

Future of Feeds – New Advances in Co-products for Pigs and Poultry

LINK ENBBIO Project Findings

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Introduction

Background

- Environmental and Nutritional Benefits of Bioethanol co-products (ENBBIO)
- Impact of feeding wheat-derived DDGS
- UK-derived, sustainable and cost-effective alternatives to feeding imported proteins such as soya.

Presentation

- Summarise technical aspects of poultry and pig work conducted substantially at Nottingham
 - Reference also to commercial poultry trials

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Broilers

Trial 1

- Initial 'production' trial

(1) Performance (Feed intake, feed conversion ratio, liveweight gain)

(2) Ileal Nitrogen/AA digestibility

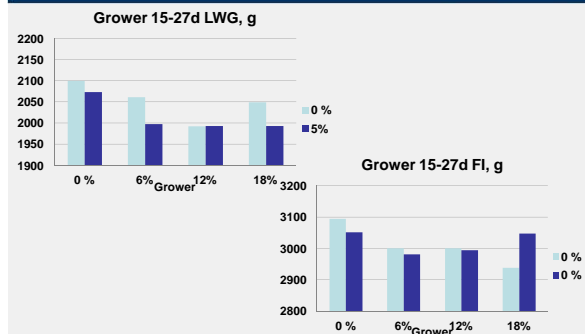
(3) Nitrogen retention

Diets based on varying levels of
W-DDGS

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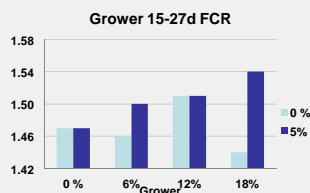
Results

- Performance



Results

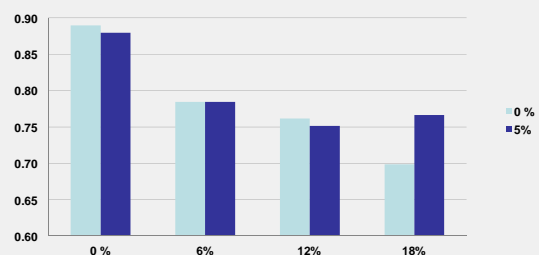
- Performance



- Performance not significantly influenced
- Numerical differences are commercially important.

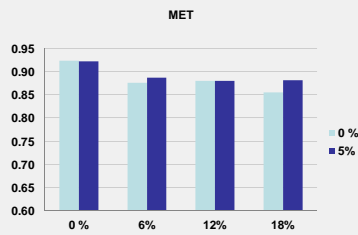
Results

- Ileal digestibility of N



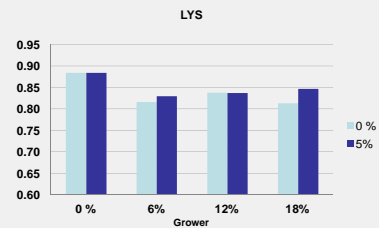
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Results - Ileal digestibility of AAs



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Results - Ileal digestibility of AAs



- Assumed values in diet formulation probably too HIGH
- Determination of actual data in next trial

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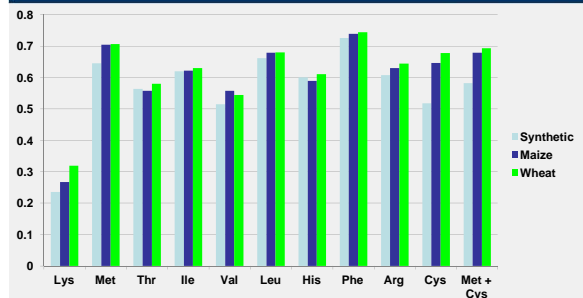
Broilers

Trial 2

- Ileal Nitrogen/AA digestibility
 - THREE basal diets based on
 - Wheat
 - Maize
 - Semi-synthetic

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Results - Ileal digestibility of AAs



- Confirms LOWER than expected, particularly LYS
 - Heating during processing key variable

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Commercial broiler trial

- Conducted at H2S
- Diets balanced and contained 10% WDDGS
 - Digestible LYS data from Nottingham

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Commercial broiler trial

- No differences in liveweight
- Better Feed Conversion Ratio with W-DDGS
- W-DDGS-based diets more expensive
 - Had to include higher levels of pure amino acids
 - Cost /kg gain lower
 - Production Efficiency Factor (PEF) higher.
- Hock marking and pododermatitis lower in W-DDGS-based diets
- Addition of 10% W-DDGS in balanced broiler diet had no detrimental effects on technical performance.
- Concerns that W-DDGS may impact litter quality not realised

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Layers

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- Major concern over the use of WDDGS (and any other 'fermentable' fibre source)
 - Performance
 - Egg shell quality
- Trial
 - Diets 0, 6, 12, 18% WDDGS in balanced diets
 - Early lay

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Performance: no effects

Dirty eggs

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Day 24

Day 28

No evidence of tarry eggs

Layers

Commercial trial

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- Based on very encouraging data from initial trial:
 - Commercial layer trial at Noble Foods
 - WDDGS at 7.5% vs control

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Layers

Commercial trial

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Results and observations

- No practical difference between the trial and control flocks.
- Concerns over potential increased seconds from using WDDGS not realised
- WDDGS can be safely used in layer diets, in part substituting for imported soya
 - Cost is a factor
- Concerns
 - WDDGS supplied non-pelleted.
 - Low bulk density made transport costs excessive
 - Difficult material to handle at the mill with significantly increased unloading time.
 - In practice it would need to be pelleted for milling and transport efficiency

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Pigs

Standard ileal digestible amino acid

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- Evaluate SID AA prior to any performance / carcass trials.
- Semi-synthetic diet employed
 - DDGS the only ingredient containing AAs
 - FIVE samples of WDDGS evaluated:
 - New wheat – maize
 - Old wheat
 - New wheat
 - Hungarian maize DDGS
 - German wheat
 - Trial conducted in USA with grow / finish pigs

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Pigs

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Amino Acid	1 New wheat – maize	2 Old wheat (2012)	3 New wheat (2013)	4 Hungarian maize	5 German wheat
Lys	0.32	0.30	0.31	0.33	0.34
Met	0.72	0.70	0.71	0.73	0.74
Thr	0.65	0.63	0.64	0.66	0.67
Ile	0.75	0.73	0.74	0.76	0.77
Leu	0.78	0.76	0.77	0.79	0.80
Val	0.68	0.66	0.67	0.69	0.70
His	0.72	0.70	0.71	0.73	0.74
Phe	0.75	0.73	0.74	0.76	0.77
Arg	0.72	0.70	0.71	0.73	0.74

Generally lower than expected, although some variation
LYS in particular had low values
Over-heating during processing?

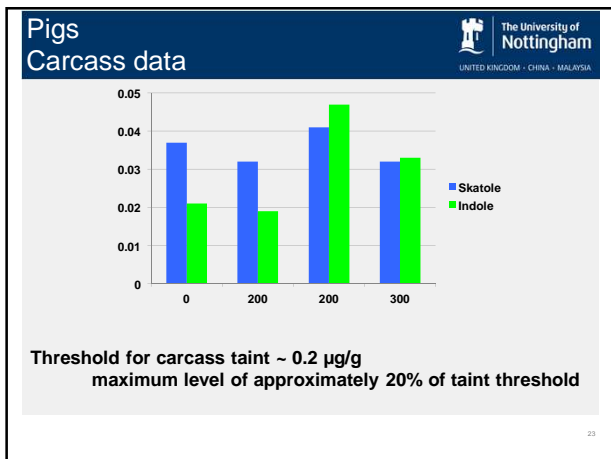
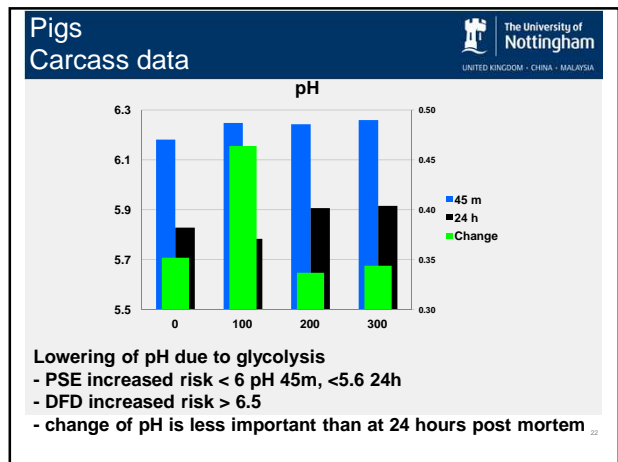
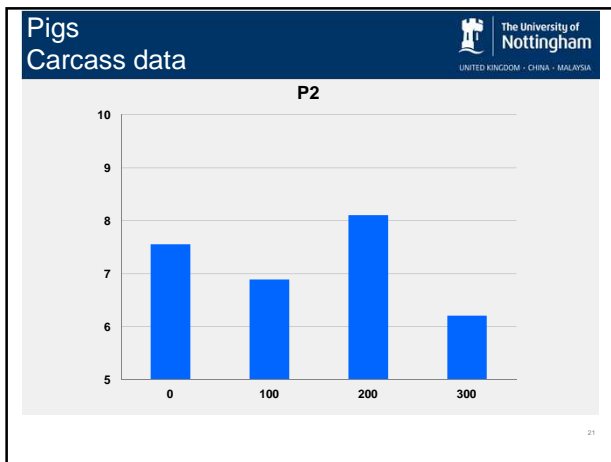
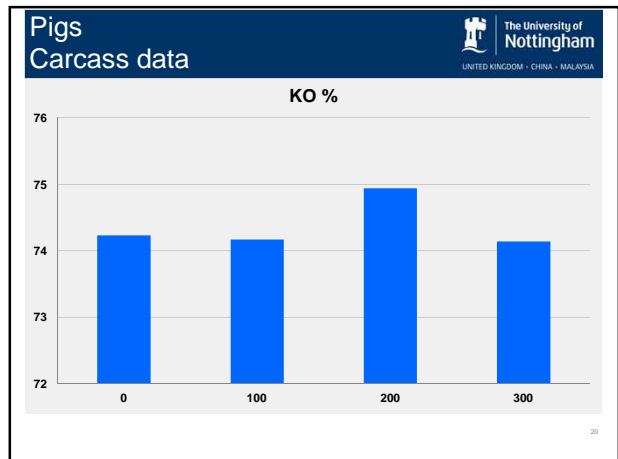
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Pigs

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- Performance / carcass quality trial
 - Graded levels of WDDGS: 0, 100, 200, 300 g/kg
 - Diets balanced for NE and SID LYS
 - Fed over grower and finisher phases to entire males

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Summary

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- WDDGS potentially a valuable raw material in diets for non-ruminants
 - Inclusion levels:
 - 18% Broilers and layers
 - 30% in grow / finish pigs
 - No adverse influence on performance, egg / carcass quality
 - Possible 'issues'
 - Overheating during processing risks reduced SID AA
 - Low bulk density compromises transport and storage

WDDGS cannot replace SBM but is a means of reducing reliance on this imported ingredient

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