



Utilizing a Comprehensive Enzyme Strategy to Improve Layer Ration Efficiency

Impact on Feed Utilization and Egg Quality

KERRY

Utilizing a Comprehensive Enzyme Strategy to Improve Layer Ration Efficiency

The Challenge

Non starch polysaccharides (NSP) present in layer feed ingredients negatively affect the nutritional value and digestibility of the diet. Furthermore, non-digestible fractions of polysaccharides other than arabinoxylans and β -glucans can heighten these detrimental effects on the digestibility and nutrient release from various raw materials. Oligosaccharides from soybean meal (SBM), quantified as 7-10%, can go undigested and cause negative effects due to the lack of specific enzymes to hydrolyze them within the animal gastrointestinal tract.

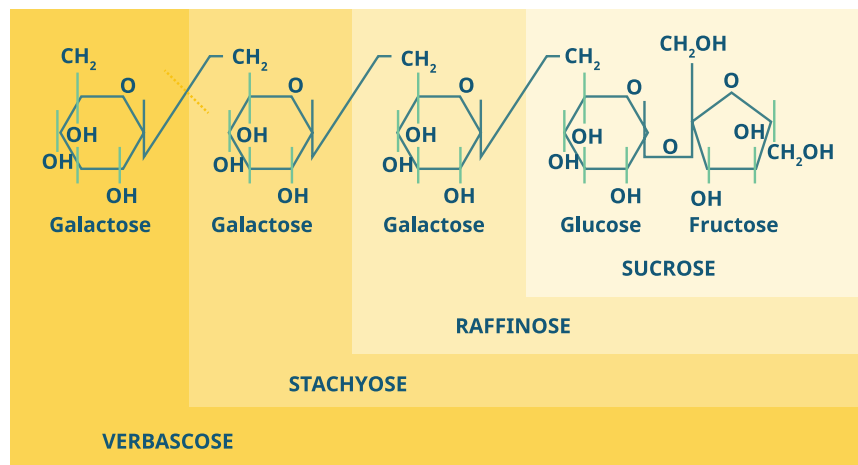
The quality of eggs is directly associated with the hen's diet. It is widely accepted that as much as 10% of eggs are uncollectable due to factors including cracked or broken eggs. Additional profit losses can occur if eggs are downgraded because they don't meet hygiene standards.

Our Solution

Kerry AlphaGal™, a multi-carbohydrase enzyme, can target both the oligosaccharides and other NSP in the diet, therefore releasing additional value to the feed.

Kerry AlphaGal™ can help:

- Maximize the nutritive value of feed
- Reduce the effect of anti-nutritional factors in feed
- Improve feed digestibility with reduced ME by sparing more energy and amino acids
- Decrease feed cost and improve the profitability of egg production



% (DM)	Raffinose	Stachyose	Verbascose	Total OS
Corn	0.2	0.1	n/a	2.0
Soybean	1.9	5.2	0	7.1
DDGS	0.2	0	n/a	0.2
Wheat	0.4	0.2	n/a	1.9
Canola	0.2	0	n/a	0.2
Beans	0.2	1.6	3.4	5.4



Study Results

INCREASED METABOLIZABLE ENERGY (ME)

As feed costs remain volatile, maximizing the nutritional density of laying hen diets is crucial for reducing input costs without negatively influencing performance. One proven strategy is using exogenous enzymes to improve energy utilization to help reduce the need for added fat into the diet.

This study observed the impact of AlphaGal, a multicarbohydase enzyme on energy density over a 30-week period and found that

this comprehensive enzyme strategy restored laying rates despite a forced reduction in energy density of 75 kcal/kg feed (Fig. 1). Similarly, AlphaGal was found to improve feed conversion efficiency during lay, allowing for the use of low-cost, less energy-dense diets without compromising feed efficiency (Fig. 2). The results of this study further support additional commercial data showing the positive impact of AlphaGal on feed conversion (Fig. 3).

Figure 1. Effect of energy density (positive control (PC), negative control, NC = PC-75 kcal/kg) and AlphaGal (-/+)

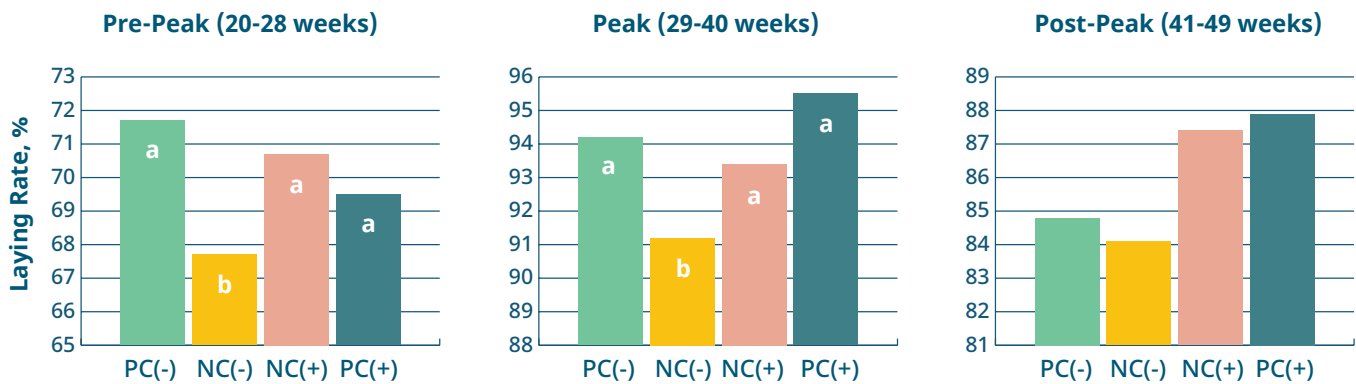


Figure 2. Effect of energy density (positive control (PC), negative control, NC = PC-88 kcal/kg) and AlphaGal (+) on the feed conversion rate of hens over a period of 16 weeks (24-40 weeks of age).

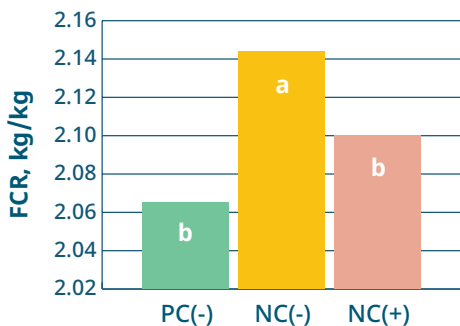
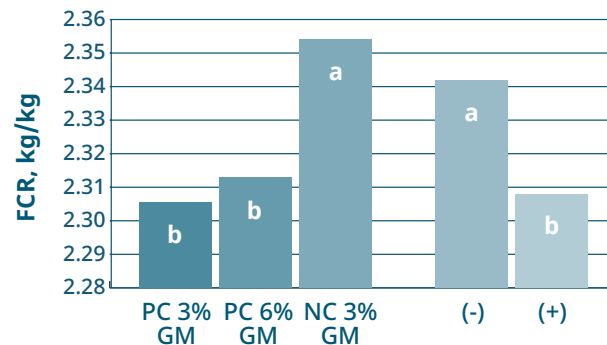


Figure 3. Effect of diet formulation (positive control with 3 or 6% guar meal (GM), or negative control (NC = PC-100 kcal / kg)) or supplementation with AlphaGal (-/+)



Study Results

IMPROVED FEED DIGESTION AND EGG CLEANLINESS

Typical layer feed formulations are a source of poorly digestible substrates, some of which may cause anti-nutritional effects that can interfere with osmotic conditions in the gut, reducing retention time and increasing moisture in the excreta. AlphaGal has been shown to decrease the viscosity of the digesta in the ileum of hens (Fig.4) because it can hydrolyse anti-nutritional factors such as oligosaccharides from the raffinose series and/or other NSP present in the diet. By improving the digestion conditions and the physical characteristics of the digesta, AlphaGal, under experimental and commercial conditions has been found to help reduce the proportion of dirty eggs and subsequently improve the share of marketable eggs (Fig. 5).

Figure 4. Effect of AlphaGal on the viscosity of the digesta in the jejunum and ileum of hens at 40 weeks, after 16 weeks of intervention in the diet.

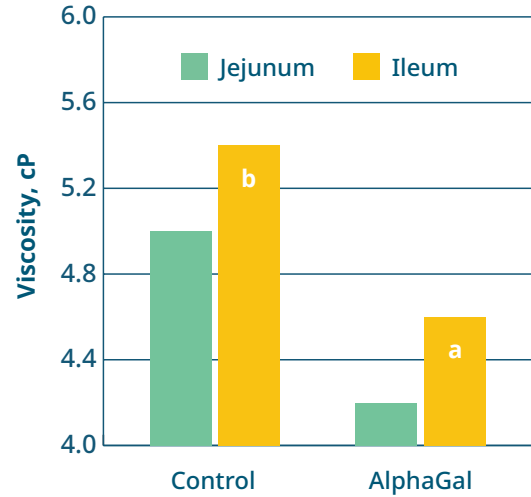
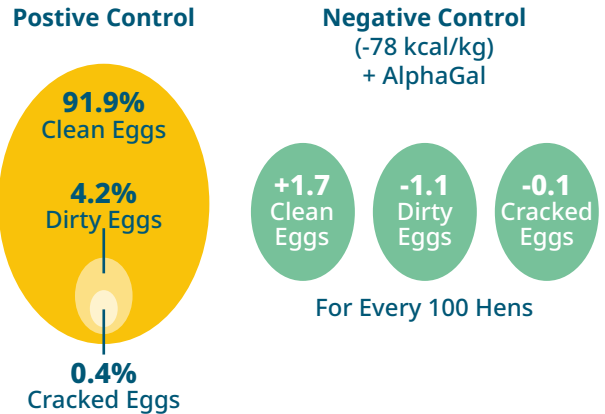
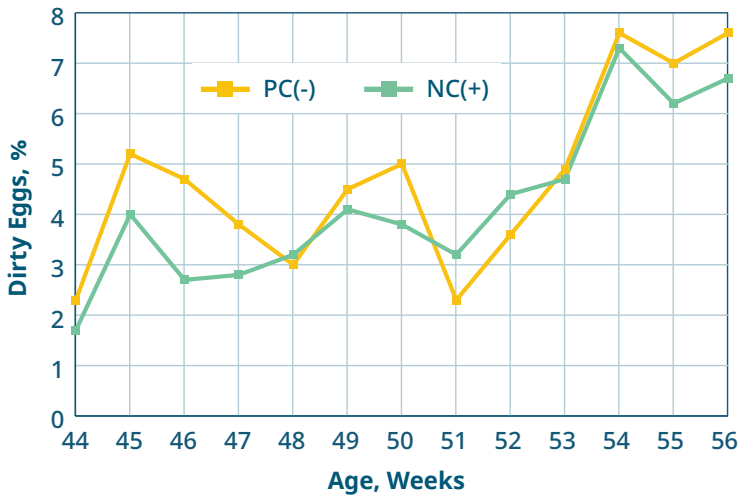


Figure 5. Effect of AlphaGal on the number of clean, marketable eggs under experimental conditions.

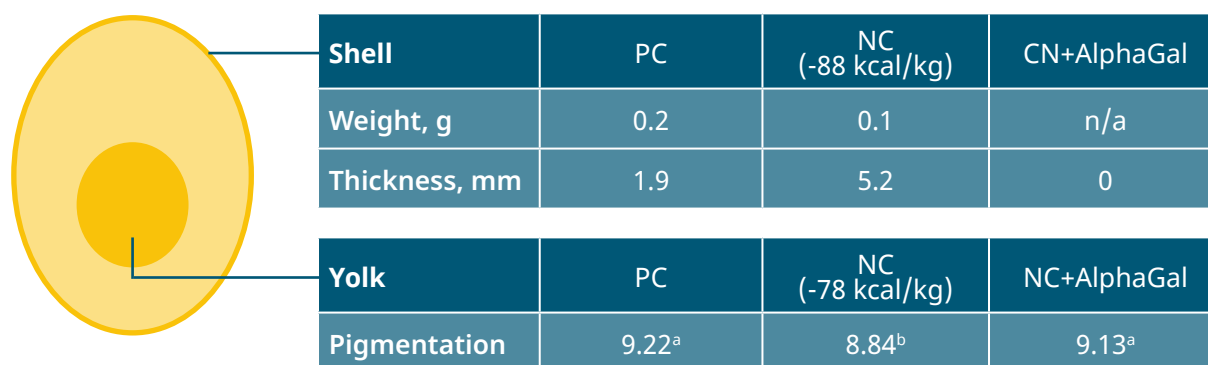


Study Results

IMPACT ON EGGSHELL QUALITY AND YOLK PIGMENTATION

Adding AlphaGal to diets with low energy density has been shown to support eggshell integrity maintenance. Further evidence also highlights improved yolk pigmentation in comparison to a nutrient-limiting diet with suggested improved lipid digestibility and pigment deposition in the egg (Fig. 6).

Figure 6. Effect of AlphaGal on eggshell quality and yolk pigmentation.



IMPLICATIONS FOR YOUR BUSINESS

1. Incorporating a comprehensive enzyme strategy that targets multiple anti-nutritional components is an effective solution to help reduce the cost of production whilst favouring sustainability targets and flexibility in feed formulations.
2. Choosing the right multi-carbohydrase, such as AlphaGal can help deliver unique functionality through the presence of alpha-galactosidase enzyme and minimize anti-nutritional effects in laying hen diets.
3. Benefits on formulation costs through AlphaGal can be coupled with increased product quality with cleaner eggs, strong eggshells and rich yolks.



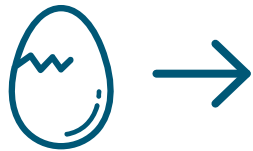
Take a closer look at your feed strategy to produce efficient and profitable eggs.

Challenge:

Modern layer diets often include undigestible feed components which can reduce feed efficiency and egg quality.

UNCOLLECTIBLE EGGS

As much as **10%** of eggs are uncollectible because of factors such as cracked or broken shells

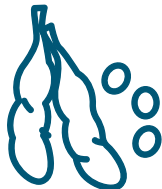


For a 100,000 henhouse, this is equivalent to **throwing out nearly 3 million eggs annually**



UNDIGESTIBLE FEEDSTUFFS

Soybean meal is commonly used in high amounts in layer rations



+ **Wasted Nutrients**
+ **Increased moisture** in the excreta



Our Solution:

Kerry AlphaGal™ can help hens utilize existing feedstuffs more efficiently with cleaner eggs, strong eggshells and rich yolks.

AlphaGal is a comprehensive enzyme system that helps unlock more nutrients from existing feedstuffs and improve profit potential.



Higher Performing Feed

Unlock more available energy from diets high in corn and soybean meal.



Higher Performing Hens

+ Laying rate with low energy diets
+ Improved feed conversion ratio



Higher Quality Eggs

+ Fewer dirty eggs
+ Fewer cracked and broken shells
+ Improved yolk pigmentation



Profitable Egg Production

Improve energy utilization + more quality eggs
= Improved egg production profitability