



How Do DDGS & Enzymes Affect Hen Rations?

RESEARCH SUMMARY

Dried distillers grains with solubles (DDGS) provide a great source of digestible amino acids and energy to poultry diets. However, DDGS contain fiber which birds cannot digest well due to their lack of intestinal enzymes. As a result, commercial poultry producers often add exogenous enzymes to diets in order to improve digestion.

Research from Zagazig University in Egypt investigated how including an exogenous enzyme would affect performance when poultry received increasing amounts of DDGS. Results from this study show that feeding DDGS up to 12% of the diet did not negatively affect bird performance. The research also demonstrated how DDGS and exogenous enzymes can improve egg yolk color.

BACKGROUND

As a very general classification, fiber consists of a matrix of cellulose, lignin, and hemicellulose chains (Figure 1) all interwoven together. More specifically, these chains contain individual sugars and groups of sugars such as non-starch polysaccharides (NSPs).

In order to utilize these sugars, animals need to break down the sugars or polysaccharides into individual units using specific enzymes. Ruminants rely on bacteria in the rumen to break down fiber. Monogastric animals have minimal gut bacteria and limited enzyme activity. As a result, they do not degrade fiber as well as ruminants. Poultry and swine producers can partially overcome this limitation by providing a source of exogenous enzymes in the diet.

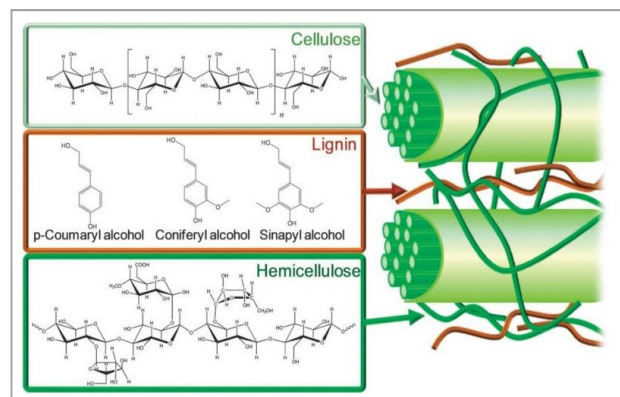


Figure 1. Structure of fiber with cellulose, lignin, and hemicellulose represented (Alonso et al., 2012)

RESEARCH

In order to investigate how providing exogenous enzymes would affect laying hens fed DDGS, Abd El-Hack and coworkers fed laying hens one of eight diets in a 2 × 4 factorial arrangement. Treatments included diets with or without enzyme and either 0, 6, 12, or 18% DDGS. The researchers measured performance of the birds in addition to egg quality characteristics.

RESULTS

Including up to 12% DDGS in the diet did not affect the majority of performance measures. Egg mass (Figure 2) did not differ until researchers included 18% DDGS in the diet. Additionally, most performance measures did not change with the inclusion of enzyme.

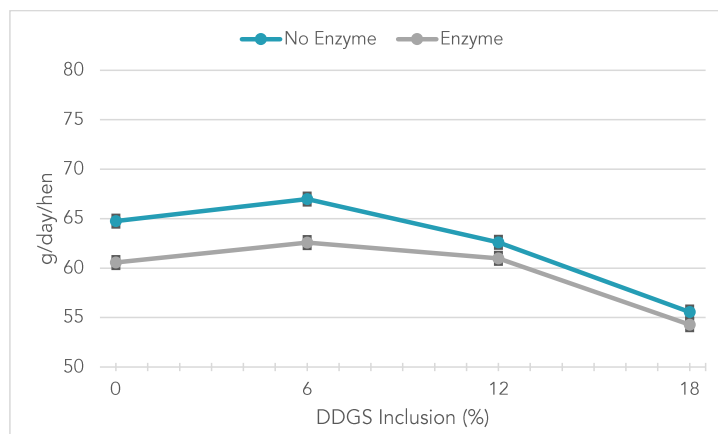


Figure 2. Egg mass of hens fed DDGS with or without enzymes (Abd El-Hack, 2019)

*These results are not a guarantee of nutritional value, as laboratory results are influenced by factors beyond the control of POET Nutrition.



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RESULTS (CONT.)

The researchers observed that including DDGS significantly ($P < 0.0001$) improved the color score of the egg yolks (Figure 3). Furthermore, the addition of enzyme also increased the color of the yolk compared with those diets that did not contain the enzyme.

DISCUSSION

Hen performance confirmed previous research which showed that including DDGS at between 10 and 15% of the diet did not negatively affect egg or shell quality. Although not addressed in the research paper, including DDGS did reduce feed costs. Based on current

Midwest ingredient prices, including DDGS at 6% of the diet reduced feed costs by approximately 1.4% compared with the control diet. Including 12% DDGS reduced feed costs by 2.6% compared with no DDGS.

Similar performance with less expensive feed means a greater return on investment for the producer. The current research also validates research showing that DDGS improves egg yolk color. For some customers, darker egg yolk implies better nutrients and a greater value. This represents additional value that the poultry producer could potentially capture.

Interestingly, enzyme addition did not affect hen performance. Potential reasons for the lack of response could include an incorrect blend of enzymes which did not match nutrients in the diet, or the dietary nutrition requirements exceeded bird requirements. In this case, additional nutrients released by the enzymes would not have provided any value.

However, enzyme addition did affect egg yolk color. Researchers suggested that the enzyme may have released additional dietary pigmentation from the cell wall contents.

CONCLUSIONS

Research continues to demonstrate that DDGS provide a source of amino acids and energy which poultry producers can use in their diet formulations. This provides options as a substitute for other ingredients which could potentially reduce feed costs and improve profitability.

If you have any questions on how Dakota Gold can provide value to you, please contact us at www.dakotagold.com!

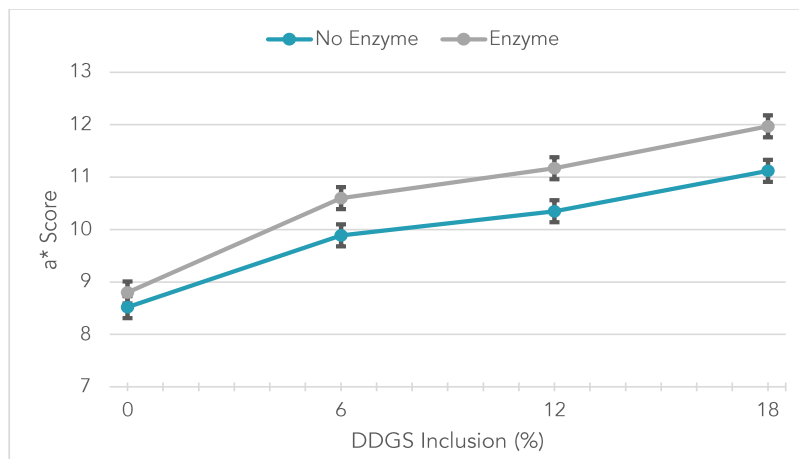


Figure 3. Yolk redness score of eggs from hens fed DDGS with or without enzymes (Abd El-Hack, 2019)

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