



Feeding a *Buttiauxella* phytase and a 3-strain *Bacillus* direct-fed-microbial (DFM) combination improves broiler performance

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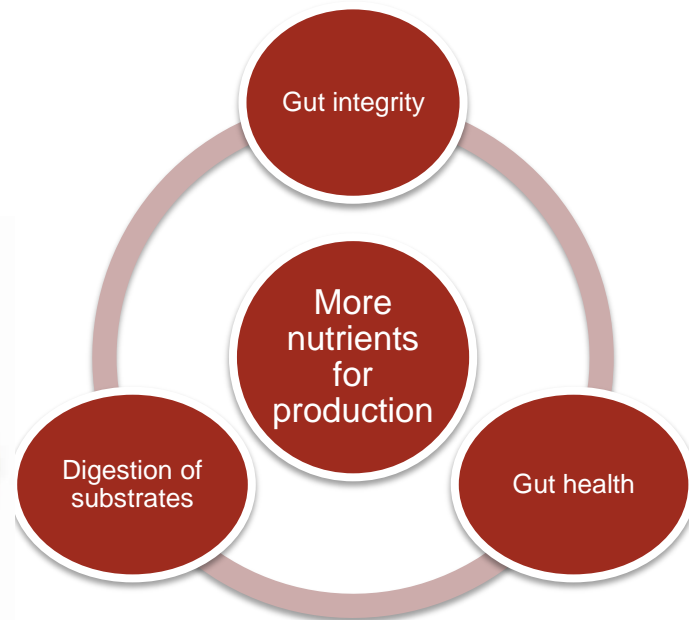
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Introduction

- It is important to optimize the growth conditions in order to get as close as possible to the performance limits of the birds – a major part of this is the diet
- Diet poses a challenge through differences in quality and the inherent variability of feed ingredients
- Diet also has a major role in interacting with the animal through the gut interface
- Enzymes can be used to deal with the variability of feed ingredients and attempt to standardize responses
- DFMs can modulate the interactions between the gut and the diet (Lee *et al.*, 2010)

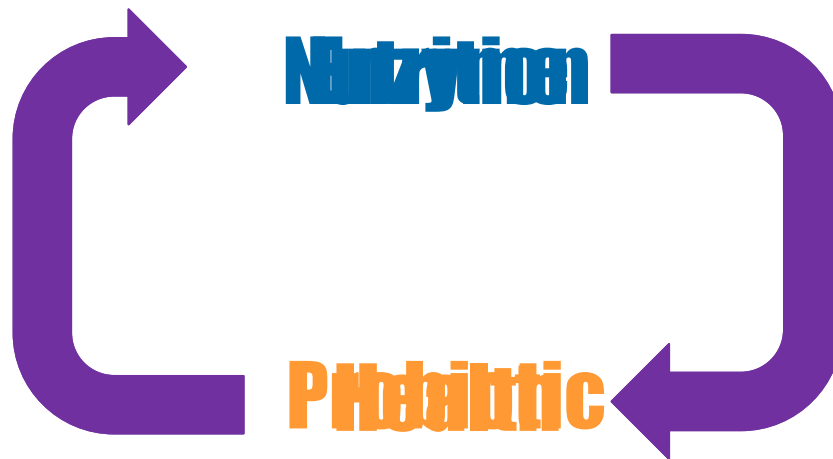
Enzymes and DFMs in poultry nutrition

The advantage of enzymes	The advantage of DFMs
Hydrolyze substrate	Live micro-organisms
Specific	Metabolism in situ
Quick	Reproduce
pH dependent	Adapt to substrates in the gut
Activity can be standardized	Help maintain healthy gut microflora



The effects of combinations

- Unbalanced gut population - poor digestibility
- Undigested nutrients – poor gut health
- Enzymes can improve gut microbial balance
- Probiotics can improve digestion



This slide will be made more scientific and have some refs etc but this captures the main points

**Is there a beneficial effect of
supplementation of a 3-
strain *Bacillus* DFM and a
Buttiauxella phytase?**

Objectives

- To investigate the effects of the combination of a 3-strain *Bacillus* DFM and different doses of *Buttiauxella* phytase
- To identify a mode of action for the observed responses



Hypothesis

- There will be a beneficial additive effect of the combination on the growth performance of the birds

Materials and Methods

- A total of 1440 one day old Ross 708 male broiler chicks
- On day 6 birds were allocated by weight to pens assigned to one of 9 treatments, each treatment was replicated 8 times
- Diets were based on corn/ SBM with corn DDGS (7%), canola meal (3%) and feather meal (3%)

Table 1 – Description of dietary treatments

1. Positive control ¹	
2. Negative control (NC) ²	6. NC + 3-strain <i>Bacillus</i> DFM
3. NC + 500 FTU Phytase ³	7. NC + 500 FTU Phytase + 3-strain <i>Bacillus</i> DFM
4. NC + 1500 FTU Phytase	8. NC + 1500 FTU Phytase + 3-strain <i>Bacillus</i> DFM
5. NC + 3000 FTU Phytase	9. NC + 3000 FTU Phytase + 3-strain <i>Bacillus</i> DFM

¹Positive control – d 7-21; Ca=0.9% and nPP=0.5%, d 21-35; Ca=0.85% and nPP=0.47%.

²Negative control – d 7-21; Ca=0.65% and nPP=0.23%, d 21-35; Ca=0.65% and nPP=0.23%

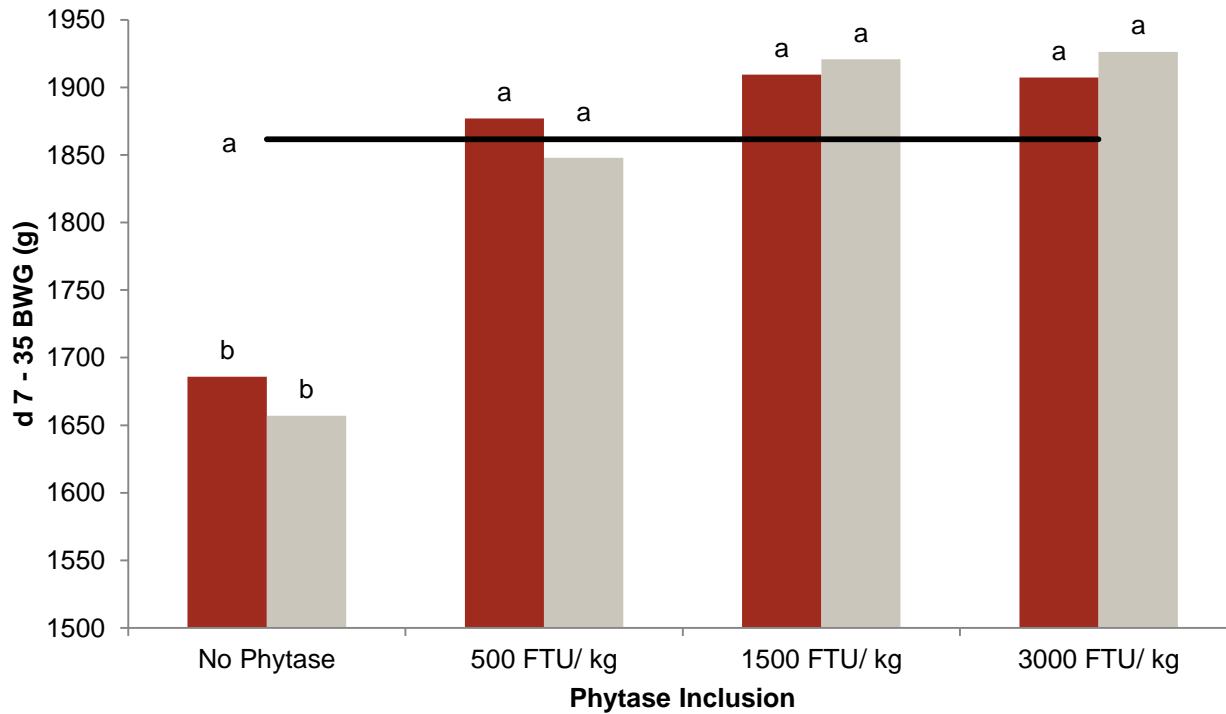
³Phytase used originated from *Buttiauxella*

Materials and Methods

- Performance parameters (FI, BWG and FCR) were recorded on days 7 and 35
- On d 35 the pH of the gizzard, duodenum, jejunum, ileum and cecum was measured following the procedure detailed in (Esmaeilipour *et al.*, 2011)
- Statistical analysis was carried out using the Fit Model platform of JMP 11.0 (SAS Institute)

Results: d 7-35 BWG

Effect test	P - value
Phytase	<0.0001
DFM	0.54
Phytase * DFM	0.32



SEM = 31.7

■ No DFM

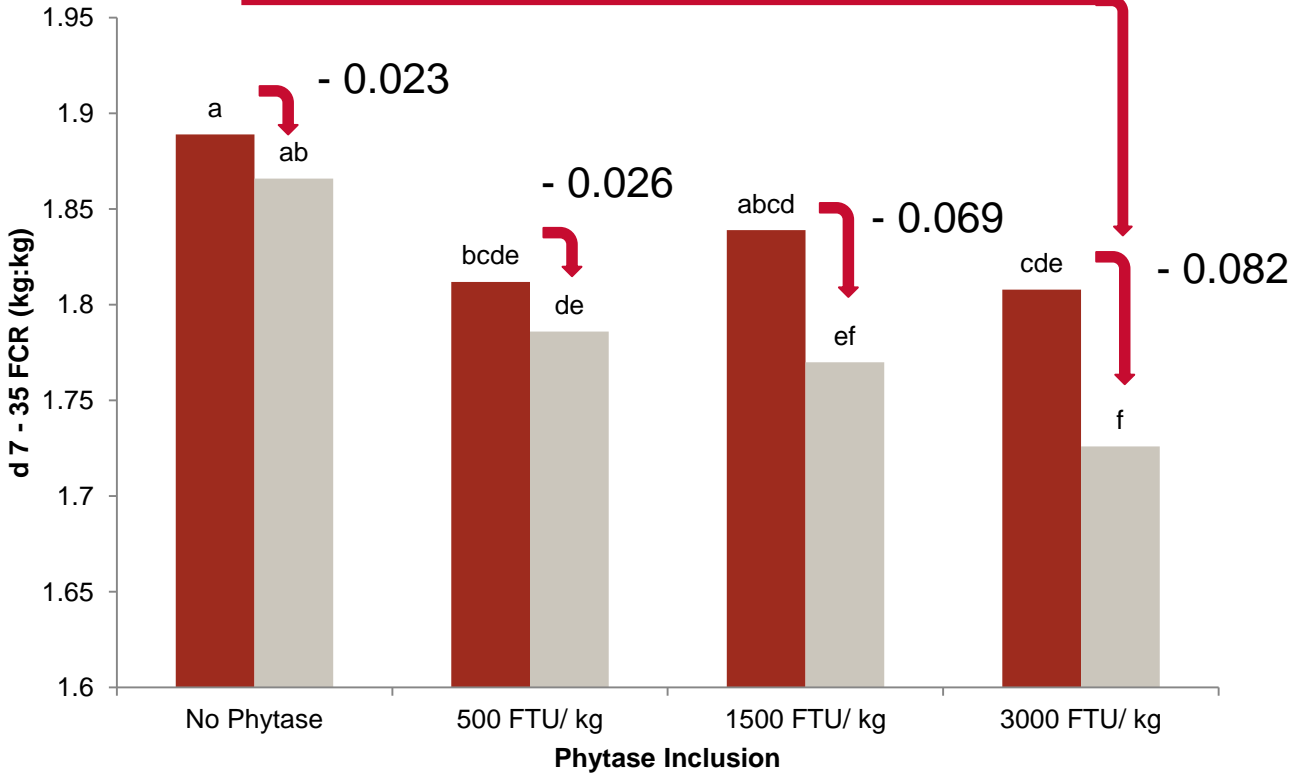
■ DFM

— Positive Control

Results: d 7-35 FCR

Effect test	P - value
Phytase	<0.0001
DFM	0.0026
Phytase * DFM	0.0759

Maximum reduction in FCR = -0.163

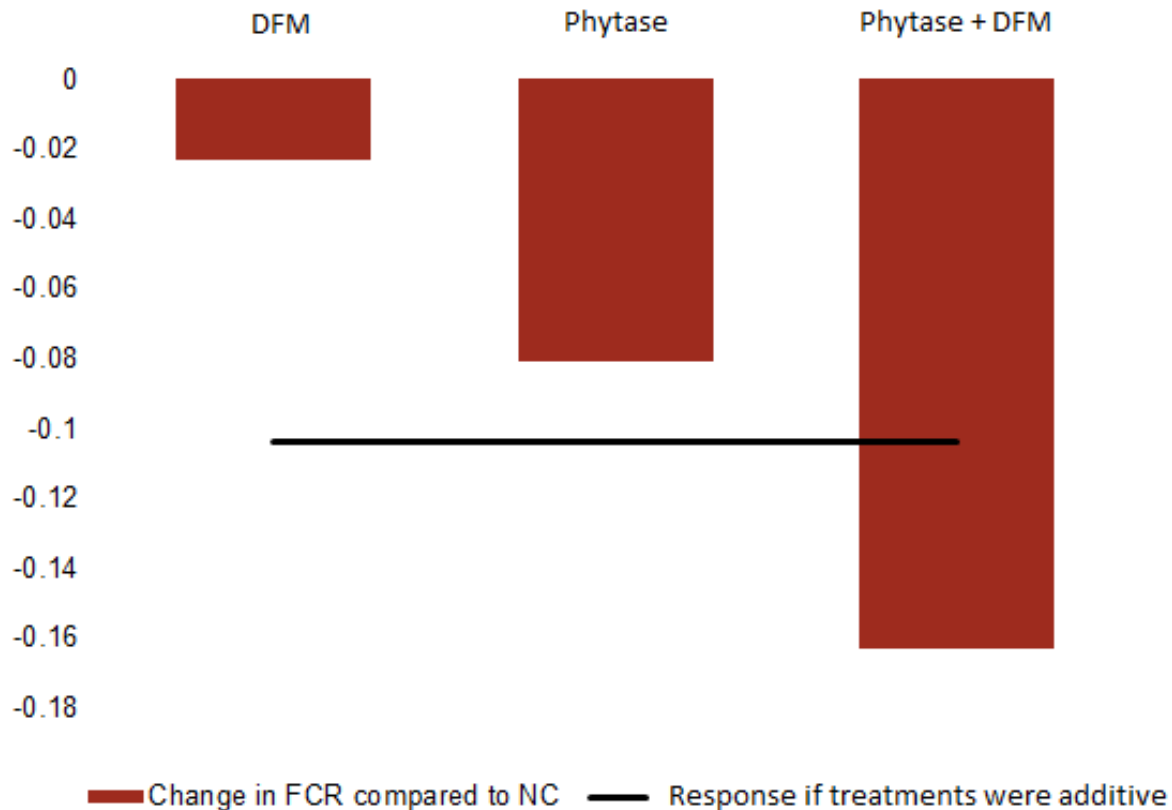


SEM = 0.02

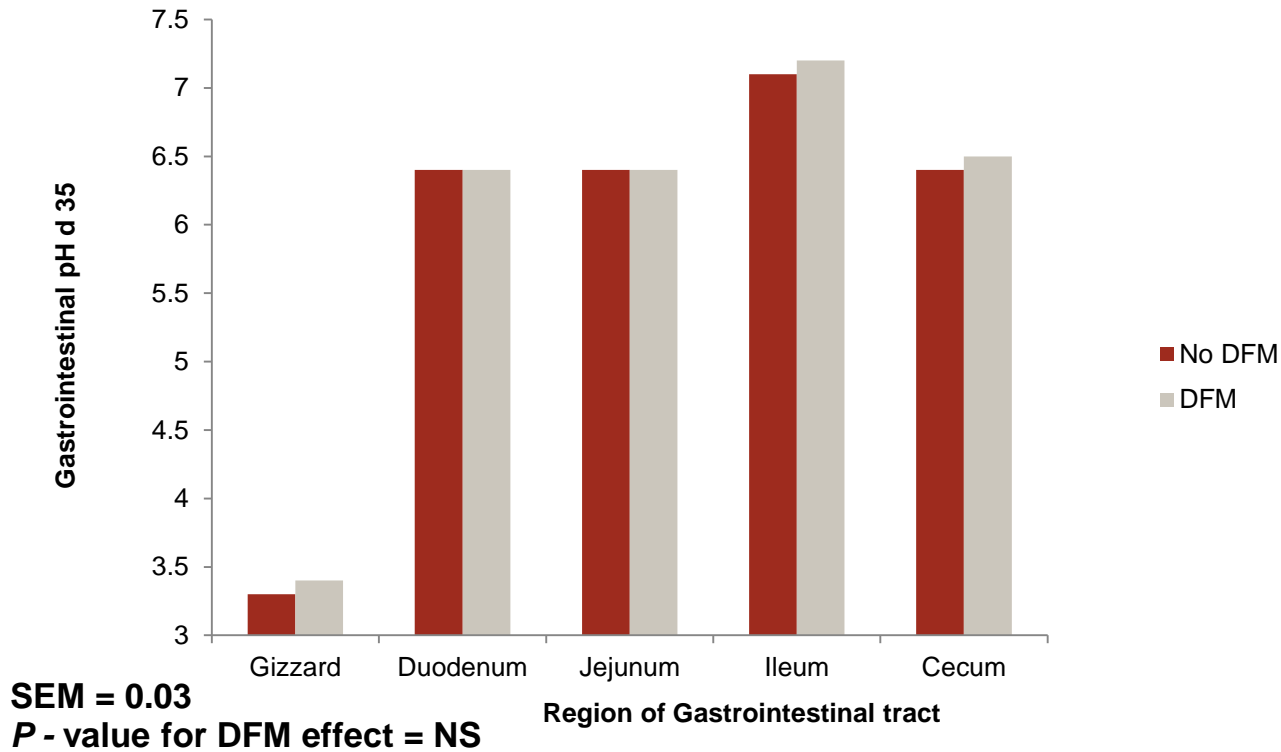
■ No DFM ■ DFM

Results: Synergy between phytase + DFM

- There is a synergy in the response in FCR improvement when the combination is added



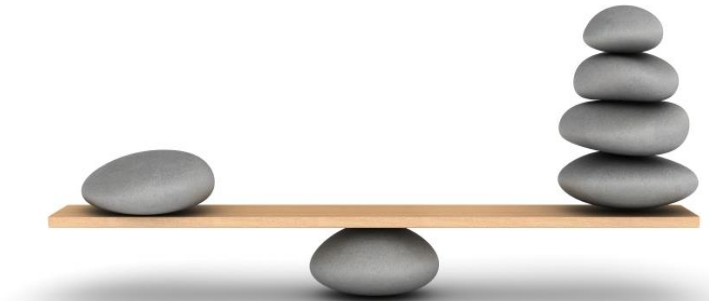
Results: Effects on gut pH



■ No significant difference in gastrointestinal pH in any of the regions measured

Conclusions

- There is a beneficial effect on bird performance, BWG and FCR, of the combination of a high dose of *Buttiauxella* phytase and this 3 – strain *Bacillus* DFM product
- Effects do not appear to be due to modulation on gastrointestinal pH
- More work is required to elucidate the mode of action for the responses observed
- Balance is key



Thank you

Questions?

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