Phenotypic characterization of local Peranakan Etawa goat reared in Polman regency, West Sulawesi

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Abstract. Goats are one of the mainstay commodities for farmers in rural areas, especially in several development centers in the West Sulawesi region, Indonesia. Generally the local goats that are kept are Kacang goats which are the type of meat production, but since the introduction of the Etawa breed most of the goat population that is currently being kept is from the Peranakan Etawa (PE) goat which is a cross between Kacang and Etawa goats which later develop into dual-purpose goats (meat and milk). The purpose of this study was to characterize the phenotypic (qualitative and quantitative) properties of Peranakan Etawa (PE) goats which were maintained by communities in the West Sulawesi region, Indonesia. This study used a survey method by identifying the qualitative and quantitative performance of the PE goat population. Characterization activities carried out were to identify the performance criteria of qualitative traits which included the characteristics of coat color, horn and ear shape and quantitative properties such as body weight, height, body length and chest circumference and chest width. A total of 113 goats (111 females and 2 male Peranakan Etawa breeds) were selected to be used as samples from the existing goat population. Peranakan Etawa breeding performance based on morphometric data included the characteristics of shoulder height (67.98 ± 5.61 cm), back height (71.34 ± 5.73 cm), body length (71.70 ± 6.46 cm), chest circumference (72.19 ± 6.46 cm), chest width (15.41 ± 1.86 cm) and body weight (33.04 ± 6.09 kg). The qualitative and quantitative performance of Etawa breeds in West Sulawesi is very diverse and need genetic improvement to meet Indonesia National Quality Standards (SNI).

1. Introduction
Goat has an important role in rural communities, this livestock is needed both as a source of animal protein but also needed in religious rituals such as the celebration of newborns (aqiqah) especially in most moslem countries [1]. The performance of local goats is still low causing the rampant crossing programs carried out by the community by using exotic breeds, the types of goats commonly used are from the Etawa type, and recently it has also begun to be introduced from the Boer goat type [2].

Study of utilization of the genetic potential of local goat is one of the major fields of study in research roadmap on animal breeding research group in the Faculty of Animal Husbandry, Hasanuddin University. Crossbreeding program by utilizing the genetic potential of local goats ie. Kacang, Peranakan Etawa and Marica goats has been started since 2012 [2,3]. Crossbreeding between two or more breed in ruminants is one good way to improve productivity. Selection of a certain superior breed in crossbreeding programs are very important. It is known that the breed of goats in the tropics,
including Kacang and PE goats generally have certain advantages in terms of fertility and adaptation to environmental conditions.

Birth weight and growth rate on a goat breed depends on the potential of its weight when it reaches maturity, so that the growth rate of kid on goat breed with large type would be higher than in small type goat [4]. Local goat genetic performance associated with the growth rate and a low slaughter weight is one of the problems faced by farmers in developing local livestock.

Low productivity requires an effort that is quick and easy solution implemented at the level of the farmer. Many factors determine productivity, but the most important factor is the nutrition and genetics. Improvement of the productivity of local goats through the improvement of the quality of the feed (nutritional) and management can not be passed on the offsprings, but an increase in productivity by improving the genetic quality can be passed on to its offspring and can be done with the selection program and crossbreeding with the superior breed. Introduction of exotic breed coming from the tropics in crossbreeding programs with local goat expected to result in higher production capacity. In the Kacang goat instance, this approach has produced Boerka goat with increased productivity (weight of weaning the kid/doe/year) by 42% higher than Kacang goats [5].

This study aimed to characterize the performance of phenotype based on the nature of the qualitative and quantitative traits of goats that are kept by farmers in Polman regency, West Sulawesi to get an overview of potential genetic owned by local goat reared to be used in a sustainable manner in order to produce goat superior.

2. Methods
This study was conducted in centers of development in the village goats Tandasura District of Limboro Polman (Polewali Mandar), West Sulawesi (about 250 km from the city of Makassar). This particular herd to maintain and develop local goat like Kacang and Peranakan Etawa (PE) and intensively reared.

This study using Peranakan Etawa (PE) goats. In the early stages of this activity used about 111 heads of Peranakan Etawa (PE) does and 2 heads PE buck. Feedd that used to support the improvement of the performance of goats commonly used are derived from forage legume tree (Sesbania glandiflora, Leucaena leucochepala and Gliricidia maculata) and sago that were widely cultivated by the surrounding community. PE goats identified candidate sires from partner groups, with some criteria such as performance based on qualitative characteristics of the prospective parent (coat color and shape of the horns), as well as other morphometric parameters which include chest circumference, body length, height and weight. In addition to the characteristics of goats, as additional data, this study also identified the characteristics of the breeders' community to get a picture of the management patterns undertaken as well as the scale of their business and education level.

In addition to the characteristics of goats, as additional data in this study also identified characteristics of the breeder to get an overview of management practices carried out and the economic scale of operations and the level of their education. The qualitative data obtained were analyzed descriptively while morphometric performance data were tabulated and averaged to obtain the mean and standard deviation values were then analyzed descriptively.

3. Results and discussion

3.1. Characteristic and economic scale of goat farmers bussiness
This research was conducted in the Tandasura village of Limboro District, Polewali Mandar regency, West Sulawesi province. The farmer groups that serve as a partner in this activity is Samalewu Farmers Group. The number of members of farmer groups as many as 26 peoples at a scale maintenance of goats varies between 2-5 heads per member. Total number of goat maintained in this group as many as 157 does with the kid as many as 59 heads.

The average level of education of farmers is still low, only up to the fundamental education elementary or junior high school. Only a small portion of the members of farmers who already have
higher education as the coordinator of the group that has educated master. Coordinator of this group thus facilitating research activities can be run well so that the concept of improvement of the genetic quality of livestock they can be understood and fairly high level of participation.

3.2. Qualitative characteristics of the PE goats

PE goat reared by farmers, usually from crosses with Kacang goats that can be seen from the characteristics of the dominant coat color that were generally dominated by white, brown or black. Complete goat coat color variation of the candidate sires are presented in table 1.

| Qualitative trait                      | Percentage (%) |
|---------------------------------------|----------------|
| Coat Color                            |                |
| White                                 | 4              |
| White spotted                         | 4              |
| Brown (whole body)                    | 12             |
| Brown in the head and neck            | 62             |
| Black (whole body)                    | 12             |
| Black in the head and neck            | 6              |
| Horn present or not                   |                |
| Horn                                  | 100            |
| Polled                                | 0              |
| Ear shape                             |                |
| Long and narrow at the bottom droop   | 75             |
| Short and wide                        | 25             |

The dominant coat color variations on goat in Polman maintained by farmers groups were generally brown in the neck until the head with white on the back of the body. Characteristics of the coat color was not uniform, and if it is associated with the qualitative characteristics of goats in accordance with SNI (Indonesian National Standart) namely: black color on the head until the neck and white on the back of the body or mixed color white with brown (SNI 7352: 2008) [6].

Other colors are quite common in goats in this area was brown color or black color in the entire body. Brown and black color was probably the color inherited from Kacang goats which is commonly kept by people in this area prior to the introduction of Etawa goats.

![Figure 1. Coat color variation of PE goats in Polman regency](image)
3.3. Quantitative traits of the PE goats

Morphometric characteristics of PE doe used in this research activity could be seen in table 2. The performance characteristics include a description of the Body Length (BL), Shoulder Height (SH), Hip height (HH), Chest Circumference (CC), as well as the Chest Width (CW).

| Characteristics           | Mean ± SD | Buck (n=2)   | Doe (n=75)   |
|---------------------------|-----------|--------------|--------------|
| Shoulder height (cm)      | 85.5 ± 2.12 | 67.98 ± 5.61 |
| Hip height (cm)           | 94.5 ± 0.71  | 71.34 ± 5.73  |
| Body length (cm)          | 90.5 ± 2.12  | 71.70 ± 6.46  |
| Chest circumference (cm)  | 88.5 ± 0.71  | 72.19 ± 6.46  |
| Chest width (cm)          | 22 ± 1.41    | 15.41 ± 1.86  |
| Body weight (kg)          | 60.75 ± 4.60 | 33.04 ± 6.09  |

4. Conclusion

The qualitative and quantitative performance of Peranakan Etawa goats in West Sulawesi region was very diverse and need genetic improvement to meet Indonesia National Quality Standards.

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