



EFFECTIVE USE OF COPRODUCTS IN POULTRY DIETS

Kevin Roberson, Ph.D.

CSA Animal Nutrition

INTRODUCTION

- Use of corn-derived DDGS from the dry milling process has increased in poultry rations in the 21st century
- Typical maximum inclusion levels at 10-15% of the diet where available and cost effective (research reports up to 25%- Univ. Nebraska)
- Variability of nutrient content and other factors influence the comfort level of the nutritionist
- Focus of this presentation will be directed towards usage of DDGS in the egg industry
- Advantages beyond potential ration cost savings include darker yolk from xanthophylls and reduction in ammonia production from fiber source (ISU)

INFLUENCE OF DDGS LEVEL ON YOLK COLOR

ROBERSON ET AL., (2005)

Lightness, Redness, Yellowness, Roche fan color score- 6 wk on trial

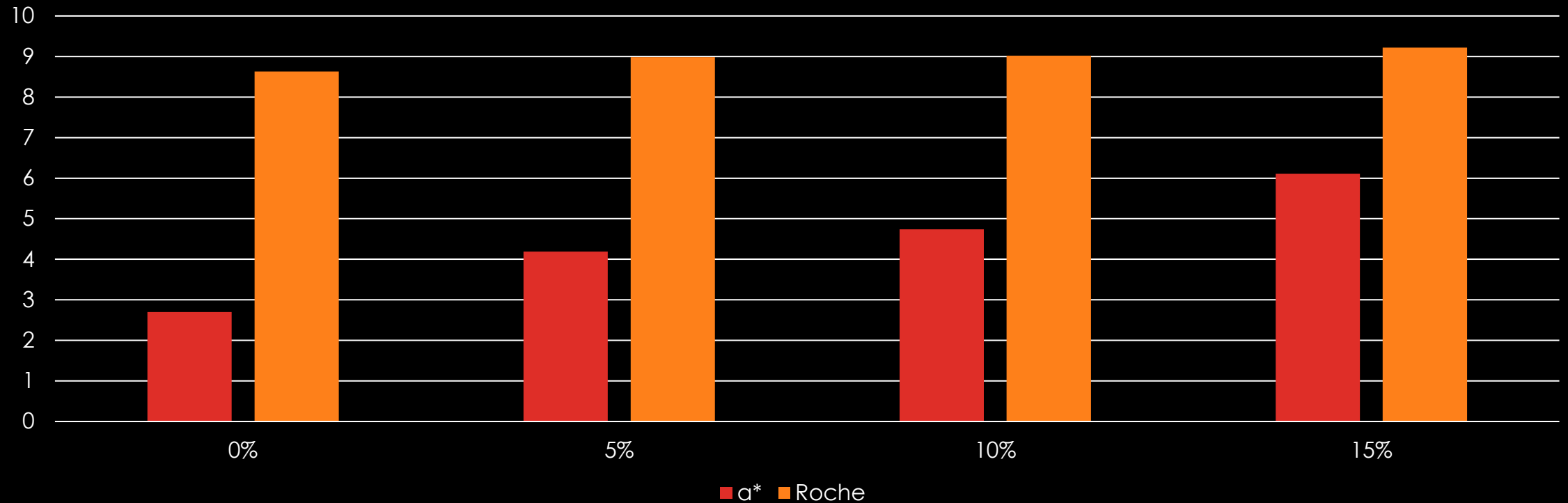


ROCHE YOLK COLOUR FAN



INFLUENCE OF DDGS ON YOLK COLOR

Redness (Minolta Chroma Meter), Roche Yolk Colour Fan Score (1965)



NUTRIENT AVAILABILITY CONCERNS

- Primary concern – Metabolizable Energy value driven by oil content
- Base value of 2750 kcal/kg (AME) used for layers at Michael Foods (Roberson, 2005 – Michigan State) based on 11.8% ether extract, 6.3 % crude fiber; changes in ME value related to proximate analysis
- Published ME equations –
Batal and Dale (2006) – crude fat and fiber most influence; protein and ash less influence
Other prediction equations have included fiber fractions, starch and gross energy

METABOLIZABLE ENERGY OF DDGS FOR POULTRY

- POET Nutrition (2011) reported ~ 100 kcal/kg decrease in TME per 1% less oil
- Dale (2013) reported a direct correlation between oil content and energy value when oil was serially extracted from DDGS samples
- University of Nebraska research estimated decrease in AME value of DDGS for laying hens as oil decreased
- Others – turkeys (Noll, MN); broilers (Dozier, Auburn)

NUTRIENT AVAILABILITY CONCERNS

- Amino acid digestibility
 - primarily lysine- related to processing, color of product
 - high DDGS levels can result in low Arginine:Lysine level
- Sodium levels
 - related to NaOH addition at ethanol plant
- Phosphorus
 - availability appears higher than previous reports

OTHER ISSUES

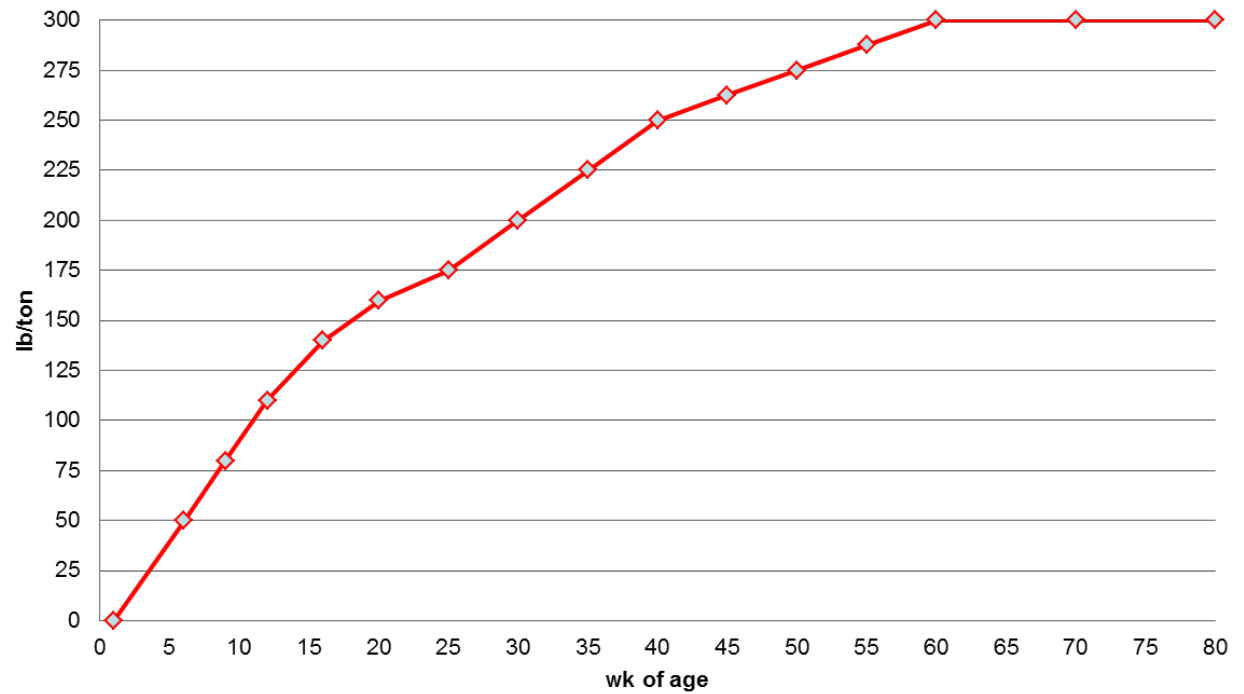
- Particle size, bulk density
flow issues at feed mill with finer product, especially summer
- Pelleting
may be an issue for meat-type birds
- Pendulous crops – turkeys (20%+ inclusion), mash diet (Roberson, 2003)
- Mycotoxins (3x vs. corn)
Michael Foods observations– aflatoxin in southeast SD, fumonisin in NE,
vomitoxin in MN, zearalenone higher in 2019
- Virginiamycin
may be a reason given to not use DDGS
- Ethanol plants idled or shut down
COVID-19 pandemic resulted in reduction/removal of DDGS in diets

USAGE OF DDGS AT MICHAEL FOODS

- 2005
none in pullet feed, start at 25 lb/ton in lay house and maximize inclusion at 150 lb/ton in post-peak production (~ 60 wk age)
- 2010
start at 40-50 lb/ton in grower stage in pullets (~6 wk) and increase weekly to 140 lb/ton at 16 wk
increase in layer feed gradually to 300 lb/ton at 60 wk of age
- Multiple sources of DDGS considered to minimize cost, but generally 3-4 options used to reduce concern about variability

DDGS LEVELS AT MICHAEL FOODS

DDGS inclusion levels in MFI pullet/layer rations



OTHER OPTIONS FOR DDGS

- High protein DDGS, corn germ meal offered as options
- Alpha-amylase technology to increase ME research offer- product overvalued

Conventional DDGS continues to be option of choice vs modified DDGS
consistent availability from multiple sources for price comparison
lack of extra bin space for commercial testing of alternatives

TAKE HOME MESSAGES

- Although some research papers report DDGS may be fed to poultry at 20% or even higher levels, **maximum inclusion level is typically 15% in layer diets**
- There are many factors to consider when using DDGS in poultry diets, but **oil content/ME value** has been the most variable factor in recent years
- Fractionation processes provide a new look at DDGS, but have yet to affect commercial feeding of poultry in my experience
- **Pricing and availability** of conventional DDGS remains the most important consideration for usage of this coproduct in poultry diets

THANK YOU!

