

## **Supplemental lipase and mannan oligosachcharides to improve the nutritive value of poultry by-product meal and its use as a substitute for fish meal in broiler diets**

Poultry by-product meal (PBM) produced from broiler processing waste has a potential to be used as a cheaper replacement for expensive fishmeal in broiler diets. Present study was carried out to investigate the chemical composition of PBM as affected by the composition of input material, possibility of using it as a fish meal replacer and the effect of lipase enzyme and mannan oligosachcharides (MOS) on its nutritive value. Samples of PBM produced from 15 different batches of different proportions of inputs materials were collected from a commercial rendering plant and subjected to chemical analysis. A control feed was formulated using 6% fishmeal to contain all the nutrients required by growing broilers. Two iso-caloric and iso-nitrogenous test diets were produced by including 5 and 10% PBM (of average quality) as a replacement of fishmeal. Two further test diets were produced by supplementing the 10% PBM diet with lipase (200 ppm) or a mixture of lipase and MOS (each at 200 ppm). Seventeen days old 160 broiler chicks were divided into 20 groups of 8, housed in 20 battery cages and randomly assigned to 5 dietary treatments with 4 replicates. Group feed intake and growth rate

were measured weekly. Nutrient utilization was estimated by indicator method (HCl-insoluble ash) during one collection period. Three birds from each group were slaughtered to study carcass recovery and abdominal fat deposition.

Mean composition of PBM contained  $93.8 \pm 1.02\%$  dry matter,  $57.9 \pm 1.01\%$  crude protein,  $31.1 \pm 1.27\%$  crude fat,  $8.5 \pm 0.59\%$  ash,  $0.9 \pm 0.13\%$  total phosphorus,  $4.1 \pm 0.84\%$  calcium and  $6782 \pm 30.1$  kcal/kg gross energy (on DM basis). Depending on the composition of input material, the crude protein, fat and gross energy contents of PBM varied from 51.4 to 62.5%, from 29.2 to 33.1% and from 5317 to 7892 kcal/kg (on DM), respectively. Feed intake was unaffected by the dietary treatments. PBM significantly reduced the growth rate, feed efficiency and net protein utilization (NPU) by 6 - 7%, 5 - 7% and 4 - 6%, respectively. Lipase alone had no effect on broiler performance. The mixture of lipase and MOS improved the growth rate and NPU by 2.8% and 4.5%, respectively ( $p < 0.05$ ). Carcass recovery was generally improved by MOS and lipase mixture. PBM increased the true abdominal fat deposition by 23%. Lipase and MOS reduced abdominal fat deposition by 20 - 25%. It is concluded that PBM, when supplemented with MOS, can be used to replace fishmeal in broiler diets up to 10% inclusion level.