

The effect of replacing plasma with increased levels of phytase and soy protein concentrate in a piglet diet

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Introduction

Use of plasma in piglet diets improves performance, but is expensive. Eliminating the antinutritional effect of phytate through using high doses of phytase (superdosing) has been shown to improve piglet performance. Is it possible to replace plasma with soya protein and phytase superdosing to achieve similar performance at lower feed cost? Two piglet trials were designed to test this.

Material and Methods

Experimental period: 1-14 days post-weaning

Animals: 608 piglets each trial. Piglets were weaned at 21 days, with start weights in trial 1 of 6.09 ± 0.01 kg and 6.02 ± 0.01 kg in trial 2.

Experimental design: 2 treatments, 8 replicates, 38 piglets per pen

Diets: The diets were formulated to be iso-nutrient including digestible P and calcium (0.40% and 0.9%, respectively) with no matrix attributed to the inclusion of phytase, and were fed ad libitum from 1-14 days post weaning. Phytase addition was targeted at 500 FTU/kg for the plasma containing diet (Plasma diet) and at 2000 FTU/kg for the non-plasma diet (Superdosing diet; SD).

Parameters: Average daily gain (ADG) and feed conversion ratio (FCR) per pen 0-14 days.

Statistical evaluation: Data were analysed as a simple ANOVA, using diet as the factor and differences at $P < 0.05$ were declared as significant.

Table 1: Diet Composition

	Plasma Diet	SD Diet
Extruded Maize	14	14
Extruded Wheat	14	14
Extruded Soybeans	12.25	12.25
Wheat	12.30	9.67
Barley	7	7
Whey	7	7
Maize	7	7
Lard	1.05	1.05
Dextrose	6.66	6.66
Soy protein concentrate	5.5	9.1
Fishmeal	5	6.5
Plasma	3	0
Premix	2.5	2.5
Dicalcium Phosphate	1.43	1.24
Limestone	0	0.70
Amino Acids	1.15	1.14
Salt	0.15	0.15
Quantum Blue premix	0.01	0.04
Cost (€/T)	669.09	564.37

Results and Discussion

Trial 1 showed much poorer performance than trial 2, indicating some level of challenge in this trial whilst trial 2 performance was normal for the facility. Use of the SD diet improved ADG ($P < 0.05$) in trial 1, whilst FCR was improved ($P < 0.05$) in both trials. This shows that even in poor performance conditions the use of the SD diet gave superior results than the Plasma diet.

Figure 1: ADG 0-14 days post weaning in trial 1 & 2 (a,b indicates a significant ($P < 0.05$) difference within each trial)

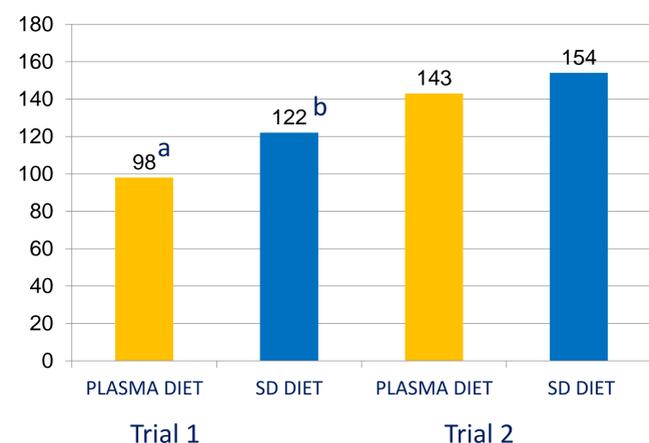
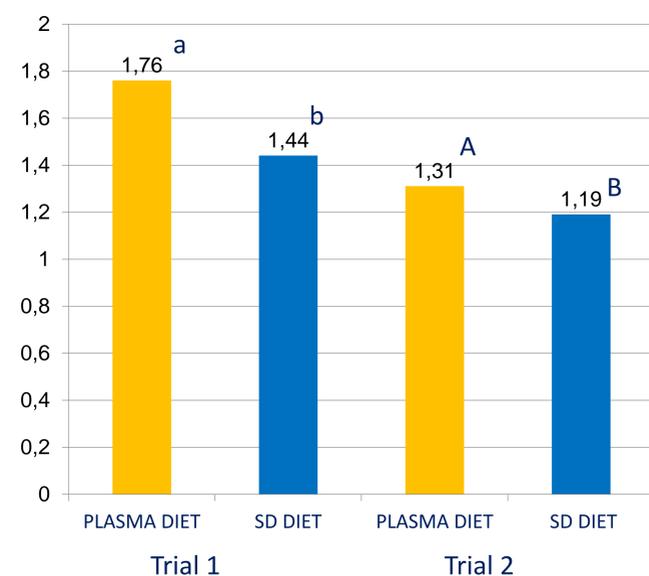


Figure 2: FCR at 14 days post weaning in trial 1 & 2 (a,b/A,B indicates a significant ($P < 0.05$) difference within each trial)



Conclusions

The use of phytase at 2000 FTU/kg on top of a non-plasma, higher soy protein concentrate diet, from wean to 14 d post-weaning resulted in equivalent or better performance than the plasma containing diet. This shows that with the use of 2000 FTU/kg phytase there is the opportunity to replace plasma with vegetable proteins typically high in phytate and maintain or improve the level of post-weaning performance.