Two studies were conducted to evaluate the effects of supplementing a microbial 6-phytase (CIBENZA® PHYTAVERSE® G10) in combination with a protease (CIBENZA® DP100) and a mannanase (CIBENZA® DE200) in broilers. Study-1 had Ross-308 male chicks, 6 treatments (Trts), 12 pens/Trt and 21 chicks/pen. Trts include reduced levels of available P (aP), amino acids (AA)/CP and energy from the +control (T6). Test diets included:T1 (-control); T1+phytase @500U/kg diet, T2; T1+protease @0.05% of diet, T3; T1+phytase @500U/kg diet + protease @0.05% of diet, T4; T3+ 0.15% aP from di-calcium phosphate, T5; industry levels of aP, AA/CP, and energy, T6 (+control). Study-2 had Cobb-500 straight-run chicks, 6 Trts under 2x3 factorial with 6 pens/Trt and 45 chicks/pen. The 2 levels of mannanase are 0 and 800u/kg diet with no matrix credit and 3 diets types are; 1) +Ctrls, 2) -Ctrls with less AA & ME than +Ctrl, and 3) -Ctrl plus 500g/MT of protease. Phytase was added across diets @1000u/kg diet with matrix values. Study-1 data was subjected to 1-way ANOVA and study-2 to 2-way ANOVA. For study-1 at d28 the gain, FCR and performance index (PI) for T1 was lower compared to T2, T4, T5, and T6 (P<0.05) but similar to T3. Phytase addition to T1 improved (P<0.05) gain, FCR and PI but the response was lower than T4 (P<0.05). When both enzymes were combined (T4) gain, FCR and PI were higher (P<0.05) than addition of either of individual enzymes (T2 or T3). Further, T4 responses were not different from +ve control (T6). At d42 only PI response was similar to d28 response. In study-2, only main effect of protease was significant (P<0.01) for both gain and FCR. The -Ctrl was not different from the +Ctrl but adding protease to –Ctrl improved gain and FCR that are different from -Ctrl (P<0.05) and comparable to +Ctrl (P>0.05).

In summary, supplementing both phytase and protease with their full nutrient values led to improved performance beyond that achieved with either enzyme supplemented separately.

Key words: Phytase, Protease, Mannanase, Broiler