Research and Development of Pheasant and Bresse Chickens on Highland Area

Abstract

Research and development of Pheasant and Bresse chickens on highland area aimed to lift up the production performance approaching to the standard in order to produce good quality products as well as to introduce alternative economic animals for highland farmers. Four experiments were conducted.

Exp. 1: Investigation on production and reproduction performanceห of F_3 pheasant and Bresse chicken. The F_3 growing birds which were the offspring of line crossing in F_2 generation were selected for breed- true characters and used as experimental animals. A total of 72 ring neck pheasant composed of 12 male and 60 female birds (1:5) were allotted into 4 lines (according to the mating program between male and female lines in F2 generation). Each line had 3 replicates. In the case of Bresse chicken, a total of 144 heads, composed of 24 male and 120 female birds (1:5) were used.

The production performance of pheasant at 16 weeks of age on body weight, FCR, shank length and breast width showed no significant difference among lines ($P>0.05$). However It was found that Line 1-2 (the offspring of F_2 male in Line 1 crossed with F_2 female in Line 2) had the highest feed consumption as compared to the rest (31.13 vs. 30.07-30.12 g/d; $P<0.05$). At 32 weeks of age, the difference among lines on body weight, feed intake, FCR, shank length and breast width of both sexes were not significant. However, shank length of female bird in Line 2-1 was significantly higher than Line 4-3, while Line 1-2, 2-1 and 3-4 were not significantly different. At 39 and 53 weeks of age no significant difference was found on all parameters of production performance.

According to egg production performance, Line 1-2 and 4-3 laid first egg at 174 and 178 days of age which was earlier than the other lines ($P<0.05$). Line 4-3 gave highest egg production (66.19%; $P<0.05$). Body weight (BW) at the onset of egg production, feed intake and feed used per kg or per dozen egg were not significant different among lines. Line 2-1 had higher fertility rate and lower embryonic death eggs than other lines, thus resulted on higher hatchability rate ($P<0.05$; 53.63 vs. 44.85-52.39% of fertile eggs)

In Bresse chicken, the result of F_3 generation at 18 weeks of age were not different among lines of both sexes on BW, shank length and breast width ($P>0.05$). However feed intake of Line 4-3 was significantly higher than Line 1-2. At 26 and 53 weeks of age, no significant difference was found only on BW of both sexes. According to egg production performance, Line 1-2, 3-4 and 4-3 laid first egg earlier than Line 2-1 (at 145, 145, and 143 vs. 148 day of age; $P<0.05$). In addition, when different generation was compared, it was found that the average first laying age, body weight at the onset of laying and weight of first egg in F_3 generation was better than F_1.

Reproduction performance, no significant different among lines was found on percentage of hatching eggs and fertilized egg. The average values of 4 lines were 97.16 and 93.34%, respectively. Hatchability, fertility and embryonic death including death in shell egg rate were not significant different among lines. The comparison between generations revealed that F_3 had better percentage of fertilized egg and hatching egg than F_2.

Exp. 2: Production performance of F_4 pheasant birds which were sent to 3 highland farmers at 3 elevation levels i.e. below 800, 800- 1,000 higher than 1,000 m above sea level was investigated. The birds were raised from 3-12 weeks of age according to PRF-GAP: Pheasant Highland Farm guideline. It was found that at 6 weeks of age no significant different among locations was observed on all production performances. The exception was noticed on feed intake at 800-1,000 m which was lower than the other elevations ($P<0.05$; 993.77 vs. 1134.95 -1075.55 g/d). However body weight was the highest, thus caused better FCR and FCG of throughout the experiment (2.60 vs. 2.73-2.73 and 37.69 vs. 39.60-39.61 B/ kg BW gain, $P>0.05$). When production performance of pheasant between years was compared, it was found that BW of both years were similar, but FCR of year 2017 was higher than 2016, thus caused slightly higher FCG (37.46 vs. 36.11 B/kg BW gain). The satisfactory evaluation from 6 farmers on performance and production of birds showed high – very high score. They also expressed high satisfaction on farm improvement for RPF-GAP: Pheasant Highland Farm, even though it caused higher expense and labor for improving.

Exp. 3 was divided into 2 sub-experiments i.e. the studies in pheasant and in Bresse chicken. A total of 120 heads of one-day old pheasant chicks were allotted into 4 groups, each with 3 replicates of 10 chicks/rep. They were fed with diets containing different CP and ME levels. Group 1 was fed with high CP and high ME diet, i.e. 25% CP, 3.2 kcal ME/g during 1-6 weeks of age and 22% CP, 3.2 kcal ME/g during 7-12 weeks of age. Group 2 was fed with high CP but low ME, i.e. 25% CP, 2.9 kcal ME/g during 1-6 weeks of age and 22% CP, 2.9 kcal ME/g during 7-12 weeks of age. Group 3 was fed

with low CP but high ME, i.e. 23% CP, 3.2 kcal ME/g during 1-6 weeks of age and 20% CP, 3.2 kcal ME/g during 7-12 weeks of age. Group 4 was fed with low CP and low ME, i.e. 23% CP, 2.9 kcal ME/g during 1-6 weeks of age and 20% CP, 2.9 kcal ME/g during 7-12 weeks of age. The result found significant interaction between CP and ME levels on production performances during 1-12 weeks of age. When each factor was taken into consideration, it was found that different level of CP and ME had significant effect on production performance (FI, FCR and FCG). The optimum diet for ring-neck pheasant during 1-6 weeks of age should contain 23% CP, 3.2 kcal ME/g, while during 7-12 weeks of age should contain 20% CP, 2.9 kcal ME/g.

In the case of Bresse chicken, it was divided into 2 groups. Group 1 was fed with control diet containing 19% CP, 2.9 kcal ME/g, 17% CP, 2.9 kcal ME/g and 15% CP, 2.9 kcal ME/g during 1-5, 6-10 and 11-13 weeks of bird age, respectively. Group 2 was fed with control diet (as Group 1) but supplemented with free choice corn silage. The birds were raised at 3 different elevation areas, i.e. below 800, 800- 1,000 and higher than 1,000 m above sea level. Each area composed of 2 farms. There was no significant different on production performance during 3-5, 6-10 and 11-13 weeks of bird age (P>0.05). However, Group 1 which was fed only control diet tended to have better performances than the corn silage supplemented group (BWG 1.57 vs. 1.37 kg.; FCR 2.27 vs. 2.61; FCG 22.95 vs. 27.23 B/kg BW gain).

Exp. 4: A total of 180 heads of Bresse chicken were allotted into 6 groups, each with 3 replicates of 10 birds. They were castrated with either old or new castrating equipment at 4, 6 and 8 weeks of age according to Randomized Complete Block Design. The result revealed that the new equipment (which had magnify lens, micro suction tube, and small hook to remove testis) was superior to the old one. It was able to castrate the birds at a younger age than the old one (4 vs. 8 weeks old). In addition it required less castration time (2.72 min/ bird) and small castration area (11.97 mm) with less mortality rate. It also gave significantly better success castration rate than the old equipment (92.22% vs 58.89%). Bresse chicken at 16 weeks of age being castrated with new type of equipment at 4 weeks of age had satisfied ADG with better FCR while required less feed than the other groups. The level of testosterone hormone at 12 weeks of bird age in non- castrated chick was more than castrated chick and female chick (0.750 vs. 0.040 and 0.031 ng/ ml blood), respectively.