



# GROWTH PARAMETERS OF WEANLING PIGLET FOLLOWING SUPPLEMENTATION OF PHYTASE

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## ABSTRACT

The present experiment was conducted to study the growth performances of weanling piglets following supplementation of phytase for a period of 4 months. A total of ten numbers of crossbred piglets (Hampshire X Meghalaya local), aged 60 days, maintained under standard feeding and management condition were randomly divided into two groups viz. Group A and B allocating 5 (n=5) piglets comprising 3 males and 2 females in each group. Group A was considered as control and Group B was supplemented with 500FTU of phytase. The higher BWG (P<0.01) and average daily body weight gain (ADG) were recorded in group B (50.00 ± 0.548; 0.399 ± 0.047). The better Feed Conversion Efficiency (FCE) was recorded in B (3.046 ± 0.036) than that of group A (3.498 ± 0.094).

**KEY WORD:** phytase, BWG, AWG, FCE, pig.

## INTRODUCTION:

Pig rearing is a profitable and viable occupation of weaker section of the rural society, especially among the tribal masses of India. This monogastric omnivorous species is considered as the most efficient food converter among the livestock, and therefore, they play an important role in upliftment of the socio-economic status of the weaker sections of the rural society, particularly in the North-Eastern Region (NER) of the country. Motivation of pig rearer to adopt scientific feeding and management practices, undoubtedly improve the productivity. Most of the swine feed ingredients are plant based and contain high phytic acid (Martinez, *et al.*, 2005) which hampers the bio-availability of many minerals required for various physiological processes as well as protein. The present experiment was designed to overcome the interfering effect of phytic acid on nutrient bioavailability.

## MATERIAL AND METHODS:

The experiment was conducted at ICAR Research Complex for North Eastern Hill Region, Umiam, Barapani, Meghalaya and in the Department of Veterinary Physiology, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati -781 022. A total of ten numbers of weaned piglets (10.60 ± Kg body weight; 60 days of age) randomly divided into two groups i.e. Group A and Group B comprising five animals in each group. Group A was considered as control and Group B was supplemented with 500FTU of phytase for a period of 4 months (from 2 months of age to 6 months of age) Body weights of the experimental piglets were recorded from 2 months of age at fortnightly interval till attainment of 6 months of age. The body weight gain (BWG), average body weight gain (ADG) and feed conversion efficiency (FCE) were recorded. The recorded data were statistically analyzed by using SPSS software version 11.5.

## RESULT AND DISCUSSION:

The BWG and ADG of the two groups at fortnightly interval from 2 to 6 months of age were presented in Table- 1. The initial BWG (Mean ± SE) at 2 months of age in group-A and B were recorded as 10.60 ± 0.292 and 10.60 ± 0.292, kg

respectively. The final BWG at 6 months of age were recorded as 45.00 ± 0.873 and 50.00 ± 0.548 kg for A and B groups respectively. The ADG (Mean ± SE) in A and B groups at 2.5 months of age were recorded as 0.173 ± 0.012 and 0.253 ± 0.027 kg respectively. At 6 months of age the ADG for the above treatment groups were 0.373 ± 0.026 and 0.399 ± 0.047 kg respectively. Present experiment also revealed that supplementation of phytase significantly (p<0.05) increased the BWG. Earlier workers (Shelton *et al.*, 2005; Veum *et al.*, 2006; Saikia, 2010) also demonstrated that supplemental phytase resulted in improvements of BWG and ADG. This might be due to the fact that, supplementation of phytase offers intensifying opportunity for bioavailability of minerals like phosphorus (P), calcium (Ca), magnesium (Mg), manganese (Mn), zinc (Zn), copper (Cu) and iron (Fe) from the dietary source besides protein. The main storage form of P in seed is phytate (the salt of phytic acid) which reduce the P utilization in pig. Under normal physiological condition phytate is a negatively charged ion i.e. able to bind cations like Ca, Mg, Zn, and protein (Ravindran *et al.*, 1995; Bebot-Brigaud *et al.*, 1999). Supplementation of phytase in the diet hydrolyzes the ortho-phosphate group from phytate more efficiently resulting the liberation of phytate bound nutrients and the net result is the greater bioavailability of P, Ca, Mg, Mn, Zn, Cu, Fe and dietary proteins (Kies *et al.*, 2001; and Adeola, 1995). which might have optimized the metabolic processes and accelerated the growth process, participating in various biochemical processes of the body systems.

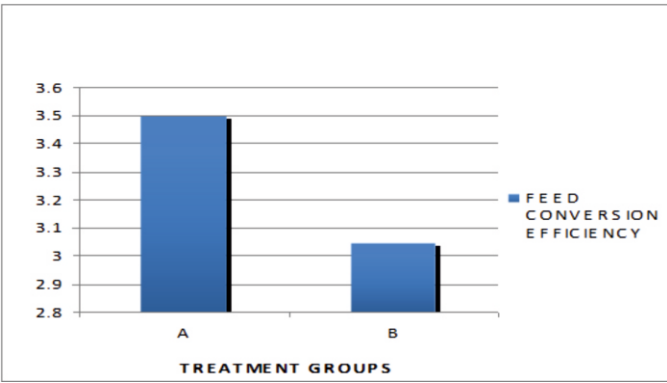
The FCE of the different treatment groups are presented in Fig. 1. The values of the FCE (Mean ± SE) were recorded as 3.498 ± 0.094 and 3.046 ± 0.036 in A and B groups respectively. Present finding is also in agreement with improved FCE when pigs were supplemented with phytase (Nery *et al.*, 2000; Shim *et al.*, 2003 and Halas *et al.*, 2009). Enhanced FCE in phytase supplemented group indicate better metabolism of the nutrient and promoting better growth.

## CONCLUSION:

From this experiment it has been concluded that, dietary supplementation of 500FTU of phytase resulted in higher BWG and ADG as well as better FCE.

**TABLE 1:- BODY WEIGHT (kg, MEAN ± SE), AVERAGE BODY WEIGHT GAIN (kg, MEAN ± SE) IN CONTROL AND PHYTASE SUPPLEMENTED GROUPS**

Parameter.	Treat. Group	Age in months								
		2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
BWG(Kg)	A	10.60 <sup>a</sup> ± 0.292	13.20 <sup>a</sup> ± 0.255	16.60 <sup>a</sup> ± 0.292	20.90 <sup>a</sup> ± 0.458	25.30 <sup>a</sup> ± 0.663	29.90 <sup>a</sup> ± 0.332	34.50 <sup>a</sup> ± 0.500	39.40 <sup>a</sup> ± 0.678	45.00 <sup>a</sup> ± 0.837
	B	10.60 <sup>a</sup> ± 0.292	14.40 <sup>b</sup> ± 0.400	18.80 <sup>b</sup> ± 0.374	23.40 <sup>b</sup> ± 0.430	28.20 <sup>b</sup> ± 0.604	33.20 <sup>b</sup> ± 0.374	38.50 <sup>b</sup> ± 0.500	44.00 <sup>b</sup> ± 0.548	50.00 <sup>b</sup> ± 0.548
ADG(Kg)	A	--	0.173 <sup>a</sup> ± 0.012	0.226 <sup>a</sup> ± 0.066	0.286 <sup>a</sup> ± 0.034	0.293 <sup>a</sup> ± 0.046	0.306 <sup>a</sup> ± 0.040	0.306 <sup>a</sup> ± 0.034	0.326 <sup>a</sup> ± 0.267	0.373 <sup>a</sup> ± 0.026
	B	--	0.253 <sup>a</sup> ± 0.027	0.293 <sup>a</sup> ± 0.034	0.306 <sup>a</sup> ± 0.024	0.319 <sup>a</sup> ± 0.030	0.332 <sup>a</sup> ± 0.018	0.353 <sup>ab</sup> ± 0.013	0.366 <sup>a</sup> ± 0.036	0.399 <sup>a</sup> ± 0.047



**Fig.1. FEED CONVERSION EFFICIENCY (MEAN ) IN CONTROL AND PHYTASE SUPPLEMENTED GROUPS FOR THE WHOLE EXPERIMENTAL PERIOD (4 MONTHS) FROM 2 TO 6 MONTHS OF AGE .**

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