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Effect of phytase supplementation in maize–soybean based feed on comparative economy for broilers production

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Abstract
A 42-days experiment with 150 one-day-old broiler chicks (Vencobb) was conducted in order to determine the effect of supplementation of phytase enzyme on comparative economics of rearing of broilers. Broilers were reared on phosphorus deficient maize-soybean based ration. A total of 150 chicks were grouped into five treatments (each treatment having two replicates) each containing 30 chicks and designated as C, T_1, T_2, T_3 and T_4. An experimental ration was formulated containing low available phosphorus (0.28%) than the normal requirement 0.45% as per BIS specifications (2007). Broiler starter and finisher ration contained 21.45 and 19.10 per cent crude protein, respectively. Energy and protein value of ration was kept equal for all treatments. Ration containing low available P was fed in control group while other treatments i.e. T_1, T_2, T_3 and T_4 were supplemented with phytase at the level of 250, 500, 750 and 1000 FTU/Kg feed, respectively. Based on comparative economics calculated in present investigation, it could be concluded that a dose of 500 FTU/Kg feed appear to be optimum level for better growth and to have profitable poultry farming by reducing feed cost.

Keywords: Broiler, economics, FTU (Phytase unit), phytase, tibia

1. Introduction
Poultry contributes to improved human nutrition and food security by being a leading source of high quality protein in form of eggs and meat. Feed represents the major cost of poultry production, constituting up to 70 percent of the total cost of rearing. Phosphorus is an essential mineral element for development and growth of poultry. Poultry rations are usually based on cereals in which 50-70 per cent of total P is present in the form of phytate (Ravindran *et al*. 1995) [1]. Ruminants are able to break phytate-P complex through phytase enzyme produced by micro-organisms present in their rumen but this P remains unavailable to mono-gastric animals due to lack of endogenous phytase. (Biehl and Baker 1997) [2]. The way to solve this problem is the incorporation of inorganic P to diets but this approach increases the cost of production and also does not solve the problem of excessive fecal P excretion causing environmental pollution. The enzyme phytase (myo-inositol-hexa-phosphate-phosphorhydrolase) catalyses the stepwise hydrolysis of inositol hexa-phosphate to inorganic phosphate and myo-inositol via InsP5 to InsP1. The phytase in small grains is inactivated by steam pelleting at temperatures above 80 °C. Hydrothermal processes, such as pelleting, expansion, and extrusion were recognized as potentially destructive for phytase (Jongbloed and Kemme, 1990) [3]. Several factors i.e. housing, chicks with good genetic make-up, fairly balanced broiler ration, prevention of infectious and nutritional deficiency disease and proper marketing affect profitable broiler production. To make broiler production beneficial, ration should be formulated not only balanced but also economical. The comparative economics in present study was calculated as cost of feed to produce one kg broiler meat. Other factors were assumed constant because all treatment groups were reared in similar conditions.

2. Materials and Methods
For the present experiment a total of One hundred and Fifty (150) one day-old, unsexed, apparently healthy broiler chicks (Vencobb) were purchased from commercial hatchery. All birds were distributed randomly and equally in five groups. Each group having 30 birds was further classified into 2 replicate each having 15 birds.

Wing bands were applied to all on 3rd day of age for proper identification. Broilers were vaccinated against Ranikhet (F_1 strain) and Infectious bursal disease at the age of 4th and 14th days respectively as per routine schedule. Diet included: C-basal diet with no supplementation; T_1 basal diet supplemented with 250 FTU/kg diet; T_2 basal diet supplemented with 500 FTU/kg diet; T_3 basal diet supplemented with 750 FTU/kg diet and T_4 basal diet supplemented with 1000 FTU/kg diet. Fresh and dry wheat straw was used as bedding material. Identical standard management practices regarding brooding, feeding, watering and disease control etc. were followed for each group during the course of study. The broiler starter and finisher feed contained 21.45% and 19.10% crude protein as tabulated in Table 1. An experimental ration was formulated containing low available phosphorus (0.28%) than the normal requirement 0.45% as per BIS specifications (BIS, 2007) [4] and offered to chicks during whole study period. Different ingredients for experimental ration were purchased from local market. The various feed ingredients used for preparation of experimental ration were purchased from the local market. The comparative economics in present study was calculated as cost of feed to produce one kg broiler meat. Other factors were assumed constant because all treatment groups were reared in similar conditions.

Table 1: Nutrient composition of experimental starter and finisher ration (% DM basis)

Ration	Dry matter	Crude protein	Crude fiber	Ether extract	Nitrogen free extract	Total ash	Available P
Starter ration	90.94	21.45	5.37	4.08	62.52	6.58	0.28
Finisher ration	90.70	19.10	4.96	4.73	64.06	7.15	0.28

3. Results and Discussion

The cost of production of one kg meat depicted in Table 2. The cost of production of one kg meat in different treatments i.e. C, T_1, T_2, T_3 and T_4 was calculated as Rs. 54.71, 48.39, 46.67, 47.86 and 47.41, respectively. Highest and lowest cost of production for one kg meat was recorded in C and T_2 groups, respectively. Comparative per cent reduction in cost of production for one kg broiler meat was recorded as 11.56, 14.70, 12.52 and 13.35 per cent in comparison with control. These results indicated that addition of phytase enzyme at different levels in broiler ration reduce the cost broiler meat production. Highest reduction in feed cost per kg broiler meat production was recorded in T_2 group (14.70%) followed by T_4, T_3 and T_1 groups.

Table 2: Comparative economics of feed per unit gain

Treatment	Starter cost/Kg	Finisher cost/Kg	Feed cost/ Kg gain	% Reduction/ Kg gain
C	25.59	25.89	54.71	0.00
T_1	25.61	25.91	48.39	11.56
T_2	25.63	25.93	46.67	14.70
T_3	25.65	25.95	47.86	12.52
T_4	25.67	25.97	47.41	13.35

4. Conclusion

Based on FCR and comparative feeding economics calculated in present investigation, it could be concluded that a dose of 500 FTU/Kg feed appear to be optimum level for better growth and to have profitable poultry farming by reducing feed cost.

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6. References

1. Ravindran V, Bryden WL, Kornegay ET. Phytates: occurrence, and implications in poultry nutrition. Poultry Avian Biol. Rev. 1995; 6:125-143.
2. Biehl RR, Baker DH. Microbial phytase improves amino acid utilization in young chicks fed diets based on soybean meal but not diets based on peanut meal. Poult. Sci. 1997; 76:355-360.
3. Jongbloed AW, Kemme PA. Effect of pelleting mixed feeds on phytase activity and apparent absorbability of phosphorus and calcium in pigs. Anim. Feed Sci. Technol. 1990; 28:233-242.
4. BIS. Indian Standard: Poultry feed specifications, 4th revision, Bureau of Indian Standards, New Delhi, 2007.