Exterior characteristics of *Kejobong* goats kept by farmers

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ABSTRACT: Indonesia has various animals owning characteristic genetic properties and germ plasm. Kejobong goats is one of germ plasm owned by Indonesia, however their characteristic and productivity has not been explored, therefore, this research was conducted to identify farmers background and exterior characteristic of Kejobong goats kept by farmers at Kedarpan village, Kejobong, Banjarnegara. The materials were 45 Kejobong goats' farmers and 185 head of male and female Kejobong goats at various ages, starting from one month old up to more than three years old. Structured questionnaire were used to interview farmers background. The data consisted of farmers' background and exterior characteristics of Kejobong goats, it was heart girth, body length, shoulder height and ear length. The data was tabulated and analyzed using one way analysis of variance. Results indicated that Kejobong goats were kept by old farmers (48.3 years old) with low educational background (76.2% were basic school) and less involvement of family members on keeping goats (1.8 head per family). On average, the numbers of goats kept by farmers was 4.1 head (2-8 head) with the main objective was saving (85.7%) and goats were kept for breeding purposes (90.5%). The exterior characterstics of Kejobong goats indicated that young female goats (1 to 12 months old) have better characteristics than male goats, while adult (more than one year olds) male goats have better charactersitics than female. Heart girth, body length, shoulder height and ear length of 1-3 months old of female goats were 43.2; 38.8; 42.2 and 17.8 cm, respectively, while for male goats were 43.2; 37.2; 41.8 and 16.8 cm. Exterior characteristics of female Kejobong goats under one year old were 68.6; 54.8; 62.7 and 18.5 cm for heart girth, body length, shoulder height and ear length, respectively, while for male goats were 68.3; 57.0; 62.0 and 19.5 cm. Heart girth, body length, shoulder height and ear length of 36 months old of female goats were 75.5; 61.0; 67.2 and 22.0 cm, while for male goats were 72.0; 61.5; 68.0 and 23.0 cm, respectively. It is concluded that Kejobong goats were kept by old farmers with low educational background, small numbers owned and traditional management. Young female Kejobong goats have better exterior characteristics than those of male, in contrast with the adult.

Key words: exterior characteristics, Kejobong goats, farmers

INTRODUCTION

Indonesia has an abundance and potential asset of animal genetic resources and germ plasm that can be used to develop new animal breeds. The potency and diversity of animal germ plasm in Indonesia is a superior asset which can be promoted and developed, it is also neccessary to explore and to develop through international cooperation/networking and research collaboration. Different varieties of local animal breeds which are loccally specific, either well known local breed of animal or not, can be found in each province with unknown number of population and potency. Those breeds have comparative superiority over imported breeds, for example they are better adapted to the harsh tropical environment, good reproduction performances as a result of natural selection.

Goats are closely linked with the poorest people in rural areas and the number of goats they keep is generally small, kept under traditional ways and for multipurpose objectives, as live savings, sources of animal protein, utilization of spare land around farmers' houses and manure resources to fertilize their crops (Budisatria, 2006), have socio-economic relevance and socio-culture roles (Devendra 1992). The lack of attention given to small ruminants is the cause of the

stagnant development and consuntly the annual population does not increase significantly. Goats are kept under traditional method and the majority of farmers keep goats as secondary activity, although some of them keep them for their main cash income.

One of goat breed that recently have been given attention is Kejobong goat. This type of goat originally kept by farmers in Purbalingga district, Central Java. The special characteristic of Kejobong goat is purely black in hair colour, hanging ears and semi concave face. The history of Kejobong goat is unclear, however, some researchers stated that Kejobong goats was produced from the crossing of local goats and Etawah Grade goats and selected for pure black colour, therefore Kejobong goats has uniform colour, namely black (Astuti et al., 2007; Budisatria et al., 2009).

The superiority of local animal germ plasms has not been explored, in one side, their conservation and utilization remains just on paper, on the one hand, threats of erosion and pollution of germ plasms occur on the other. This condition worries us because it may result in the extinction of some germ plasms (Astuti et al., 2007). Therefore, conservation, development and utilization of animal germ plasms must be supported by the rule and methods so that the potency of indigenous animal genes or local animals and their genetic relationship can be protected, either for the animal has been recently developed or still kept under sub-system.

As the initial step to support animal germ plasm conservation in Indonesia, therefore this research was conducted to explore the exterior characteristics of Kejobong goats kept by farmers at Kedarpan village, Kejobong, Central Java.

MATERIALS AND METHODS

The research was conducted for five months, starting from June to October 2009, located at Kedarpan village, Kejobong, Purbalingga, Central Java. In total, the research was involved 45 Kejobong goats farmers and 162 head of male and female Kejobong goats at various ages, it consisted of 30 pre weaning goats (0-3 months old), 42 heads of post weaning goat (6 months old), 60 heads of 12-18 months old of male and female Kejobong and 30 head of goats under 24 – 36 months old. The equipment used were small scale with capacity 100 kg and 0.1 kg accuracy to weight goats, band type and livestock rule to measure exterior characteristics of goats. Semi structured questionnaires were used to interview farmers on their background and goats practiced.

The parameters were consisted of farmers' background and the exterior characteristics of Kejobong goats, including heart girth, body length, shoulder height and ear length. Survey and direct measurement were applied to collect all parameters required.

Heart girth was measured on the breast of goat at the 3-4 costae, behind the legs using band-weight tape, while body length measured on the body of goats from tuberculum lateralis humeralis up to tuberculum ischiadium using livestock ruler. Shoulder height was measured on the highest point of shoulder using livestock ruler. Ear length was measured using band tape at the longest ear. All measurement were conducted when the goats standing at parallelogram position.

The qualitative data were analyzed descriptively, it was consisted of farmers background, the numbers of goats, reason for keeping goats and its production systems, while exterior characteristics of Kejobong goats data was tabulated and analyzed using one way analysis of variance.

RESULT AND DISCUSSION

Physical Appearance of Kejobong Goats

Kejobong goats have massive body as Kacang goats do, so there is a guess of a possibility that the two breeds might be related to each other. There was also a guess that Kejobong goats was a breed resulted from cross mating between Kacang goats with goats from India such as Etawah or Benggala, then underwent natural selection from generation to generation until up to the existence of homogenous black color (Astuti et al., 2007). Based on the direct interview and discussion with the farmers, specific characteristic of Kejobong goats is closed to Bligon goats, it was body size were relatively small, its' ears were almost looked like Bligons which were hanging with curved tips, males and females had varied horns of small sizes. Sodiq and Haryanto (2007) stated that these goats had medium size of body frame. The differences between Kejobong and Bligon goats was the colour, Kejobong goats were mostly black in colour, so that this breed was also called as Black Kejobong goats. Black hair color is highly dominant compared to the other colors of white, brown, and or its combination. Facial profile is mostly romannose which is concave similar to Etawah grade, with convex dorsal line, long body with strong legs and bowl like big breast. Black colour of Kejobong goats might be caused by natural selection as stated by Astuti et al. (2007) that underwent natural selection from generation to generation until up to the existence of homogenous black color. The fact that small vendors in this research area are prefer to slaughter black goats and the price is more expensive than non black goats also supported the development of Kejobong goats.

Background of the Farmers

Farmers' background at Ngudidadi farmers' group, Kedarpan village, Kecobong, based on interviews was presented in Table 1. The age of farmers were varied widely, ranging from 25 up to 75 yeras olds, the average was 48.3 years old. It was indicated that farmers were in productive condition, however, some farmers were unproductive anymore. In addition, goat were seem to be kept by older people. The age of farmers will significantly affect their mobility in keeping goats, the younger farmers will have high motivation and mobility compared to those older farmers, therefore it can be expected that young famers will kept their goats in a better condition so that productivity of goat will improved significantly. Young farmers usually have high motivation so they will rapidly adopt new innovation (Soekartawi (2005), this will improve management of goats keeping, whereas there is a tendency that older farmers (more than 50 years old) will not fully adopt new innovation (late adoption) and keeping goats is a kind of routinity, they do not have high motivation on adopting new innovation (Mardikanto, 1993).

The majority of respondents occupation were farmers, it was 57.14%, while others occupation were hired labour (33.33%) and bussinessman (9.52%), indicating that most goats were kept for multipurposes goals. The result of interview showed that none of the respondent kept goats for main cash income, indicating that goats have not been feasible to be source of main income for the family, it was a secondary activity and act as saving or insurance value, which can be sold at anytime when the farmers need urgent cash, as stated by Budisatria (2006). It was supported by the fact that the main objective of keeping goats were saving (85.71%) and only a few farmers kept goats for profit oriented (14.29%) as presented in Table 2.

Farmers experiences in keeping goats were varied widely, the average was 12.43 years. The less experiences in keeping goats was 3 years, while the advance exveriences was 45 years. This result indicated that farmers has long experiences in keeping goats. The experience on keeping goats will affect the way of goats being kept. The more experinces they have, more goats were kept and better management applied.

Educational background of farmers were relatively low. Majority of farmers educational background were only basic school (76.19%) and only a few farmers has higher education. In addition, there were 14.29% of farmers were in illiteracy conditions. This figure revealed that adoption of new technology on keeping goats could be seriuos problem. Soekartawi (2005) stated that farmers with low educational background will reluctan and find to be difficult to adopt new innovation.

Table 1. Characteristics of Kejobong goat farmers at Kedarpan village, Kejobong

Parameters	Value	
	Range	Average
Numbers of farmers (person)		45
Farmers age (year)	25 - 75	48.33
Occupation (%)		
Farmers		57.14
Hired labour		33.33
Bussinessman		9.52
Experiences in keeping goats (year)	3 - 45	12.43
Educational background (%):		
Illiteracy		14.29
Basic school		76.19
Junior high school		4.76
Senior high school		4.76
Household size (person)	2 - 6	4.15
Household members involved in goat keeping (person)	1 - 3	1.75

Main characteristic of small farmers is involving household labour on goat management practised. The result indicated that household members involved in goat keeping was 1- 1.75 person, the average was 1.75 person. Although the household size was relatively high, 2-6 person per household, involvement of household labour was relatively low. Father and mother were mostly involved in keeping goats, while the children did not have a spesific job, their involvement depended on their time availability. Budisatria (2006) stated that fathers mostly involved in daily management of goats, feed collection and marketing, while cleaning the houses was the responsibility of of the mother. Low involvement of children on keeping goats could be caused by the fact that farmers themselves did not acquire the children to be involved, they focused on their school, furthermore, the farmers themselves did not allow their children to be the farmers, because they have opinion that keeping goats can not be used as a main sources of family income, as stated by Budisatria (2000).

Reason for Keeping Goats and its Production Systems

The average numbers of goats owned by the farmers was 4.10 head per households, the range was two up to eight head (Table 2). The majority of those goats were owned by farmers themselves (76.19%) while 23.81% of them were owned through sharing systems. The composition of goats were dominated by adult and pre-weaning goats, on average it was 1.91 head (46.51%) and 1.21 head (30.23%), while post weaning and young goats were 0.33 and 0.62 head, respectively. The high composition of pre-weaning and adult goats can be understood, since the farming system applied by the farmers was breeding, 90.48% farmers stated that breeding was the main reason for they keep goats.

Land owned by the famers was relatively small, it was varied from 86 up to 20.000 m^2 and the average was 1,782.62 m^2, it consisted of yard, dry land and paddyfield. The majority of land was paddyfield with the average ownership was 962.38 m^2. Land ownership is critical point for the

farmers, because it can be the sources of forages for their goats, however, the number of land possessed by farmers were relatively small.

The objective of keeping Kejobong goats was the main factor affecting the way of goats are kept. Keeping Kejobong goats for saving, which is a kind of insurance against foreseen and unforeseen events, was the main reason for keeping goats. On average, 85.71% farmers stated that they keep goats for saving reason, while only 14.29% stated that they keep goats for profit reason. It is in line with the statement of Budisatria et al. (2007) that main reason for keeping goats is saving. However, none of farmers steted that they keep Kejobong goats for producing

Tabel 2. The numbers of goats, reason for keeping goats and its production systems

	Value	
Parameter	Range	Average
Number of goats per household (head)	2 - 8	4.10
Goats' composition (head) :		
Pre-weaning (0-3 months)		1.24
Post-weaning (3-6 months)		0.33
Young (6-12 motnhs)		0.62
Adults (more than12 months)		1.91
Status of goats' owned (%)		
Self owned		76.19
Sharing		23.81
Land owned (m^2):	86 – 20.000	1,782.62
House compounds and surrounding	0 – 5.000	413.10
Dry land	0 – 5.000	407.14
Paddy field	200 – 20.000	962.38
Reason for keeping Kejobong goats (%):		
Saving		85.71
Manure		0
Profit		14.29
Farming systems (%):		
Feedlot		0
Breeding		90.48
Mixed system		9.52
Manajement system of goats (%):		
Confinement		100
Grazing		0
Mixed		0
Ability to detect heat (%):		
Excellent		9.52
Good		9.52
Fair		42.86
Bad		38.10

manure, it was contradictive result compared to others research (Sarwono et al., 1993; Djoharjani, 1996; Subandriyo, 1998; Budisatria 2000; Budisatria, 2006). One reason given for this condition was goats manure were considerably low in quantity, so the farmers have not interested on keeping goat for manure reason. In the study area, manure to fertilize the land are usally from cattle and anorganic fertilizer.

All of Kejobong goats were kept under confinement systems none of the farmers keep goats under grazxing or mixed systems, as presented in Table 2. The fact that low land possession and low involvement of household labour could be the major limitation for the farmers to keep goast under grazing or mixed systems. Budisatria (2006) stated that limited availability of household member for working with small ruminants could be the main reason why farmers kept their goats

on confinement systems. Grazing was usually done by the children, however, since the children have not involved too much on keeping goats, farmers have changed their management system from grazing or mixed into confinement. Othe reason was most farmers have opinion that goats are better to keep on confinement because of their habit as a browser, while grazing are said to be suitable for sheep, it was in line with statement of Peters (1988) and Budisatria et al. (2010).

The choice to confine goats all days could be also caused by limited access on grazing areas. Over the years, the intensification of land use for crop production has resulted in major changes in small ruminant management. Every arable piece of land is used for the production of human food. Even the dikes between the rice fields on which formerly grass was allowed to grow, are now sometimes used for growing crops such as cassava. A higher demand for crops means, however, that common or private grazing lands become scarce. This process started long ago and still continues today in many parts of Indonesia. Grazing areas are turned into paddy fields. These developments have a great impact on the way small ruminants are kept. These developments have led to a shift in small ruminant production systems from grazing into more intensive. Nowadays the vast majority of small ruminants in Indonesia are kept in confinement (Knipscheer et al., 1984).

Exterior Characteristic of Kejobong Goats

The type of animals and their production capability can be predicted based on the body shape and exterior characteristic. Exterior characteristics is an important information and can be used as initial stages to judge and select potential animal, it could be proved through research by taking factors affecting the animal into account (Sosroamidjojo and Soeradji, 1984). Information on the body size of male and female Kejobong goats at various age was presented in Table 3.

Tabel 3. Exterior characteristics of male and female Kejobong goats at various age

Age (months)	*n*	Sex	Exterior characteristics (cm)			
			G	*BL*	*SH*	*EL*
1-3 ns	15	Male	43,2±3,18	37,2±1,11	41,8±1,32	16,8±0,92
	15	Female	43,2±4,40	38,8±3,34	42,2±3,21	17,8±0,73
6 ns	22	Male	57,9±1,35	49,6±1,45	55,4±1,56	18,2±0,52
	20	Female	58,4±1,14	51,4±0,83	58,0±0,71	18,6±0,37
12 ns	12	Male	68,3±2,04	57,0±1,08	62,0±2,05	19,5±2,50
	18	Female	68,6±1,04	54,8±1,41	62,7±1,55	18,5±0,50
18 ns	16	Male	66,0±1,51	56,5±1,18	62,3±1,53	17,7±0,33
	14	Female	68,6±	56,1±1,30	62,7±1,69	17,5±0,50
24 ns	9	Male	74,0±3,06	59,7±2,60	60,7±0,89	22,0±1,53
	16	Female	71,4±1,31	60,1±0,79	63,8±1,31	19,4±0,93
36 ns	5	Male	72,0±1,20	61,5±1,44	68,0±1,15	23,0±0,58
	12	Female	75,5±2,01	61,0±1,88	67,2±1,30	22,0±1,45
>36	0	Male	-	-	-	-
	11	Female	93,5±5,51	66,3±2,78	68,8±2,59	23,3±0,85

nsNon signifikan, G = Heartgirth, BL = Body length, SH = Shoulder height, EL = Ear length

There is a tendency that female Kejobong goats at one month to 12 months olds have bettter body size than those of male, while for goats more than 12 months old, male Kejobong goats have beteer body size than those of female. Furthermore, body size of Kejobong goats have improved in conjuction with their age, the older goats, the better body size they have, it was caused by during the growth, body compartement and body tissue are gradually developed until it reach the true characteristics. Statistical analysis showed that the body size of male and female Kejobong goats at various age did not significantly differ. Heart girth of male and female pre-

weaning goats (1-3 month old) was around 43 cm, while body length, shoulder height and ear length were 37-39 cm; 42 cm and 17-18 cm, respectively. At six month olds, the exterior characteristics were 58; 49-51; 55-58 and 18 cm, respectively. The exterior characteristics of Kejobong goats were improved gradually in line with their ages. At one year old up to more than three years old, the range of heart girth, body length, shoulder height and ear length were 68.3-93.5; 54.8-66.3; 62.0-68.8and 18.5-23.3 cm, respectively. Nugroho et al. (2007) found that the average of body size of adult male and female Kejobong goats were 22 and 18.27 cm for earl length, 65.58. and 66.20 cm for shoulder height, respectively, while Listyarini et al. (1995) on her research found that body size of adult Kejobong goats were 14.4; 78.7; 50.2 and 58.6 for ear length, heartgirth, body length and body height, respectively. The differences on exterior characteristics of Kejobong goats caused by many factors, Soeparno (1992) stated that growth and body size development are affected by ages, breed, genetic, sex, environment and management, while Hardjosubroto (1994) explained that quantitative traits of animal are depend on the genetic and environmental factors, exterior characteristics is part of growth process of animal.

CONCLUSIONS

Kejobong goats were kept by old farmers with low educational background, small numbers owned and traditional management. Young female Kejobong goats under less than one year old have better exterior characteristics than those of male, in contrast, adult male Kejobong have better exterior characteristic than female.

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