Activities of amylase, trypsin and chymotrypsin of pancreas and small intestinal contents in the red jungle fowl and broiler breed

ABSTRACT

The digestive enzyme activities of the pancreas and small intestinal segments were examined in two breeds of chickens that differ in growth rate over the period of 1-day (1-d) to 4-months (120-d) of age. The total body weight (BW) of the red jungle fowl (RJF) increased slowly during the experiment, in contrast to the commercial broiler chicken (CBC) which showed markedly increase ($P < 0.05$) over the same experiment. The pancreas weight (g/100 g BW) was greater ($P < 0.05$) in the RJF during the experiment, with the exception of 1-day old group. There was significantly higher ($P < 0.05$) pancreatic enzyme activity (unit/g) and (unit/100 g) BW for the CBC, particularly at 10-days. However, there were no differences between the breeds at (20 to 56 days) for amylase and (120 days) for chymotrypsin. The enzyme activity (unit/g) for all intestinal segments increased with age. The CBC attained a maximal value on 10 days for jejunal and ileal trypsin, and duodenal, jejunal and ileal chymotrypsin. Activities (unit/100 g BW) showed decrease with age for both breeds. The CBC had a relatively greater value ($P < 0.05$) at 1 day, except for the jejunal trypsin and the chymotrypsin. Thereafter, the relative activities were higher for the RJF until the end of the experiment. Although significant differences in the digestive enzyme activities were obtained between the two breeds, these differences were generally associated with differences in body weight. The effects of selection affected the development rate of the synthesis of these enzymes according to the body requirements and biological function and this may affect the digestion and finally the growth rate.

Keyword: Body-Weight, Digestive Enzymes, Organ Development, Young Turkeys, Growth, Chickens, Lines, Responses, Selection, Trac