

# EFFICACY OF *Buttiauxella* PHYTASE IN CORN SOYA BASED LAYER DIET ON EGG PRODUCTION PERFORMANCE AND NUTRIENT DIGESTIBILITY

A. KUMAR<sup>1</sup> AND Y.DERSJANT-LI<sup>2</sup>

<sup>1</sup> School of Agriculture and Food Science,  
University of Queensland

<sup>2</sup> Danisco Animal Nutrition/DuPont, UK



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## Conventional sources of P and their limitations

- P from grains, seeds and their by products: Low P availability (10-30%) due to phytate bond and lack of phytase in poultry
- P from animal by products: Ban on using in stock feed
- P from inorganic source: High cost, pollution and health hazard

## Alternative source of P is Phytase enzyme

Phytase enzyme can be produced from different microbes e. g.

- *E.coli*
- *Peniophora*
- *Citrobactor*
- *Buttiauxella*



## Aims and objectives of this study

Investigate the efficacy of *Buttiauxella* phytase (Aextra<sup>®</sup> PHY, expressed in *Trichoderma reesei*) on egg production performance, nutrient digestibility and bone characteristics



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# Experimental Design

- 240 ISA brown layers; 34 week study (26-60 wks of age)

- 3 treatments with 16 replicate cages each

- 1).Positive control

- 2).Negative control: Phase-1: reduced avP (by 0.2%) and Ca (by 0.16%); Phase-2: reduced avP (by 0.18%) and Ca (by 0.15%)

- 3).Negative control + 300 FTU/kg *Buttiauxella* Phytase

- 5 hens/cage

- Corn soy based mash two phase diet

## Measurements:

Production:

Egg production, Egg mass, Feed intake, FCR.

Digestibility:

DM, GE, N, PhyP, Fecal P,

Tibia:

Ash, Phosphorus and Calcium.



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# Ingredient and nutrient composition of the diets (%)

Ingredients	Positive control	Negative control	Positive control	Negative control
	Phase 1		Phase 2	
Maize	57.67	59.31	57.14	58.64
SBM, Rice bran, Oil, Lime, Salt, Vitamins, Minerals, Amino Acids and Pigments	41.07	40.59	41.83	41.36
DCP	1.26	0.10	1.03	0
Av. phosphorus %	0.33	0.13	0.29	0.11
Calcium %	3.63	3.47	3.80	3.65
CP %	16.35	16.35	16.35	16.35
ME Cal/kg	2820	2818	2811	2811



# Results

<b>Production performance (34 wks)</b>	<b>PC</b>	<b>NC</b>	<b>NC+300 FTU</b>	<b>P</b>
Egg Production (HH) %	89.96 <sup>ab</sup>	87.48 <sup>b</sup>	92.36 <sup>a</sup>	0.01
Egg Production (HD) %	91.06 <sup>ab</sup>	89.03 <sup>b</sup>	92.36 <sup>a</sup>	0.01
Egg Weight (g/egg)	66.69 <sup>a</sup>	64.72 <sup>b</sup>	67.21 <sup>a</sup>	0.005
Egg Mass (g/hen/day)	60.00 <sup>a</sup>	56.65 <sup>b</sup>	62.18 <sup>a</sup>	0.0006
Feed Intake (g/hen/day)	119.37	115.81	117.23	0.17
FCR (g feed/g egg)	1.971 <sup>a</sup>	2.012 <sup>a</sup>	1.886 <sup>b</sup>	0.001
Mortality (%)	5.00 <sup>ab</sup>	6.25 <sup>a</sup>	0 <sup>b</sup>	0.05
Weight change(g/hen)	8.69 <sup>a</sup>	-173.69 <sup>b</sup>	-47.5 <sup>a</sup>	0.0001

a,b,c Values within rows with the same superscript are not significantly different (P < 0.05)



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<b>Nutrient Digestibility</b>	<b>PC</b>	<b>NC</b>	<b>NC+300 FTU</b>	<b>P</b>
Dry Matter (%)	66.5 <sup>b</sup>	69.62 <sup>a</sup>	70.00 <sup>a</sup>	0.01
Gross Energy (%)	77.42	78.45	78.53	0.38
Nitrogen (%)	48.40	48.77	48.77	0.98
Phytate P (%)	28.24 <sup>c</sup>	48.49 <sup>b</sup>	62.80 <sup>a</sup>	0.001
Fecal P (%)	26.66 <sup>b</sup>	33.51 <sup>ab</sup>	38.24 <sup>a</sup>	0.06
Fecal Ca (%)	55.02	51.88	57.17	0.17
Tibia Ash (%)	55.69 <sup>a</sup>	53.68 <sup>b</sup>	54.71 <sup>ab</sup>	0.05

a,b,c Values within rows with the same superscript are not significantly different ( $P < 0.05$ )



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# CONCLUSIONS

- Hens fed the standard P diet (PC) performed significantly better than those fed the low P (NC) diet
- Production performance and phytate P digestibility of hens fed the NC diet can be significantly improved by ***Buttiauxella Phytase*** supplementation at 300 FTU /Kg
- *Buttiauxella* phytase supplemented at 300 FTU/kg can replace 0.18 to 0.20% avP and 0.15% Ca in corn soy based layer diet without affecting egg production performance

