

Synergistically improving energy efficiency in poultry production

The world of poultry production is changing and needs advanced feed strategies designed for modern manufacturing environments. New research points to the significant benefits to be gained from taking a holistic approach – not only in terms of better energy use, but also improved nutrient digestion, gut health and overall performance.

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The rise of antimicrobial resistance, together with increasing global pressure to reduce or remove antibiotics from the food chain, is driving fundamental change within the animal production industry. It is adding a new dynamic to already unpredictable conditions and fuelling demand for viable alternative strategies to maintain bird performance.

Without the traditional use of in-feed antibiotics as the first line of defence against disease, the animal is more susceptible and will lose valuable energy reserves. In fact, studies show that during an immune response, energy is diverted away from growth and this accounts for around 25% of the total drop in performance (see Fig. 1).

These increasingly complex external



factors have accelerated developments in the science of animal nutrition. It has led to a new research approach, known as nutrigenetics, which aims to bring a deeper understanding to the interactions between three pillars: nutrition, gut and immune function and the microbiome.

This marks an innovative departure from the traditional way of thinking. Rather than looking at each of the pillars in isolation, nutrigenetics offers new insights. Achieving the optimum balance for maximum health and performance is the goal; where each aspect collaborates to create a 'favourable nutrigenetic state.'

So what does this look like in practice? And can selecting the right feed additives to create optimum conditions in the intestinal tract lead to an enhanced commercial return?

Our research into the synergistic effects of the feed additive Syncra AVI provides compelling evidence that nutrigenetics may

hold the key to unlocking the full potential of animal nutrition – even when challenges are present.

Strength in synergies

Combining two proven technologies, Syncra AVI is known to optimise gut health and maximise performance in poultry production. Its unique formulation contains enzymes, which improve nutrient digestibility and flock uniformity, and probiotics formulated to protect against health challenges and accelerate immune development.

Looked at through the lens of nutrigenetics, these positive, measurable effects can be seen to support the desired conditions in each of the three key functional areas of the intestinal tract:

● Nutrition

Results of trials demonstrate that Syncra AVI improves digestibility and uptake of key nutrients such as starch, fat and protein. Analysis shows a significant increase in Ileal Digestible Energy (IDE) with the Syncra AVI treatment, compared to using the enzymes and probiotics individually; indicating a synergistic energy response when the two products are used together.

Studies also demonstrate improved energy efficiency of the birds when fed Syncra AVI

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Fig. 1. Immune responses cost 25% of performance drops during challenge, which can be attributed to the animal.

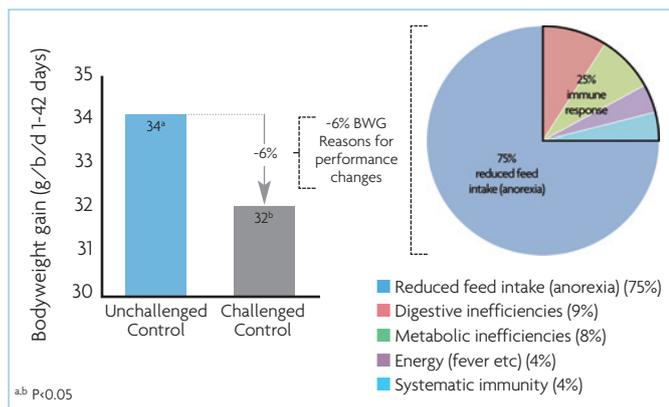
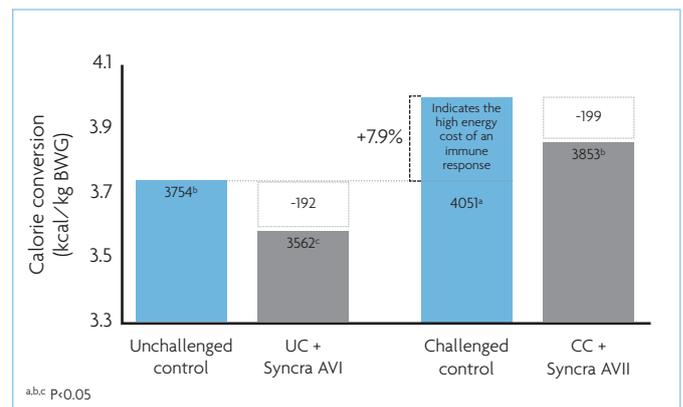


Fig. 2. Syncra AVI results in a favourable nutrigenetic state giving improved energy efficiency.



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and improved breakdown of fibre, which in turn produces arabinoxylan oligosaccharides (AXOS) which can be utilised by the microbiota in the gut.

● **Microbiome**

Syncra AVI has been shown to increase levels of beneficial bacterial populations, such as lactobacillus, while inhibiting non-beneficial bacteria. This results in a drop in the levels of opportunistic pathogens, such as coliforms, which may cause gut health issues given the right conditions. The changes in microbial populations also have a positive effect on fermentation patterns, with increased butyrate production being

observed. As a result, the microbiome is diverse and ideally balanced; where beneficial bacteria outnumber non-beneficial bacteria, and the potential for opportunistic pathogens is inhibited. All of which helps to reduce sub-clinical disease challenges which would otherwise reduce overall performance and profitability.

● **Gut and immune function**

Clear effects on gut structure are also observed, with Syncra AVI shown to improve intestinal integrity and structure, strengthening the gut barrier and optimising nutrient absorption. In addition, enhanced immune function is also demonstrated in both in vitro and in vivo studies; proving

that Syncra AVI can help reduce the risk of inflammatory responses, reducing physiological stress in the bird and the energy costs of a challenge.

For example, a high challenge in the form of necrotic enteritis (NE), caused by the opportunistic pathogen *Clostridium perfringens*, can lead to intestinal damage through the production of toxins.

Controlling the potentially detrimental inflammatory response in the bird is essential to prevent extensive tissue damage.

Our study shows that during an outbreak, Syncra AVI increases the expression of the anti-inflammatory marker, IL 10, and so dampens the pro-inflammatory IL-6 and energy expensive acute phase response.

Improved performance

Of course, what matters most from a business perspective is how these interactions in the GIT impact on overall growth and performance of the bird – particularly in view of the potential for greater challenges on health as a direct result of widespread restrictions on the use of antibiotics.

Evaluation of calorie conversion data gathered from a study carried out on broilers shows that the effect of Syncra AVI on the three pillars of nutrification – nutrition, microbiome, and the gut and immune function – results in a more energetically efficient bird that requires less energy per kg of liveweight gain. Crucially, an improved performance with the use of Syncra AVI is observed even when a challenge is present (see Fig. 2).

Importantly, analysis of this data provides an indication of the energy cost of the immune response in challenged birds; they require more calories to be fed per kg growth than the unchallenged birds. This is likely due to energy being diverted towards fighting the pathogen and away from growth.

However, the study also shows that in the presence of a challenge, the multi-pronged mode of action of Syncra AVI helps to restore balance in the GIT environment and maintain performance at the level of the unchallenged bird.

It is important to note that Syncra AVI is just one example of how technically-advanced feed additives can positively influence nutrition, the microbiome and the gut and immune function to create a favourable nutrification state.

This illustration adds further weight to the argument that gut health additives should always be added to animal feed to secure the fragile equilibrium essential for good intestinal health and optimum performance.

With this information, producers and nutritionists can more fully evaluate synergistic effects of the chosen feed strategy and make better informed decisions. ■