

Use of DDGS in Turkey Diets- Distillers Dried Grains and Solubles (DDGS)

Aviagen Turkeys Ltd ®

There is a huge increase in the production of DDGS worldwide as a by-product of fuel ethanol production for transport. USA and Brazil are leading the way followed now by plants being constructed in Europe. Traditional DDGS is used mainly in cattle feed, but with huge increases in supply it is now widely used in USA and Canada in turkey feeds.

Production of DDGS

- Grain (mainly maize in USA and Brazil but will likely be wheat or other in Europe) is ground, soaked, steam cooked and liquefied.
- This mash is cooled, yeast and amylase enzymes are added and fermentation takes place.
- Following the fermentation the liquid is distilled to yield alcohol and stillage.
- The stillage is centrifuged to yield wet grain and thin stillage.
- The thin stillage is evaporated to give a syrup which is known as the condensed soluble. This is added back to the wet grain and then it is all dried producing the DDGS.

Nutritional value

The starch and sugar is being removed so that other nutrients in the grain are concentrated by a factor of around 3 to 4. The process is inherently variable and over 50 factors have been identified that result in this variation.

The crude protein level has been shown to not be a good indicator of amino acid content. For instance the level and availability of lysine can be highly variable depending on the process. In one survey lysine has been shown to vary between 0.59% and 0.89%, fat from 3% to 12% and ash from 3% to 6%. Digestibility of lysine can vary between 40% and 75%. The newer production plants have better quality control and the fermentation and drying processes are better controlled, this results in better digestibility of material from these plants.

Lysine digestibility can be affected by overheating during the drying process and any DDGS that is very dark in colour has probably been overheated and the overall digestibility will be low. In feeding trials with broiler chicks significant reductions in performance (18% lower growth) were seen with dark burnt product versus lighter material. The colour of the material can be used as a crude but effective measure of over processing. Dark material has usually been overcooked and availability of the amino acids will be low.

Inclusion

DDGS can be used successfully in turkey diets if the concerns over quality discussed above are controlled. Levels of 2% in early diets up to 8% in later diets are being used in parts of Europe. In the USA higher levels are being used in some locations. 15-20% has been reported in some finisher diets but typical levels are around 8-12%. Quality is the main factor that limits its use.

Problems associated with using DDGS in poultry

1. There is a lot of variability in the final product in terms of its proximate analysis, although some of this can be minimised by purchasing directly from one processor rather than from a generic supplier.
2. Digestibility of amino acids can be difficult to quantify and can be subject to variability. Again specific processors tend to be consistent in their 'quality levels' but this can be quite different to other plants. Using DDGS requires formulating on the basis of digestible amino acids to avoid any loss of performance. Over processed materials that are dark or have a burned smell should not be used.
3. Any Mycotoxins or other undesirable contaminants that are present in the original grains will be concentrated in the final DDGS by a factor of 3X or 4X, so need to be checked on a regular basis, preferably prior to use.
4. The fiber levels are quite high and the energy content is lower than wheat, so high levels of DDGS inclusion need to be offset by addition of more fat.

Management Information

There is plenty of information available on DDGS value and feeding but this is mainly focused on the USA style of product which is maize based. The Bioethanol industry has sponsored a lot of research at US university and many mini conferences around the world. Most of this is accessible online or via publications.

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