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Potency of Local Duck in West Sumatera for Food Security

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ABSTRACT

The aims of this research are to determine potency from three population local duck in West Sumatera (Pitalah, Kamang and Bayang), which have precious values as genetic resources that can be used for food security. Each population used 100 ducks, all data analysis by SPSS. Pitalah 12 weeks old body weight were highest, and Bayang lowest, same with FCR. Percentage Pitalah duck egg production was highest, followed by Bayang and Kamang, as well as the FCR layer period to. But, the average weight of eggs Bayang duck the highest, followed by Pitalah and Kamang. Haugh Unit value of eggs Pitalah also higher than the other two types of ducks. This experiment suggest that Pitalah duck have potential both for broiler and layer, but Bayang duck were better for layer and Kamang just for broiler, this potency plays an important role for increased productivity local duck and food security.

KEYWORDS : potency; west sumatera duck; food security

INTRODUCTION

Local breeds make up most of the world's poultry genetic diversity, and are still very important in developing countries where they represent up to 95 percent of the total poultry population. These local breeds, which are well-adapted to extensive husbandry systems and suitable for resources-poor poultry farmers endowed with very limited means, should be thoroughly studied as a basis for enhancing their use and conservation (Besbes, *et al*. 2007). These figure clearly indicated that local or indigenous breeds make up most of the world's poultry genetic diversity (Rischkowsky and Piliang, 2007).

Indonesia has been known as one of mega biodiversity countries in the world. However, some of the plant and animal populations have been decreasing in the last decades likes West Sumatera Local duck, namely Pitalah, Kamang and Bayang. They are originated and distributed in West Sumatera Indonesia. Pitalah and Kamang duck represents ones of the Indonesia fauna species which has started to decrease and undoubty will extinct, despite the glorifying efforts. The concervation and management practices of this species could be improved through a better understanding of the potency and genetic diversity of them.

Demand for animal protein is increasing and duck production may be able to help meet this demand. As ducks are able to adapt to a wide range of environmental conditions the importance and popularity of duck industry is increasing. Ducks have a remarkably rapid growth during the first week of life. Potency of animal can shown on their development and growth, which are closely associated processes. The first dominates during embryogenesis and the second in the postnatal period of life (Hyankova *et al*. 2004). Broiler growth has consistently been the prime selection trait, because of its easy of selection, high heritability and large impact on total meat production cost (Arthur and Albers, 2003).

The optimum egg production in laying periods can determined by its growth, specially in stater period , since hatching ducks (DOD) until 8 weeks of age (Susanti and Prasetyo, 2007).

MATERIALS AND METHODS

Three hundred ducks were randomly chosen from three duck populations in West Sumatera (100 ducks of each population): Pitalah, Kamang and Bayang. All duck were reared since DOD (Day old Duck), and weighing to got body weight and FCR of 8 and 12 weeks age. Each population also measured egg production and quality as follow : 1) egg production precentage for 20 weeks; 2) FCR layer period for 20 weeks; 3) weight of eggs after 70% production ; 4) Haugh Unit value of eggs; and 5) yolk index. All duck gave iso calory and protein of diet from growth periods and laying periods (Table 1). All data from variables were calculated by *z-test* for analysis significantly between population. Egg quality analysis was performed weekly by using 150 eggs from each population when duck 12 month age, and the quality parameters were calculated by following formulas (Stadelman and Cotterill, 1995):

Haugh Unit = $100\log(H+7{,}57-1{,}7W^{0{,}37})$, H: albumin height (mm), W: egg weight (g).

Yolk Index = yolk height (mm) : yolk diameter (mm)

RESULTS

Duck growth up to 12 weeks of age among three population were almost increase. This study resulted that Pitalah duck almost have highest body weight for 8 and 12 weeks of age, and than follow by Kamang and Bayang (Table 2). Body weight of 8 weeks age, the highest remain from Pitalah duck (1084.03), but the weight of Kamang (1067.82) higher than Bayang (1033.67). While the weight of the 12 weeks old, ducks Pitalah regained the lead with the highest weight (1315.12) than Kamang (1304.02) and Bayang (1254.30).

The result of *Z test* from three population, that body weight Pitalah duck significantly ($P<0{,}05$) highest, from 8 until 12 weeks of age. All local duck have potency for broiler but Pitalah or Kamang were better, because between Pitalah and Kamang almost not significant neither, than Bayang. Feed Consumption Ratio (FCR) obtained from the amount consumed that given period divided by body weight gain, its illustrates that the lowest FCR value more efficient in using their diet. Table 2 represented that Pitalah duck almost have the lowest FCR and Bayang the highest. The result of *z Test* of FCR showed that Pitalah duck not significantly better than Kamang, but significant with Bayang, neither for 8 weeks old or 12 weeks old.

Three population local duck were significantly ($P<0{,}05$) for daily egg production (Table 3), Pitalah duck the highest (60,80) follow of Bayang (53,35) and Kamang the lowest (40,28). Daily egg production was measured for 20 weeks since the first egg was produced. Feed consumption ratio (FCR) average layer period for 20 weeks produced, showed that Pitalah duck (5,44) most efficient for using the diet, followed by Bayang (5,90) and Kamang (9,01). This showed Pitalah duck better than Bayang especially Kamang. FCR Pitalah duck highly significantly ($P<0{,}01$) lower than Kamang duck, but not significant with

Bayang duck (P>0,05). Egg quality can be described by egg weight, yolk index and Haugh Unit. Eggs weight three population local duck not significant (P>0,05) between Pitalah and Bayang, its same between Pitalah and Kamang (P>0,05) but highly significantly (P<0,01) between Kamang and Bayang. HU value of Pitalah eggs also higher than the other two types of ducks, Bayang and Kamang, while the index of yolk duck Kamang more higher than Pitalah and Bayang.

DISCUSSION

Duck growth up to 12 weeks age among three population were highly significant (P<0,05), and increase, its similar with Setioko *et al.* (2005) that the maximum growth of duck at the age of 4-10 weeks and than decreased. In the other hand Brahmantiyo *et al.* (2003) reported that the increased growth of duck namely Pegagan only until 9 weeks of age, and than decreased. The value of FCR better than Randa *et al.* (2007) reported, that conversion Alabio ducks for 10 weeks old is at 8.8 or lower than the 8.92 Cihateup duck. FCR layer period Pitalah duck the lowest among three population local duck, its mean Pitalah duck have big potency for layer.

Three population local duck were significantly (P<0,05) for daily egg production. It can be caused by phenotypic diversity as a result of their genetic diversity, the diversity of environmental and genetic interactions with the environmen. In this study , the diversity of environments assumed to be equal, so that the diversity that occurs is a diversity caused by genetic factors. Genetic diversity is caused by additive gene action and nonaditif consisting of dominant genes and gene epistasis . The average height difference which indicates the value of heterosis , then allegedly duck egg production is affected by additive gene action (Noor, 2010).

Table 3 showed Bayang duck have greater eggs weight than Pitalah, and Kamang also, but the average daily egg production Bayang duck lower than Pitalah , and this has resulted in the average feed conversion Pitalah ducks and Bayang not significantly different. Frankham *et al.* (2002) said that genetic diversity that appears in the form of sequence differences in the sequence of bases then generate a sequence of different amino acids in a protein encoded by a locus . Variations of these proteins in turn cause biochemical or morphological differences in function , which eventually will lead to differences in the rate of reproduction, survival , or the behavior of individual.

CONCLUSION

This experiment suggest that Pitalah duck have potential both for broiler and layer, but Bayang duck were better for layer and Kamang just for broiler, this potency plays an important role for increased productivity local duck and food security.

Table 1. The composition and nutrient content of diet in growth and laying period

Feedstuffs	Formulation growth periods (%)	Formulation laying periods (%)
Concentrate 144	25,00	32,00
Kale vegetable	2,00	2,60
Rice bran	30,00	25,00
Cornstarch	43,00	40,00
Mineral	0,00	0,40
Total (%)	100,00	100,00
Nutrient content		
Crude Protein (%)	15,46	17,08
Crude lipid (%)	3,09	3,09
Crude Fiber (%)	8,16	7,78
Ca (%)	3,49	4,69
P (%)	1,78	2,17
ME (Kkal/Kg)	2609,20	2610,16

Table 2. Average body weight and FCR growing period .

Duck	0 – 8 weeks		0 – 12 weeks	
	Body weight	FCR	Body weight	FCR
Pitalah	1084,03[a]	2,57[a]	1067,82[a]	2,56[a]
Kamang	1315,12[a]	7,04[a]	1304,02[a]	7,10[a]
Bayang	1033,67[b]	2,67[b]	1254,30[b]	7,42[b]

Table 3. Average egg production and quality.

Variable	Population		
	Pitalah	Kamang	Bayang
Daily egg production (%)	60,80[a] ±16,88	40,28[b] ±13,23	53,35[c] ±8,09
FCR laying period	5,44[b] ± 2,61	9,01[a] ± 3,10	5,90[b]± 2,27
Egg weight (g)	68,10[ab] ± 4,67	67,67[b] ± 2,18	68,84[a] ± 5,18
Yolk index	0,44[a] ± 0,02	0,45[b] ± 0,03	0,44[a] ± 0,02
Egg Haugh Unit	96,91[a] ± 8,55	93,11[b] ± 6,84	94,67[ab] ± 8,59

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