

Conference Paper

Qualitative Assessment of Batur Sheeps Kept by Smallholder Farmers in Banjarnegara, Indonesia

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Abstract.

Batur sheep is one of Indonesian's local sheep species with the original geographical distribution in the Batur District and surrounding areas. This study was conducted to determine the suitability of the Batur sheep that were kept by smallholder farmers. The study was conducted in Batur Village, Banjarnegara Regency, Indonesia in February 2020 by identifying the qualitative traits of Batur sheeps (64 males and 129 females) compared to other sheep breeds. Qualitative data were then transformed into dummy data and given scores in each category. Data were analyzed descriptively using Chi-square analysis and Independent Sample T-Test. The Chi-square analysis findings determined ($P < 0.05$) the qualitative characteristics, which included the face profile, the face wool coat density, and the suitability score of the male and female of the Batur sheep breed. The total of 98.6% male and 74.4% female sheep had suitable qualitative characteristics to the Batur sheep breed with suitability scores of 91.72 and 81.90, respectively. In conclusion, the male and female Batur sheep on Batur Village, Banjarnegara Regency, Indonesia, was still suitable to Batur sheep breed based on the assessment of the body's phenotypic assessment.

Keywords: Body characteristics, Exterior traits, Local sheep, Phenotypic assessment, Suitability value

1. Introduction

Batur sheep are the result of crossbreeding between Merino sheep and Thin-Tailed sheep with original geographical distribution on the Batur District and surrounding areas. This sheep has been developed by farmers for generations since 1974. Batur sheep has been designated as one of Indonesian local sheep breed by Decree of the Ministry of Agriculture of the Republic of Indonesia No. 2916/Kpts/OT.140/6/2011 [1]. Batur

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Village, Batur District, Banjarnegara Regency is located at an altitude of 1,663 m above sea level, with an average temperature of 18°C, rainfall 84 mm/year, with a high number of wet months, namely three months moist and two months dry. Such environmental conditions are very suitable for the development of sheep that have wool [2].

The Batur sheep business in Batur District is mostly dominated by smallholder farmers and as a sideline business with a traditional system [3]. Problems encountered in the development of Batur sheep include the limited development in Batur District and its surroundings, there are many uncontrolled sales outside Banjarnegara Regency, and there are indications of crossbreeding with other breeds [2]. Supply and demand for sheep increase especially during the Eid al-Adha period [4,5]. The population of Batur sheep in Banjarnegara Regency has decreased by 15% per year over the last few years, wherein 2019 there were only around 8,000 heads [6]. The existence of these problems if not balanced with the right innovation, there will be a population decline and does not rule out that the quality of Batur sheep in the Batur village has also decreased both genetic and phenotypic quality. Efforts are needed in the development and improvement of the quality of Batur sheep so that these sheep are maintained in their sustainability and quality.

Various efforts have been carried out by the Banjarnegara Regency Government to maintain, preserve, and develop Batur sheep as germplasm of Banjarnegara Regency [2]. Some of the efforts that have been made are counseling, assisting livestock groups, and holding livestock contests. The Batur sheep contest is usually held once a year which is held at the Dieng Mountain tourist site which is also a tourism attraction in the district. In the contest, there are several categories of competitions such as ram, doe, a ram lamb, and doe lamb, where one of the criteria assessed in the contest is its qualitative traits. The qualitative traits of Batur sheep assessed according to data that has been determined based on the Decree of the Ministry of Agriculture of the Republic Indonesia No. 2916/Kpts/OT.140/6/2011 [1].

The sale of Batur sheep out of under-controlled areas and indications of crossing with other sheep breeds does not rule out the quality of the Batur region will decline, including its qualitative characteristics. This study was conducted to determine the qualitative and suitability assessment of Batur sheep that are kept by smallholder farmers. The results obtained can be used as a current database and as an evaluation material in the development and improvement of the quality of Batur sheep.

2. Materials and Methods

This study was carried out in Batur Village, Batur District, Banjarnegara Regency, Central Java, Indonesia. The study was conducted by observation of qualitative characteristics in 64 male and 129 female Batur sheep. Qualitative characteristics were observed based on the exterior characteristics of Batur sheep according to the Ministry of Agriculture of the Republic of Indonesia No. 2916/Kpts/OT.140/6/2011[1,7], namely body coat color, head color, face profile, wool on face, wool on the abdomen, wool on legs, and present or absent of horns. Qualitative data is transformed into dummy variables, if the result “yes” is given a value of 1 and if “no” is given a value of 0. For evaluating the suitability of Batur sheep breeds, a value is given that refers to the assessment of Batur sheep by the Department of Agriculture, Fisheries, and Animal Husbandry of Banjarnegara Regency [7], i.e. white body coat color (yes=5), white head color (yes=5), convex face profile (yes=20), wool covering from head to face (yes=30), wool covering the abdomen (yes=10), wool covers the legs (yes=10), and absent of horn (yes=20). Batur sheep are suitable for the criteria if the minimum total value is 80. Data are analyzed using descriptive analysis (percentage) and a comparison is performed between males and females using Chi-Square analysis. Breed suitability evaluation values were analyzed using the Independent-Samples T-Test analysis. Analyzes were performed using SPSS version 25 software (IBM, USA).

3. Results and Discussion

Sheep that are kept in Batur village, Banjarnegara Regency, have morphological features that are similar to local crossbreeding and Merino sheep [8,9]. Batur sheep has the potential to be developed as a meat producer because it has fast growth with a daily weight gain of around 150 g/day, body weight at the age of 2 years can reach 120 kg male and 80 kg female. This sheep also has the potential as a producer of quality wool which can be processed into a commodity of high economic value [2,10]. Batur sheep have a unique body shape, namely the dominant white hair color and cover almost the entire body to the face, the form of small ears pointing to the side, convex face profile, small and short tail shape with a tapered tip, large body shape and tend to be short with posture strong legs and not horned both males and females. The qualitative characteristics have been determined based on the Decree of the Ministry of Agriculture of the Republic of Indonesia No. 2916/Kpts/OT.140/6/2011 [1]. Male and female Batur sheep as shown in Figure 1.



Figure 1: Male and female Batur sheep.

Table 1 shows that Batur sheep kept by smallholder farmers in Batur village mostly have white body and face coat color, a short and convex face profile, no horns, and have wool that covers the face, abdomen, and legs, both on males and females. There was a significant correlation ($P < 0.01$) between sex with the face profile, face wool, and breed suitability, whereas with body coat color, face coat color, abdomen cover wool, leg cover wool, and horn there was no significant relationship. This means that between male and female Batur sheep have the same body coat color, face coat color, wool on the abdomen, wool on the legs, and the same horn characteristics. Overall, the sheep have characteristics that are suitable for the Batur sheep breed, both male and female, based on the Decree of the Ministry of Agriculture of the Republic of Indonesia [1].

There was a difference between males and females on the face profile of Batur sheep (Table 1), where the proportion of the number of non-convex face profiles in females is almost the same as the convex ones, as well as with wool covering the head to the face. Based on the suitability evaluation of Batur sheep breeds, it is also seen that there was a difference between males and female on breed suitability, although male and female sheep have a greater percentage of conformity than those that are not suitable, in female sheep, there are 25.6% that do not meet the minimum requirements of Batur sheep characteristics, where the number is classified as large.

More than 90% of male and female Batur sheep have a white body and face coat color. Besides white color, there is also a combination of white, black, and brown colors. The body coat color of sheep in this study is still many that match the color of Batur sheep according to the Decree of the Ministry of Agriculture [1]. The body and head coat color of Batur sheep in this study have a color variation that is almost the same as Wonosobo sheep [11], but no more varied than the body coat color of the Garut sheep [12,13] and Awassi sheep [14], i.e. brown, white, black, and a combination of the three. Most of the Batur sheep in this study have wool hair covering the face, abdomen, and

TABLE 1: Qualitative characteristics of male and female Batur sheep.

Parameter	Male (%)	Female (%)	Polled (%)	X ² -value	P-value
N (head)	64	129	193		
White body coat color?					
Yes	95.3	97.7	96.9	0.792	0.373
No	4.7	2.3	3.1		
Whiteface coat color?					
Yes	93.8	96.1	95.3	0.542	0.461
No	6.3	3.9	4.7		
Convex face profile?					
Yes	79.7	58.1	65.3	8.764	0.003
No	20.3	41.9	34.7		
Wool covering face?					
Yes	92.2	75.2	80.8	7.972	0.005
No	7.8	24.8	19.2		
Wool covering abdomen?					
Yes	98.4	91.5	93.8	3.558	0.059
No	1.6	8.5	6.2		
Wool covering legs?					
Yes	93.8	89.1	90.7	1.072	0.301
No	6.3	10.9	9.3		
Absence of horn?					
Yes	98.4	99.2	99.0	0.259	0.611
No	1.6	0.8	1.0		
Breed suitability					
Suitable	90.6	74.4	79.8	6.968	0.008
Not suitable	9.4	25.6	20.2		

legs, which is a differentiator with wool characteristics in Wonosobo sheep which are absent on the face and lower on abdomen and legs [11]. The white body coat color of sheep becomes one of the characteristics of consumer preferences in Yogyakarta to be sacrificed animals [15].

The face profile of the Batur sheep according to the Ministry of Agriculture [1] is convex. In this study, there were more than 20% which did not show a convex face profile, almost the same as Wonosobo sheep [16] and different from Liberian sheep which were mostly straight [17]. On average 99% of male and female Batur sheep absent the horns. This shows that the criteria for the presence or absence of horns, many of the sheep are following the criteria of Batur sheep [1]. In contrast to other breeds, especially male Garut sheep which have a variety of forms of the horn [12].

TABLE 2: Assessment of suitability of Batur sheep breeds based on qualitative characteristics.

Parameters	Male	Female	Polled
Body coat color (0-5) ^{ns}	4.61±1.35	4.96±0.44	4.85±0.87
Face coat color (0-5) ^{ns}	4.61±1.35	4.85±0.87	4.77±1.06
Face profiles (0-20)	15.94±8.11 ^b	11.62±9.91 ^a	13.06±9.55
Face wool coat density (0-30)	27.66±8.12 ^b	22.56±13.01 ^a	24.25±11.84
Abdomen wool coat density (0-10)	9.84±1.25 ^b	9.15±2.80 ^a	9.38±2.42
Leg wool coat density (0-10) ^{ns}	9.38±2.44	8.92±3.12	9.07±2.92
Absence of horn (0-20) ^{ns}	19.69±2.50	19.85±1.76	19.79±2.03
Suitability score (80-100)	91.72±14.91 ^b	81.90±23.63 ^a	85.16±21.60

^{a,b} Different superscripts in the same row indicated different significantly (P<0.05), ^{ns} Non-significant

The assessment of breed suitability based on qualitative parameters is presented in Table 2. Based on the table it can be seen that there is a difference (P<0.05) in face profile, face and abdomen wool coat density, and breed suitability score, while other parameters are not significantly different. There was no significant difference between males and females of Batur sheep on the abdomen wool coat (Table 1), but the conformity value was greater (P<0.05) in males than females (Table 2). Males Batur sheep have a greater score on the face profile suitability and face wool coat density (P<0.05) than females. In total, the suitability score in male Batur sheep is greater (P<0.05) than female Batur sheep, however, both have scored above the required standard score, which is a minimum score of 80 [7].

4. Conclusions

The male and female Batur sheep have different qualitative characteristics the face profile, face wool coat density, and suitability score. The total of 98.6% male and 74.4% female sheep had suitable qualitative characteristics to the Batur sheep breed with a suitability score of 91.72 and 81.90, respectively. In conclusion, the male and female Batur sheep on Batur Village, Banjarnegara, Indonesia, was still suitable to Batur sheep breed based on the assessment of the body's phenotypic qualitative.

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