

## **CPRC Update – Distillers Grains May be More Useful than Previously Thought**

Nutritious feed is one of the most significant components of raising poultry and the right feed contributes to maintaining bird health and promoting growth. Feeds must be precisely formulated to ensure that the best nutrition produces the highest yields, resulting in an economical outcome for farmers.

It is estimated that feed costs make up 50 to 70 percent of expenses in poultry production. Feed costs are based on the availability of ingredients (e.g.: corn, wheat), which can fluctuate significantly in price. Feed suppliers must balance proper nutrition with available ingredients while complying with safety and legislative guidelines and processing requirements. Finding alternative ways to reduce feed costs, while maintaining nutrition, has been a priority of the poultry industry for many years.

There are a number of ways in which new ingredients can be incorporated into poultry feeds and there has been an increased focus on the inclusion of by-products from fermentation processes, known as 'distillers' grains'. The biofuel industry has grown immensely in recent years and has significantly increased the amount of fermentation by-products available but that have few uses. Harnessing this resource in poultry feeds has the potential to reduce feed ingredient while offering a practical end-use for bioethanol and biodiesel processing by-products.

### **A Different Approach**

Dr. Tom Scott and his team, based at the University of Saskatchewan, set out to determine the nutritional value of these alternative feed ingredients by evaluating the impact of various nutritional processes on feed value. The project was conducted at the *Canadian Feed Research Centre*, a new world-class facility that was built to enable innovative research, development, and commercialization of new and high-value feeds derived from low-value crops or by-products. Utilizing this new facility, Dr. Scott and his team examined the effects of including fermentation by-products in turkey feed and how processing during feed formulation might increase the nutritional value of these low-value by-products.

In order to use these low-value by-product ingredients in turkey feed, they must undergo processing in order to unleash their nutritional value. Dr. Scott and the team further assessed the benefit of adding enzymes to the feed, which react with the ingredient compounds, exposing the available nutrients for turkeys to absorb.

Secondly, the available protein within the ingredients was evaluated with the use of these commercial enzymes. Obtaining higher levels of protein from this low-value source could help reduce feed costs while lowering the amount of nitrogen that is excreted, improving environmental impacts and industry sustainability.

### **The Experiments**

A control feed without wheat distillers' dried grains with solubles (wDDGS) and an experimental feed with 30 percent wDDGS were fed to young turkeys. Each feed type was balanced to meet the minimum requirements for a turkey starter. Trials evaluated the effect of adding protease, an enzyme that reacts with protein, and beta-mannanase, to effectively degrade the complex carbohydrates in distillers' grains

to liberate additional nutrients. The young turkeys showed no differences in feed intake between the feed trials, but birds fed the 30 percent distillers' grain diet were significantly heavier, with a lower feed-to-gain ratio, as compared to birds fed the diet without distillers' grain. In addition, higher levels of distillers' grains resulted in larger gizzards and intestinal tracts, which may indicate greater demand to digest the high fibre ingredient.

Though the addition of enzymes showed little effect on performance, this study clearly showed that distillers' grains, thought to have poor nutritional value, can be incorporated into carefully balanced turkey feeds, allowing better performance and the effective use of a low-cost feed ingredient.

### **Findings**

The study's findings showed that adding enzymes to further break down the low-value ingredients has little effect on freeing up available nutrients. It is believed that the enzyme action may not have the predicted effect due to the previous enzyme action that occurred during the initial fermentation in the biofuel process, but further study in this area is required.

However, the study determined wDDGS is a potential source of valuable nutrients and can be included in a turkey starter diet at levels up to 30 percent, much higher than the traditionally recommended 5 to 10 percent in poultry diets. Dr. Scott's research indicates that the low-value ingredients can prove nutritionally adequate and cost-effective when incorporated into feed that is properly formulated and energy-balanced.

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