



Application of Renewable Energy Co-products in Feed --- A Poultry Feed Perspective

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UTILIZATION OF BYPRODUCTS

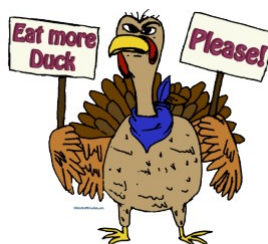
- Nutrient type and concentration (+ or -)
 - Digestibility
- Product variability
- Presence of contaminants (bird health; production of food)
- Handling characteristics & supply
- Interactions with other ingredients in feed
- Cost (vs competing ingredients/supplements)



UTILIZATION OF BYPRODUCTS

Research to
confirm best fit
and limitations

*What does the
turkey tell us
about the
product?*



RESEARCH TO ENHANCE UTILIZATION OF COPRODUCTS IN MN TURKEY FEEDS

DDGS

- Dry product form
- Residual – corn fermentation
- Source of amino acids and energy
- Partial substitution for corn and SBM in feed

Crude glycerin

- Liquid
- Residual – biodiesel production
- Glycerol
- Source of energy
- Partial substitution for corn

UTILIZATION OF DDGS-WHAT IS KNOWN

- Corn DDGS composition
 - Protein, fat, fiber, phosphorus, xanthophylls
- Processing
 - Heating and amino acid digestibility
 - Heating and phosphorus availability
- Usage levels
 - Age and poultry type
 - 5-30% possible



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RESEARCH TO STUDY MINERAL EXCESS

- Dietary Electrolyte Balance (DEB)
 - Sodium, chloride, potassium, sulfur
- Source of electrolytes
 - Corn, ethanol production process
 - Other feed ingredients and supplements
- Impact of Imbalance
 - Flock performance, excreta condition, skeletal integrity (welfare issue)



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RESEARCH QUESTION – IS DEB A CONCERN IN FEEDS WITH DDGS?

- “Short Answer” – *It depends.....*
 - Not an issue in corn/soy diets
 - Can be an issue when
 - Diet also contains canola meal (high sulfur)
 - Diet chloride level is excessive



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GLYCERIN-BIODIESEL PRODUCTION

- Glycerol
- Free fatty acids
- Sodium, potassium
- Methanol



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USE OF CRUDE GLYCERIN IN MARKET TURKEY DIETS

⊙ Glycerin Addition

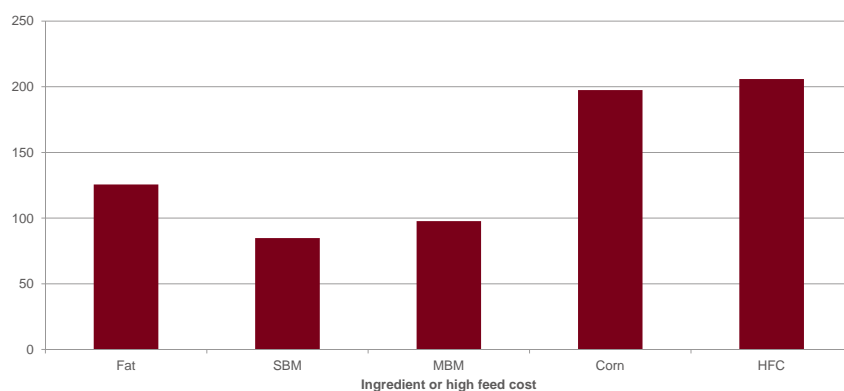
- No negative effects on performance to market with level of 6% with correction in diet protein level
- Pellet quality improved with glycerin addition



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RELATIVE VALUE OF GLYCERIN UNDER HIGH FEED OR INGREDIENT COST (% OF LOW FEED COST)



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IMPORTANCE OF RESEARCH FINDINGS-RENEWABLE ENERGY COPRODUCT FEEDING

- Coproduct feeds-high level of characterization
 - Performance; poultry health
- Processing conditions can affect final feeding value
 - Communications between plant, supplier, and nutritionist
- Value is relative to other ingredients



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DDGS FEEDING RECOMMENDATIONS

- High inclusion levels requires additional information (> 10%)
 - Amino acid digestibility
 - AA specs should include tryp, arg, val, iso
 - Met vs Met + Cys
 - Use care in use of supplemental thr
 - Less than 6% of requirement
 - Lowered protein regimens
 - Fat Content (Metabolizable energy)
 - Electrolytes Na, Cl, K, S (DEB)



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Driven to DiscoverSM

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