

Thesis Advisory Committee

S. Khajarn Chairman
(Associate Professor Dr. Sarote Khajarn)

C. Ratan
(Professor Dr. Cherdchai Ratanasethakul)

Banyat L.
(Assistant Professor Banyat Laopaiboon)

Abstract

Three experiments had been conducted to determine the effect of dietary protein and methionine levels on growth performances of cross-bred native chicken and on the apparent metabolizable energy values of diets in native chicken and cross-bred native chicken from 0 to 16 weeks of age.

Experiment 1., six hundred and forty day-old Sri-chum-pol (S.C.P.) cross-bred chicks were allotted at random in a completely randomized experiment with 4 replications and 4 treatments. The diets for 0 to 4 weeks of age in treatments 1, 2, 3 and 4 were cereal-soybean meal based diets containing 20, 20, 18 and 18 % protein, respectively. From 5 to 16 weeks of age, the split-plot in completely randomized design with 4 replications was used. Main plots were sexes (male and female) and sub plots were 4 patterns of dietary protein levels (20-18, 20-16, 18-16 and 18-14%)

applied to two growing phases, 5-6 and 7-16 weeks of age. It was found, during 0-6 weeks of age, the reduction of dietary protein (20 VS 18 %) significantly reduced ($P < .01$) body weight (807.24 VS 730.67 g/bird), weight gain (770.91 VS 694.88 g/bird), protein intake (366.54 VS 313.75 g/bird) and feed costs (11.42 VS 10.60 baht/bird, $P < .05$), but it increased ($P < .01$) feed/gain (F/G, 2.38 VS 2.51) and protein efficiency ratio (PER, 2.10 VS 2.21). However, there was no significant effect ($P > .05$) on feed intake (1,832.74 VS 1,743.11 g/bird). During 7 to 16 weeks, there were no interactions between sex and dietary protein levels ($P > .05$) on body weight, weight gain, feed intake, F/G, protein intake, PER and feed cost of cross-bred chicken. Decreasing dietary protein levels (20-18 VS 18-14 %) significantly reduced ($P < .01$) body weight (2,638.78 VS 2,340.12 g/bird), weight gain (1,831.74 VS 1,609.05 g/bird), feed intake (8,352.49 VS 7,660.35 g/bird), protein intake (1,503.45 VS 1,072.45 g/bird) and feed cost per kilogram of weight gain (25.87 VS 23.10) but increased ($P < .01$) PER (1.20 VS 1.48) of S.C.P. cross-bred chicken. There was no significant effect ($P > .05$) on F/G (4.56 VS 4.76). The males performed significantly better ($P < .01$) than females in terms of body weight (2,569.29 VS 2,084.24 g/bird), weight gain (1,795.10 VS 1,387.03 g/bird), feed intake (8,456.18 VS 6,895.80 g/bird), F/G (4.71 VS 4.98), protein intake (1,183.87 VS 965.41 g/bird), PER (1.52 VS 1.44), feed cost per bird (40.42 VS 32.96 baht) and feed cost per kilogram of weight gain (22.53 VS 23.29 baht).

Experiment 2., six hundred and forty day-old chicks were allotted at random in a randomized complete block experiment with

4 replications and 4 treatments. From 0-4 weeks of age, a 18 % CP diets in treatments 1, 2, 3 and 4 were supplemented to contain methionine at 0.30, 0.33, 0.36 and 0.39% by weight, respectively. From 5 to 16 weeks of age, the design was shifted to split-plot randomized complete block experiment with 4 replications. Main plots were male and female and sub plots were 4 patterns of dietary methionine levels (0.30-0.24, 0.33-0.27, 0.36-0.30 and 0.39-0.33 %) applied to two growing phases, 5-6 and 7-16 weeks of age, respectively. It was found, during 0 to 6 weeks that the increasing of dietary methionine levels from 0.30 to 0.39 % linearly increased ($P < .05$) F/G and PER but did not significantly effect ($P > .05$) body weight, weight gain, feed intake, protein intake or feed cost per bird of cross-bred native chicken. During 7 to 16 weeks, there were no interactions between sex and dietary methionine levels ($P > .05$) on body weight, weight gain, feed intake, F/G, protein intake, PER and feed cost. Increasing dietary methionine levels from 0.30-0.24 to 0.39-0.33 % linearly improved ($P < .05$) F/G and quadratically improved ($P < .05$) both PER and feed cost per kilogram of weight gain, but did not significantly affect ($P > .05$) body weight, weight gain, feed intake, protein intake or feed cost per bird. The male chicken performed better than females ($P < .01$) in terms of body weight (1,673.31 VS 1,295.89 g/bird), weight gain (1,188.23 VS 876.98 g/bird), feed intake (5,232.22 VS 4,235.04 g/bird), F/G (4.41 VS 4.83), protein intake (726.75 VS 588.25 g/bird), PER (1.64 VS 1.49), feed cost per bird (26.06 VS 21.19 baht) and feed cost per kilogram of weight gain (21.94 VS 24.05 baht).

Experiment 3, forty native chicks(20 males,20 females) and forty cross-bred native chicks (20 males, 20 females) were allotted at random in 2x2 factorial in randomized complete block balance trials with 4 replications. Factor 1 was sex and another factor was breed, i.e. native chicken or crosss-bred native chicken. The balance trials were conducted in the periods from 5 to 6 weeks and 15 to 16 weeks of age. The diets for each period contained 18 and 14 % protein without methionine supplementation, respectively. It was found that there were no sex x breed interaction($P>.05$) on dry matter of excreta, digestibility of dry matter, nitrogen intake, nitrogen in excreta,nitrogen retention, apparent metabolizable energy (AME) and nitrogen corrected apparent metabolizable energy(AME_n) values of feed. In the period of 5 to 6 weeks, there were no significant breed effects($P>.05$) on dry matter of excreta(11.22 VS 11.19 g/d), digestibility of dry matter(61.88 VS 61.13 %), nitrogen intake(0.95 VS 0.93 g/d), nitrogen in excreta(0.51 VS 0.52 g/d), nitrogen retention(0.44 VS 0.41 g/d), AME(2,793 VS 2,768 Kcal/kg) and AME_n of feed(2,686 VS 2,667 Kcal/kg). With respect to sexes, the males had higher($P<.05$) nitrogen intake(0.97 VS 0.89 g/d) and nitrogen retention(0.42 VS 0.39 g/d) than the females. In the period from 15 to 16 weeks, native chicken had higher($P<.05$) dry matter of excreta(21.10 VS 19.83 g/d) and lower($P<.05$) digestibility of dry matter(66.50 VS 68.50 %) than cross-bred chicken. Also no significant breed effects($P>.05$) on nitrogen intake(1.61 VS 1.61 g/d), nitrogen in excreta(1.00 VS 0.95 g/d), nitrogen retention(0.61 VS 0.66 g/d), AME(2,939 VS 2,977 Kcal/kg) and AME_n of feed(2,869 VS 2,901 Kcal/

kg) were observed. The male had higher ($P < .05$) dry matter of excreta (22.16 VS 17.51 g/d), nitrogen intake (1.85 VS 1.34 g/d), nitrogen in excreta (1.07 VS 0.82 g/d) and nitrogen retention (0.77 VS 0.55 g/d) than the female chicken. However, there were no significant breed effects ($P > .05$) on digestibility of dry matter (69.40 VS 67.15 %), AME (2,993 VS 2,961 Kcal/kg) and AME_n of feed (2,915 VS 2,887 Kcal/kg).