additives (PFAs) in livestock within the framework of the 2018 BIOMIN Phytogenic Feed Additives Survey.

Views from nutritionists, veterinarians, business owners, CEOs and consultants accounted for more than half of the completed questionnaires (*Table 1*). In total, 758 respondents from 87 countries across the world (*Figure 1*) answered the survey in December 2017. The sample group included many key decision-makers. More than three-quarters (82%) of respondents played a role in selecting feed ingredients for their organization. The feed industry and consultants accounted for 42% of responses, followed by those working in the poultry sector (21%), including broiler and egg producers, integrators, breeders/hatcheries and turkey farms. Respondents from academic and research institutions accounted for 13%, as shown in *Figure 2*. Opinions were gathered from respondents representing the poultry, swine, ruminant and aquaculture industries.

Table 1.

Role of respondents

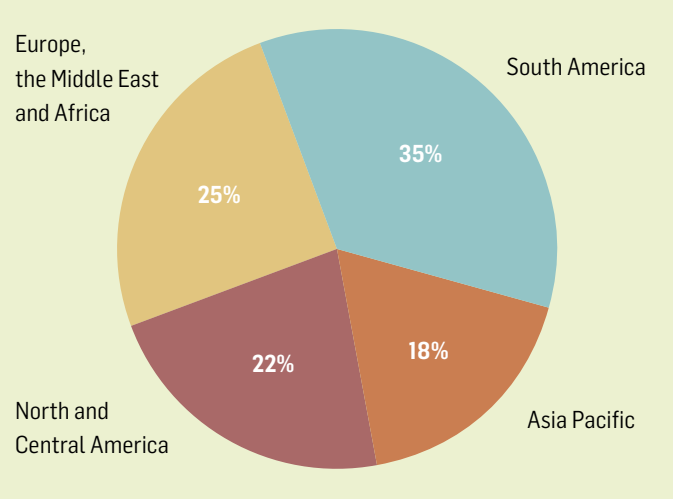
Veterinarian	18.9%
Nutritionist	17.7%
Scientist/Researcher/Academic	14.1%
Sales/Marketing	9.6%
CEO/Owner/Managing Director	9.4%
Consultant	8.7%
Grower/owner	6.7%
Live production manager	5.9%
Other	5.4%
Quality Assurance/Quality Control/Procurement	3.6%

n = 758

Source: BIOMIN Phytogenic Feed Additives Survey, 2018

Figure 1.

Survey respondents by region



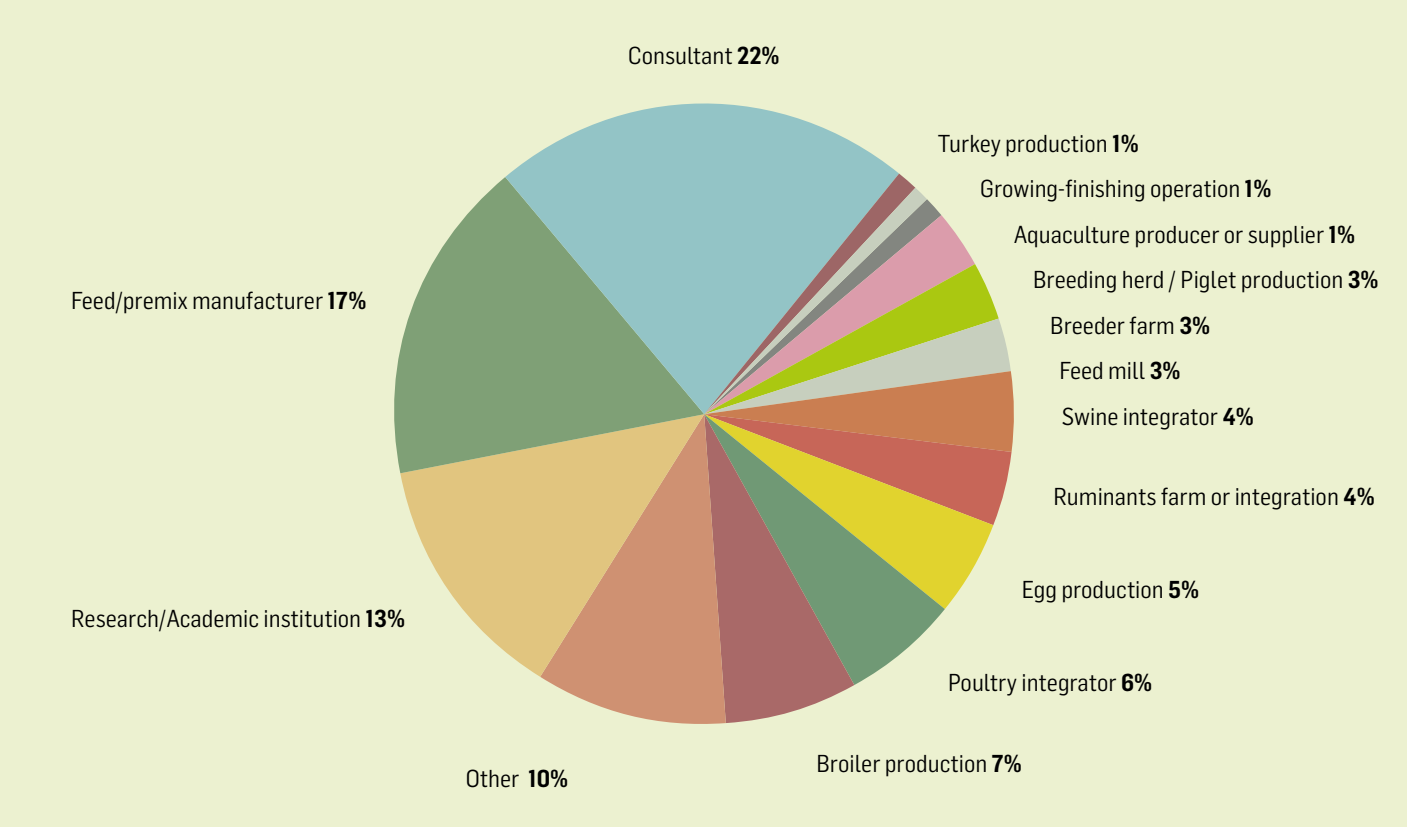
n = 735

Source: BIOMIN Phytogenic Feed Additives Survey, 2018

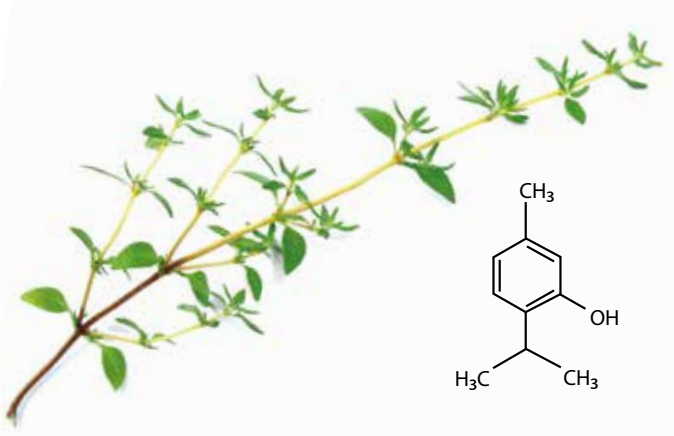
User base

Just over half the respondents (51%) indicated that they currently used PFAs as part of their poultry or livestock feeding program. 11% of the respondents had used PFAs in the past but were no longer using them, while 38% had never used PFAs (*Figure 3*).

Figure 2.
Businesses represented by respondents



n = 758
Source: BIOMIN Phytogenic Feed Additives Survey, 2018

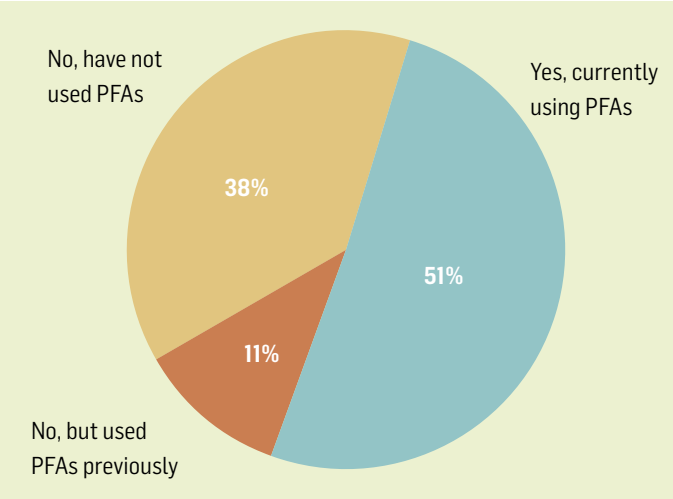


Respondents in Asia Pacific showed the highest rate of PFA use of any region at 65%. In South America, the majority of respondents (53%) indicated that they currently used phytogenics, followed by the North and Central America (47%). Respondents in Europe, the Middle East and Africa were least likely to use PFAs, but 43% of respondents still indicated current use.

By job profile, nutritionists were supporters of PFA use, with 65% of nutritionists identifying themselves as current users, followed by veterinarians (56%) then business owners, CEOs and managing directors (55%).

By business type, feed manufacturers and feed millers reported current PFA use with 70% and 63% answering yes, respectively.

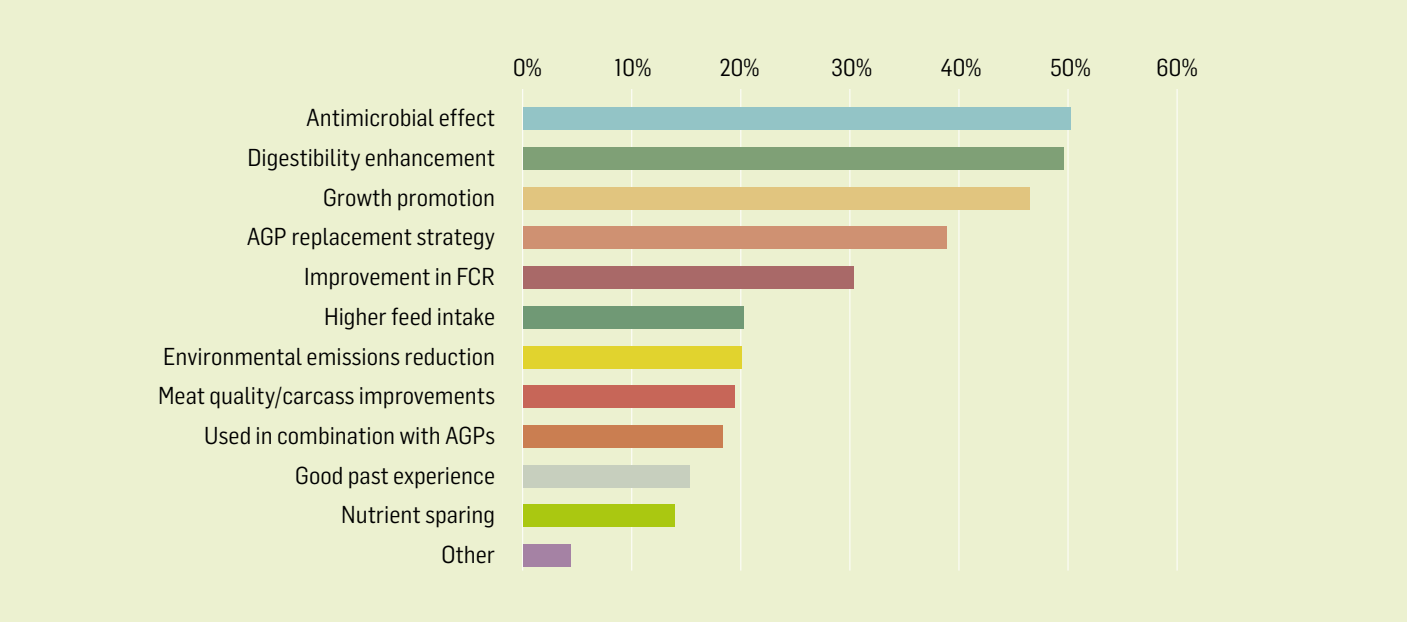
Figure 3.
Do you currently use phytogenic feed additives?



n = 758
Source: BIOMIN Phytogenic Feed Additives Survey, 2018

For context, PFAs are applied to approximately 3% to 5% of global livestock feed tonnage each year. This suggests that the respondent group was not a fully representative sample of all feed and livestock producers around the world. However, the roughly equal split of users and non-users provides a useful comparison of the motivations and views between the two groups.

Figure 4.
Top reasons that respondents gave for PFA use



n = 1428
Source: BIOMIN Phytogenic Feed Additives Survey, 2018

Motivations for PFA use

The antimicrobial effect of PFAs was the most popular reason given for their use, cited by 50.1% of respondents (*Figure 4*). Digestibility enhancement was another important reason for PFA use cited by 49.6% of respondents. Respondents also used PFAs for growth promotion (46.3%), within an antibiotic-growth promoter (AGP) replacement strategy (38.9%), for their anti-inflammatory effects (38.9%) and for improving feed conversion ratio (FCR; 30.2%).

Antimicrobial effect

Phytogenic ingredients are known for their antimicrobial properties, particularly against Gram-positive bacteria.

Respondents in South America were most strongly convinced by the antimicrobial properties of PFAs at 53.8%, followed by Europe, the Middle East and Africa (50.6%), North and Central America (48.7%) and Asia Pacific (44.8%).

Digestibility enhancement

Specific plant compounds can improve digestibility by supporting digestive secretion of bile, mucus and saliva, as well as enhancing enzyme activity.

Respondents from North and Central America and those from Europe, the Middle East and Africa, said they used PFAs for the digestibility enhancement effects, with 56.4% and 56.8% of respondents in each region respectively. Those in Asia Pacific and South America selected digestibility improvement at an equal rate of 44.8%.

Growth promotion

The growth promoting effects of PFAs stem from a combination of antiseptic, anti-inflammatory, anti-oxidative and digestion-enhancing properties.

The growth promoting effects of PFAs received the highest recognition from professionals in Europe, the Middle East and Africa, at 55.6%, followed by North and Central America (48.7%), Asia Pacific (44.8%) and South America (40.7%).

AGP replacement strategy

PFAs can play a role in a holistic approach to antibiotic reduction that incorporates biosecurity, vaccination, farm management and nutrition improvements.

A full 62% of survey respondents indicated that they expected to decrease the use of antibiotics in farm animals over the next 12 months.

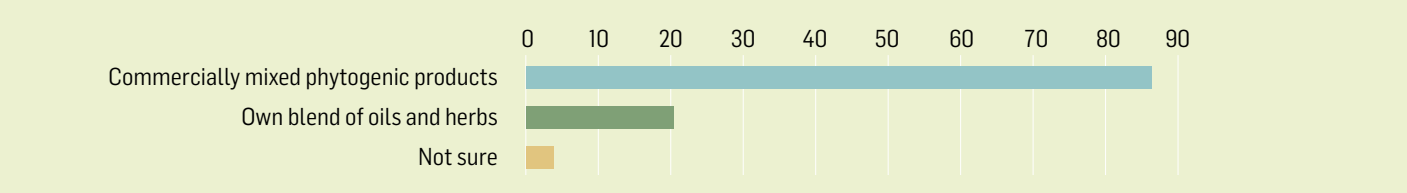
Respondents in Asia Pacific cited the use of PFAs in AGP replacement more than any other region, at 51.7%, followed by Latin America (43.4%), North and Central America (32.1%) and finally Europe, the Middle East and Africa (23.5%).

Improvement in FCR

Application of a properly formulated PFA may deliver an FCR improvement of up to 5 points.

Overall, an improved FCR found moderate support across all regions. An improvement in FCR was chosen as the main reason for PFA use by professionals in North and Central America (33.3%), followed by Europe, the Middle East and Africa (32.1%), South America (29%) and Asia Pacific (27.6%).

Figure 5.
Which type of phytogenic product do you use?



n = 419
Source: BIOMIN Phytogenic Feed Additives Survey, 2018

Anti-inflammatory effects

Considerable energy may be wasted because of inflammation: energy that would otherwise be used for growth and performance. Application of plant-derived substances such as PFAs that counter inflammation are therefore a viable, non-antibiotic method to promote growth in farm animals.

The anti-inflammatory effects of PFAs were cited much more frequently by respondents in Europe, the Middle East and Africa (55.6%) compared to other regions. Respondents in North and Central America cited anti-inflammatory effects 38.5% of the time, followed by those in Asia Pacific (33.3%) and South America (33.1%).

Higher feed intake

Phytogenics can improve the palatability of feed and thereby improve feed intake, which is particularly desirable in young animals or when feeding less palatable or medicated feed.

Improving feed intake was more highly appreciated by respondents in Europe, the Middle East and Africa (27.2%) and North and Central America (23.1%) compared to those in Asia Pacific (19.5%) and South America (15.2%).

Environmental emission reduction

As PFAs improve feed efficiency and digestibility, less feed is needed per unit of output (meat, eggs or milk), meaning that the environmental footprint of farm animals is lower.

Interestingly, this factor was most appreciated by respondents in Asia Pacific (28.7%), followed by North and Central America (23.1%), South America (18.6%) and Europe, the Middle East and Africa (9.9%).

Meat quality and carcass improvements

PFA application can be beneficial in terms of meat quality characteristics that are additional to the digestibility and feed efficiency improvements.

The use of PFAs to improve meat or carcass quality found the greatest favor among respondents in Asia Pacific (26.4%) and Europe, the Middle East and Africa (24.7%), followed by South America (15.2%) and North and Central America (14.1%).

Use in combination with AGPs

Respondents in South America were most likely to use PFAs in combination with antibiotic growth promoters, at 26.9%, compared to those in Asia Pacific (18.4%), North and Central America (12.8%), and Europe, the Middle East and Africa (7.4%)

Good past experience

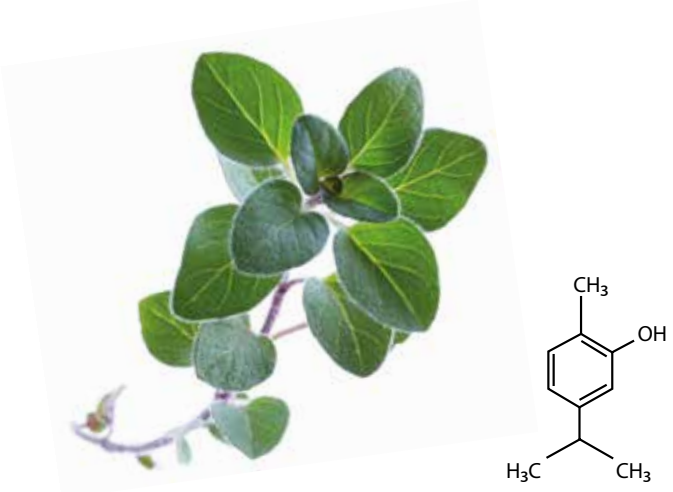
Industry professionals in North and Central America gave greater weight to good past experience of PFA use (21.8%) compared to their counterparts in other regions, such as Europe, the Middle East and Africa (17.3%), Asia Pacific (14.9%) and South America (11%).

Nutrient sparing

The use of PFAs as a tool to support the down specification of diets was most popular in Europe, the Middle East and Africa (17.3%), followed by South America (15.9%), North and Central America (12.8%) and Asia Pacific (8%).

Commercially mixed products widely favored

Of the respondents who currently used PFAs, 86% purchased commercially mixed products available from feed additive producers, while 20% applied their own blend of oils and herbs and another 3% were unsure of the provenance of the PFA products used (*Figure 5*). Respondents were able



to select more than one answer and the results indicate that some respondents combine commercially available PFA products with their own blends of oils and herbs.

Application methods

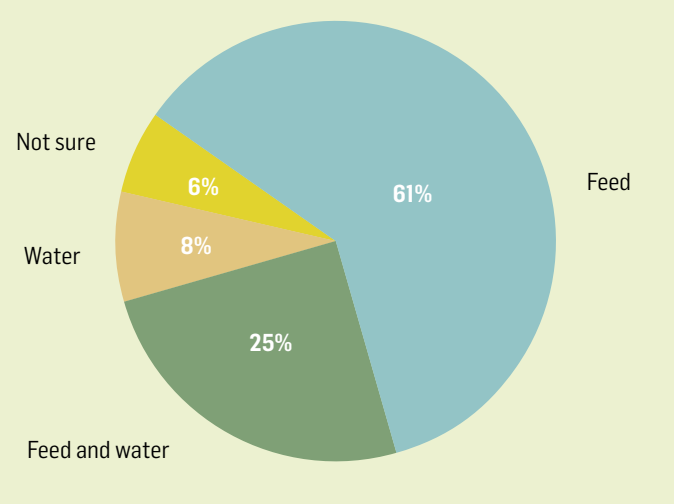
Respondents preferred applying PFAs via the feed (61%) compared to water application (8%), although many respondents chose both (25%) (*Figure 6*).

Extent of PFA use and production stage

Respondents were asked what percentage of their animals received PFAs at some stage in the production cycle. Responses indicated that the extent of phytogenic use is evenly spread, as shown in *Figure 7*. Nearly 40% of respondents indicated that the majority of their animals received PFAs, while more than one quarter of respondents applied PFAs to between 20% and 49% of their animals. Another quarter of respondents applied PFAs to less than 20% of their animals.

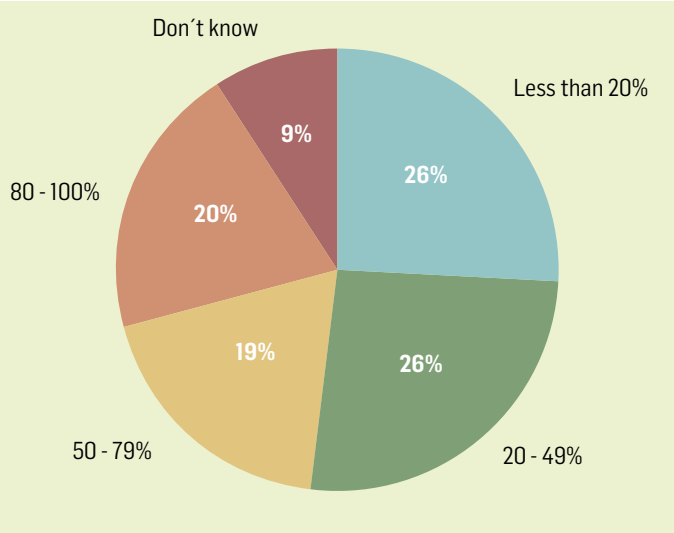
PFA application was most common in the first seven days of broiler production, during the pullet phase of layer/breeder production, in nursery to weaning piglets, and in lactating dairy cows as well as in calves and beef cattle.

Figure 6.
PFA application method preferences



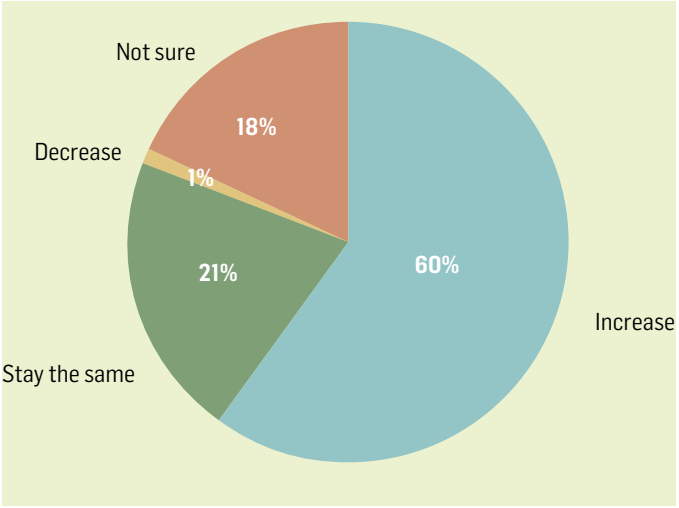
n = 388
Source: BIOMIN Phytogenic Feed Additives Survey, 2018

Figure 7.
What percentage of your herd/flock receive PFAs?



n = 390
Source: BIOMIN Phytogenic Feed Additives Survey, 2018

Figure 8.
PFA use intentions for the next 12 months



n = 390
Source: BIOMIN Phytogenic Feed Additives Survey, 2018

Intention to increase PFA use

When asked about their future plans, the majority of respondents (60%) indicated that they planned to increase their PFA usage over the next 12 months. 21% expected to maintain their current level of PFA use, while 18% were unsure. Only 1% planned to decrease PFA use (*Figure 8*).

These expectations support the strong growth in demand for PFAs for farm animals globally, and are in line with projections that the PFA market will surpass the US$1 billion threshold by 2023.

Commercially mixed PFAs offer a number of advantages, including:

- robust quality control measures ensure the final product contains a suitable amount of active substances
- formulation can be tailored to optimize the benefits in a given species
- encapsulation ensures proper delivery of phytogenic substances where they are needed in the animal's gastrointestinal tract
- thermostability to withstand the pelleting process

What Dozens of Poultry Trials Tell Us About Phytogenics and Profitability

Performance and meat quality improvements stemming from phytogenic feed additive application are key to better economic results.

Michael Noonan MBA
Global Product Line Manager Phytogenics

Our scientific understanding of the application of phytogenic feed additives (PFAs), or botanicals, has progressed considerably over the past decades. At the same time, BIOMIN has grown its practical experience of PFA application through partnerships with feed and livestock producers looking to achieve better performance outcomes. In total, 64 field trials on PFA supplementation in different poultry species have been conducted over the years. Here we examine results from the most recent trials.

The science

Plant-based compounds, specifically essential oils from herbs and spices, are known to have a broad range of biologically active properties that can be applied in modern animal production. These include anti-oxidant, anti-inflammatory, anti-microbial and digestion-enhancing effects, among others.

IN BRIEF

- Phytogenic feed additives are plant-based compounds with a range of biologically active properties.
- Digestarom® from BIOMIN has been used in over 64 commercial poultry field trials.
- Improvements in BW, FCR, productivity index, and laying rate can be attributed to PFA supplementation.

The modes of action of PFAs in livestock are backed by academic research. Essential oils may possibly improve the immune status in birds (Reisinger *et al.*, 2011). PFA supplementation in broiler diets has been shown to improve the digestibility of protein, fat, calcium and phosphorus (Amad *et al.*, 2011; Mountzouris *et al.*, 2011). Most importantly, the addition of PFAs can improve the performance and productivity of birds by improving feed conversion (Windisch *et al.*, 2008).

In addition to scientific backing, practical, commercial field trials under different production conditions attest to the benefits of PFAs.

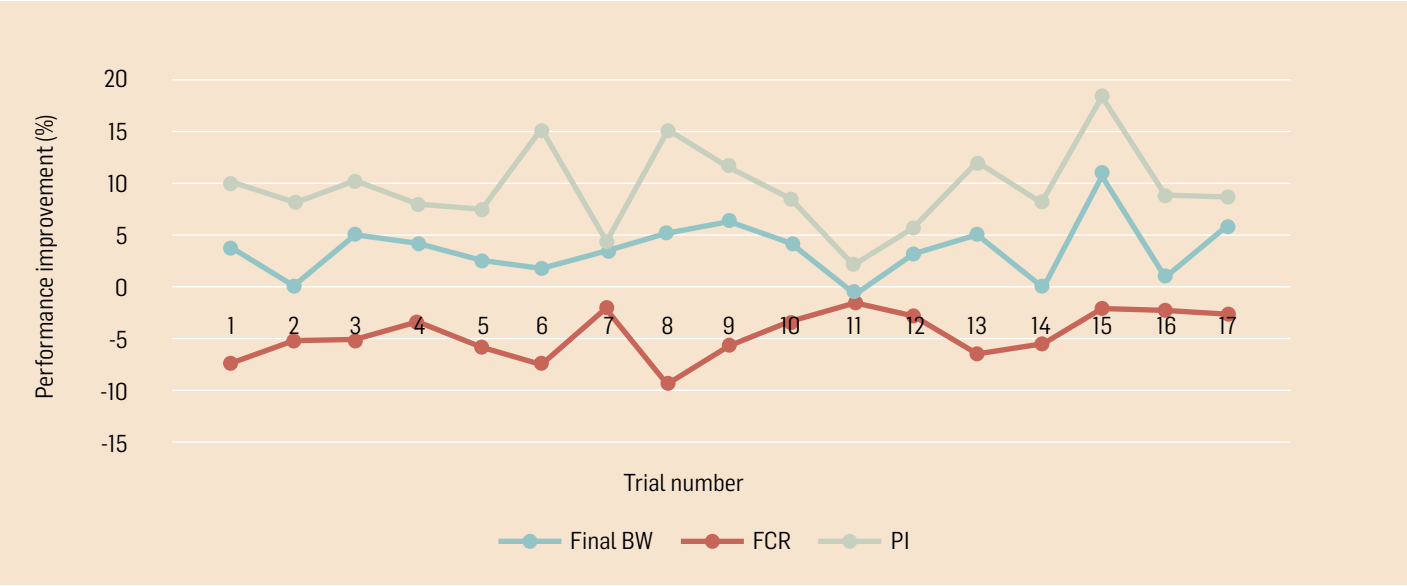
Trial results: broilers

The results of 17 broiler field trials conducted over the last five years in various locations around the world show that the productivity and economy of broiler production can be improved by adding the PFA from BIOMIN, Digestarom®, to the feed (*Figure 1*).

Across all 17 broiler trials, the average gains from using Digestarom® were improvements of 3.6% in final body weight (BW), 4.6% in feed conversion ratio (FCR) and 9.5% in productivity index (PI = % liveability x kg live weight / age in days / FCR x 100).

The return on investment was as high as 5:1 depending on the particular trial. In addition to performance parameters, carcass and meat quality parameters such as breast meat yield, final pH and drip loss were also improved by 1.3, 1.7% and 10.7% respectively. These parameters are not to be overlooked, as meat quality gains can boost the economic result of PFA supplementation by a further 10%, as found in a recent case with an integrator

Figure 1.
Summary of broiler trials with Digestarom®, performance improvement (%)



Source: BIOMIN

processing 50 million birds per year (*Figure 2*).

Furthermore, when looking at emissions, the broiler producers experienced lower CO_2, NH_3 and odor emission levels in their poultry houses as a direct consequence of the better digestibility of the nutrients. As more nutrients were absorbed into the gut, fewer nutrients ended up in the slurry, resulting in less bacterial ammonia in the environment. From both a labor and animal welfare standpoint, this provides a further benefit for workers and animals.

Trial results: breeders and layers

In eleven commercial breeder and layer trials, the effect of Digestarom® on the gastrointestinal tract manifested itself in more eggs produced, better egg characteristics and better hatchability (*Figure 3*).

Across all eleven trials, the laying rate improved by an average of 2.6% and the FCR improved by an average of 4.5% when Digestarom® was supplemented to the feed.

Another interesting finding in these trials was that despite the larger average egg size, the breaking strength of the eggshells did not decrease, which is a consequence of the better mineral digestibility in the feed.

PFAs are used in feed for their anti-oxidant, anti-inflammatory, anti-microbial and digestion-enhancing effects

Conclusion

Phytogenic feed additives have a range of biologically active properties including antioxidant, anti-inflammatory, antimicrobial and digestion-enhancing effects. PFA supplementation in broiler feed results in improvements in final BW, FCR and productivity index whilst simultaneously improving various meat quality parameters. In layers, PFA supplementation leads to improvements in laying rate and FCR without compromising eggshell quality.

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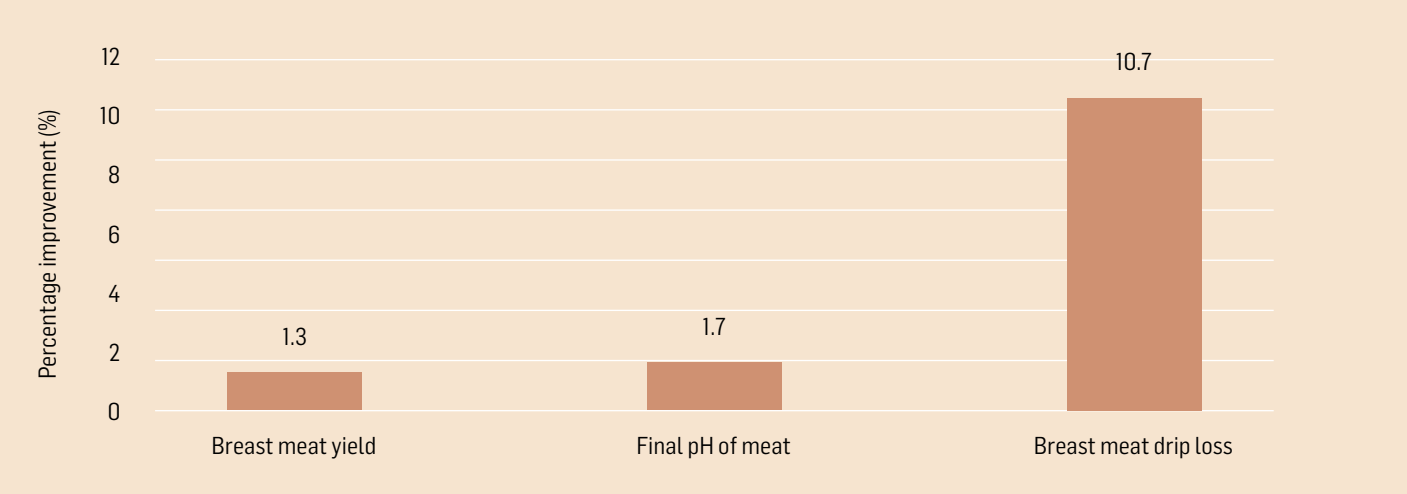
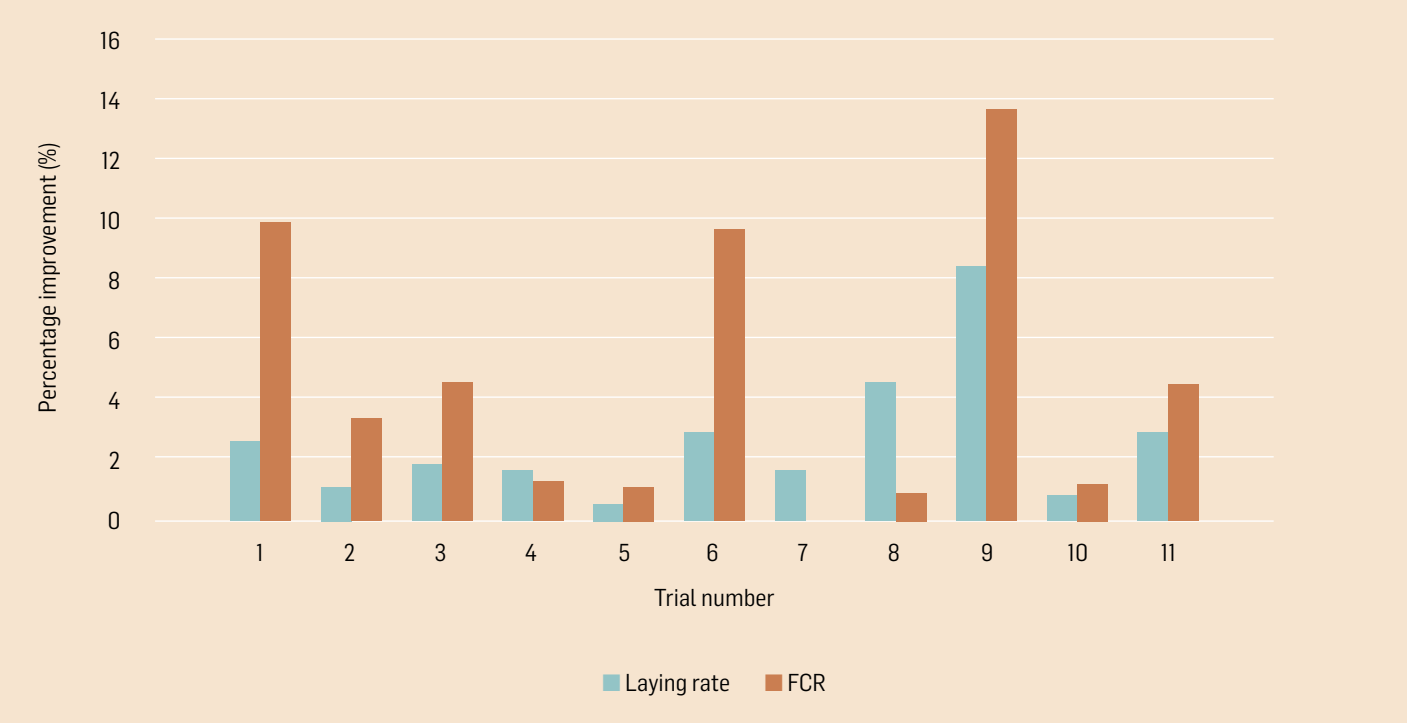
Figure 2.
Broiler meat quality improvements (%) with Digestarom®, average of 17 trials



Source: BIOMIN

Figure 3.
Breeders and layers perform better in 11 trials with Digestarom®



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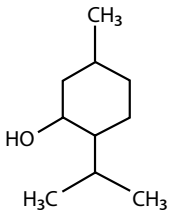

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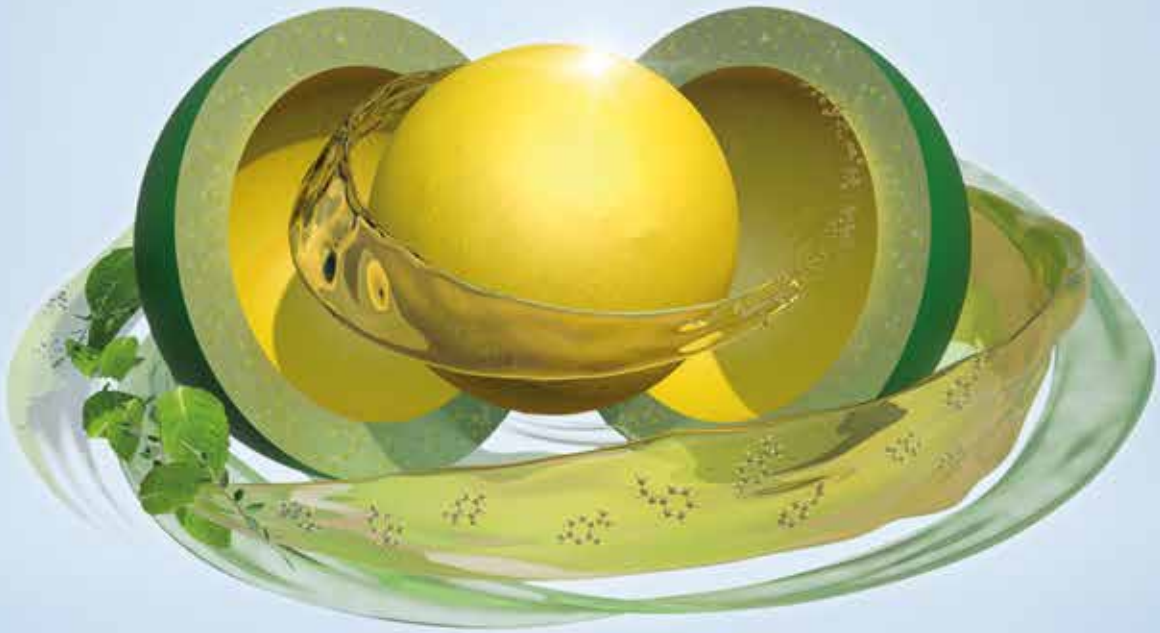

GUT PERFORMANCE MANAGEMENT

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- Triple action formulation for **better performance**
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