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ABILITY KAMBING SABURAI BETINA DI KECAMATAN SUMBEREJO, GISTING, DAN KOTA AGUNG TIMUR KABUPATEN TANGGAMUS", Jurnal Riset dan Inovasi Peternakan (Journal of Research and Innovation of Animals), 2021

paper text:

1GENETIC AND PHENOTYPE CORRELATION OF WEANING AND YEARLING WEIGHT OF FEMALE SABURAI GOATS IN SUMBEREJO DISTRICT, TANGGAMUS

REGENCY, LAMPUNG PROVINCE, INDONESIA Kusuma Adhianto, Satria Ibnu Lenanto, Akhmad Dakhlan, and

12Muhamad Dima Iqbal Hamdani Department of Animal Husbandry, Faculty of Agriculture, University of Lampung

Jl. Prof. Dr. Soemantri Brojonegoro No.1 Gedong Meneng Bandar Lampung 35145 Telp. (0721) 704946, Fax. (0721)770347 *) coresponding author :

3kusuma.adhianto@fp.unila.ac.id

GENETIC AND PHENOTYPE CORRELATION OF WEANING AND ONE YEAR

11WEIGHT OF FEMALE SABURAI GOATS IN SUMBEREJO DISTRICT, TANGGAMUS

REGENCY, LAMPUNG PROVINCE, INDONESIA ABSTRACT Background: Lampung Province is currently developing one type of goat family, namely Saburai goat. The Saburai goat is a beef goat from across grading up between a male Boer goat mated with a female Etawa Peranakan (PE) goat.

24 **The objectives of** this **research were to find out**

:

1 **the value of genetic and phenotypic correlation between weaning weight and** one year **weight of** female **Saburai goats in Sumberejo** District, **Tanggamus District**

. Materials and methods: Total 100 female of Saburai goats

1 **aged one year were used in this study. This research**

data uses

1 **primary and secondary data** taken from **direct** observations **in the field and** livestock **recording** data **from Sumberejo** District. **The method used** is a **survey method, the** research **sample** is **determined by purposive sampling**

.

25 **The data were analyzed using the** step- father **correlation** method. **The**

observed variables included weaning weight and one year weight. Results:

1 **the average weaning weight of** female **Saburai goats in Sumberejo** District **was** 16.4±**2**.0 **kg, and the average weight** for one year **was**

36.9±2.5 kg. The male Saburai goat has a genetic correlation value of 0.30 which is categorized as medium positive, a phenotypic correlation of 0.27 which has a low positive value, and an environmental correlation of 0.47 which has a high positive value. The results of this study indicate that environmental factors have a major influence on goat performance. Conclusion: obtained is to increase body weight for one year for female Saburai goats can be done through weaning weight selection. Keywords: Saburai goat, weaning weight, one year weight, genetic correlation, phenotypic correlation INTRODUCTION The livestock sector is one sector that has high potential to continue to be developed in Indonesia. The livestock sector can produce various kinds of products such as meat, eggs and milk to meet the needs of the community, especially as a provider of animal protein. In the livestock sector, there are several commodities that can be developed and one commodity that has high potential is goat. The commodity of goats is one type of livestock that is in great demand among the people of Indonesia because of its high economic value. In addition to having high economic value, goats also have other advantages, namely the land required for maintenance is not too large, the labor required is small and has the ability to adapt quickly to the environment. In 2018 the goat population in Indonesia reached 18,720,706 heads. The largest goat population in Indonesia is on the island of Java as much as 53.76%, and the rest are spread outside Java, one of which is Lampung Province.

3**Lampung Province is a province** outside Java **with the highest population** of goats **compared to other**

provinces. The recorded

13**population of goats in Lampung Province** reaches **1**,297,872 **heads**

(BPS, 2018). Lampung Province is currently developing one type of goat family, namely Saburai goat. Saburai goat is a type of goat that has been designated as

7**a local genetic resource** in **Lampung Province based on** the **Decree of the Minister of Agriculture of the Republic of Indonesia** Number **359/Kpts/PK.040/6/2015. The**

Saburai goat is a beef goat from across grading up between a male Boer goat mated with a female Etawa Peranakan (PE) goat (Sulastri and Sukur, 2015; Adhianto et al., 2015). Saburai goats in Indonesia have been designated as germplasm that must be maintained so that the population can continue to grow and its performance can be improved so that it can become one of the livestock commodities that can meet the needs of meat in Indonesia and provide many benefits for the breeder. The superiority of the Saburai goat itself is that in addition to a high level of adaptation to its environment, its maintenance is easier and itsrate growth is quite high (Adhianto

16**et al., 2019**; Adhianto **et al**., 2021; Sulastri **et al., 2019). The** performance **of**

an animal is influenced by several factors during its growth period. Therefore, selection of livestock is carried out to get superior goat. Selection is carried out on young livestock as a reference for the growth of an animal that will be reared to get more effective results.

21**Weaning weight can be used as** a **selection** criterion **for**

cattle to get superior goat, because selection on weaning weight can be used to increase the weight of one year of goat. Weaning weights have a

8**high heritability value and** a high **genetic correlation with** a **yearling weight**

(Dickerson et al., 1974). Goat production performance that is strongly influenced by two factors, namely genetic and environmental factors. Saburai goats in Sumberejo District have different or the same production performance, it really depends on genetic and environmental factors that influence whether there are similarities or differences. The genetic enhancement potential is highly dependent on the

6**genetic variation of the trait and its relationship** to **other traits**

. Genetic correlation provides

6information that genes that affect **one trait also affect other traits**. Selection **effectiveness and genetic progress can be** evaluated **when selection is made for more than one trait. Genetic**

correlation also helps in describing the relationship between the genes

6responsible for the genetic variation **of the two traits**

(Falconer and Mackay, 1997; Sulastri et al., 2018). To evaluate the selection response on correlated traits, it is important

18to estimate the genetic correlation between the two traits

.

26Therefore, this study was conducted with the aim

of estimating

9genetic, phenotypic, and environmental correlations between weaning weight and yearling weight of female Saburai **goats**

. It is hoped that later this research will assist in the development of a breeding plan for genetic improvement in female

3Saburai goats in Sumberejo District, **Tanggamus Regency, Lampung Province**

, Indonesia.

19MATERIALS AND METHODS This research **was conducted at the** Saburai **goat** farm belonging **at**

Pelita Karya III, Akur Nusa Jaya, and Mitra Usaha breeder farm group

11in Sumberejo District, Tanggamus Regency, Lampung Province, Indonesia. **Research**

materials consist of primary data and secondary originating from a minimum of 50 female Saburai goats. Primary data includes weighing one year old female Saburai goats and conducting interviews with farmers. Secondary data in the form of weaning weight obtained from recording female Saburai goats.

5**The tools used in this study** include writing instruments, **digital** cameras, weighing **scales with a capacity of** 120 **kg with** an **accuracy of 0**.1 **kg**, measuring tapes, **and** questionnaires. **Methods**

3**This study** used **a survey method** using primary **and** secondary data. **The research sample** was **determined by purposive sampling**

by observing female Saburai goat with 1 year age at the study site. Primary data was obtained by weighing the body of one year age goat and conducting interviews with farmers. Secondary data was obtained from the results of measurements and weighing carried out by farmers on goats that were observed and recording card at the time of weaning. After the data was tabulated and corrected for weaning weights and yearling weights,

23**analysis of variance** and variance **was** then **carried out to** estimate **the**

genetic, phenotypic, and environmental correlation values using the sibling and sibling correlation method. Genetic correlation, phenotype, and environment are calculated by the following formula: Estimated genetic correlation (rG) is calculated by the formula: Description: covs = variation of female offspring in males 2 s(1) = weaning weight variance 2 s(2) = one-year weight variance Estimated phenotypic correlation (rP) is calculated by the formula: Description: Covw = male variance Covs = diversification of the female in the male 2 w = variety of daughters in males 2 s = female variance Estimated environmental correlation (rE) is calculated by the formula: Description: Covw diversification Covs 2 w 2 s = male = diversification of the female in the male = variety of daughters in males = female variety RESULTS AND DISCUSSION Weaning and yearling weight Weaning weight is the result of weighing the young goats when they are separated from the does. Weaning weight is influenced by the condition of the mother, litter size and condition of goat kids (Sutama, 2007), while the weight of one year is greatly influenced during the growth period post-weaning starting from weaning (based on weaning weight) to the age of one year (based on the age of one year) (Edey, 1983). According to Simon et al. (2004) age and body weight at the time of first puberty (annual weight) are factors that can affect livestock productivity, the faster the cattle experience the first cycle with good body weight, the livestock production will increase. In this study, there were 100 female Saburai goats consisting of 10 males, each of which had 10 female Saburai goats. The female Saburai goat studied in Sumberejo District was the result of natural mating. The average weaning weight and one year weight of female Saburai goats from several existing males

15**can be seen in Table 1**. In **Table 1** shows the **results of**

22**the weaning weight of female Saburai goats** that varies, **this**

is presumably due to different environmental influences.

2**Based on the results of** this **study, the average**

weaning and one-year weight of female Saburai goats were 16.4±2.0 kg and 36.9±2.5 kg, respectively. The results of the study on weaning weight and one year of female Saburai goats obtained were

. (2017), namely lower weaning weight (14.9±3.7 kg) and lower one-year weight (34.7±5.2 kg), whereas when compared with the results of the study of Sulastri et al. (2014) which stated that the weaning weight of Saburai goat was 19.67±1.54 and the one-year weight of Saburai goat was 42.27±2.12. In the results of this study when compared with the results of the study of Sulastri et al. (2014) the results are lower, this is because the results obtained from this study are only data from female Saburai goats, where when compared to male goats with female goats the growth pattern is higher than male goats. The difference in the results of this study may be due to apart from genetic factors, environmental factors begin to affect the growth of goats, especially feed. The availability of forage during the research period can affect growth, the feed consumed by the mother to produce milk and for the young goats greatly affects the growth of the young goats during the weaning period. This is in accordance with the opinion of Edey (1983) that weaning weight can be influenced by genetic factors, birth weight, mother's milk production, litter size, parent age, child sex, feed, and parity. The breeders in Sumberejo District provide feed to their livestock only by giving the type of leaves and also ramban which are given alternately to livestock without any concentrate. This is in accordance with the statement of Adhianto et al. (2017) in the Sumberejo and Gisting sub-districts, the breeders carried out treatment by providing forage feed without concentrate, as well as providing drinking water as needed. Concentrate is made and given to livestock when it is difficult to find forage, this usually only occurs during the long dry season. Animal feed consisting of a mixture of grasses and leaves with an equal ratio of 1: 1, from all the mixtures of forage materials it can meet and complete the nutritional needs needed by goats (Setiawan and Arsa, 2003; Adhianto

of the young to obtain milk and grow. The size of the weaning weight obtained is influenced by the genetics of the mother and the productivity of the mother when breastfeeding. In the opinion of Subandriyo (1998) that the weight of the goats when weaned is also influenced by the type of birth. This is due to the limited production of milk from the mother, so that if the mother has twins, the limited amount of mother's milk must be divided. Weaning weight is a reflection of the growth of an animal because it can determine the ability of livestock production at the age of one year, because weaning weight and one year weight are correlated. If the weaning weight is high, the one-year weight will also be high, but if the weaning weight is low, the one-year weight will also be low. As according to Dakhlan and Sulastri (2002) cempe that have high weaning weights generally show rapidgrowth post-weaning. However, this cannot rule out the possibility that yearling weight does not match the weaning weight, this can be caused by environmental factors and different maintenance during the weaning and one year life span. This is in accordance with the

two main factors, namely genetics and the environment. Genetic factors determine the ability of production, while the environment is a supporter so that livestock are able to produce according to their abilities. Genetic correlation, phenotype, and environment Correlation is a measure of the closeness of the relationship between two traits. The two traits are said to be correlated if changes in one trait will be followed by changes in the other traits regularly, in the same or opposite directions (Nugroho et al. 2008). The performance of

> 3**is influenced by genetic**, phenotype, **and environmental factors**

. The results obtained from goat performance can be different or the same depending on the factors that influence it. Based on data analysis, the correlation of

> 9**genetic, phenotypic and environmental between weaning weight and yearling weight** Saburai female goat **in**

the District Sumberejo Tanggamus presented in Table 2.

> 8**Genetic correlation is the** relationship **between** single **breeding values for two traits. The** value **of**

genetic correlation shows the relationship between two traits that are passed down by parents to their offspring (Edey et al. 1981). The genetic

> 1**correlation between weaning weight and** one-year **weight of** female **Saburai goats in Sumberejo District**

showed a positive result of 0.30. The results of the genetic correlation showed acorrelation value positive moderate,

> 2**in accordance with the** statement **of** Warwick **et al**. (1995) which states **that the** correlation **value**

can be said to be moderately positive if the value is 0.01 to 0.3. The genetic correlation shows a moderate positive direction so that it shows a close relationship between variables. This is in accordance

> 2**with the statement of** Zhang **et al**. (2008) **which states that**

this is due to the fact that traits at the same age are controlled by the same genes at the same time, thereby reducing environmental variation and increasing additive genetic variance. According to Lasley (1978), correlations that have a positive value are very useful in genetic improvement programs through selection, with increasing the production of one trait through selection will increase other correlated traits. This means that selection on weaning weight will provide a selection response that is in line with yearling's weight and weaning growth rate, or in other words,

> 2**an increase in** weaning **weight** will be **followed by an increase in** yearling **weight**

and also post-weaning growth rate. According to Sulastri et al. (2002) the positive correlation value between birth weight and weaning weight is included in the high category, which means that the higher the birth weight, the higher the cattle weaning weight. In the results of this study, there was a moderate positive

20**genetic correlation between weaning weight and yearling weight** so **that**

at the weaning age of female Saburai goats, it could be used as a reference for selection time to be used as candidates for the next superior breed. This is in accordance with the statement of Beyleto

8**et al. (2010) that the genetic correlation** value **between birth weight** and **weaning weight and** weaning **weight**

with yearling weight has a high correlation value where if the birth weight is high, the weaning weight will be high as well as the annual weaning weight. The parameters needed to conduct selection on livestock at a certain age are genetic and phenotypic correlations. According to Kurnianto (2010), the selection program requires knowledge of the value of genetic and phenotypic correlations to predict future livestock productivity. Phenotypic correlation consists of genetic and correlation environmental correlation. Phenotypic correlation is the total correlation of all traits possessed by livestock. Phenotypic correlation values are useful for estimating the magnitude of changes in productivity in the same generation when used as selection criteria based on current productivity records (Warwick et al., 1984). The phenotypic correlation in this study

1**between weaning weight and** one-year **weight of** female **Saburai goats in Sumberejo** sub-**district**

showed a moderate positive result of 0.27. This is

2**in accordance with the** statement **of** Warwick **et al**. (1995) **that** if **the value of a**

correlation is 0.1 to 0.3 then it is in the medium category. The phenotypic correlation between growth times is lower than the genetic correlation, this is due to the influence of the environmental correlation Hardjosubroto (1994). Meanwhile, according to Jafari et al. (2012) that a positive phenotypic correlation value with a moderate to high category means that

17**there is** no **genetic** antagonism **between** the **two traits** and **selection for one** of **the**

two traits can lead to changes in the other traits. According to Tama et al. (2016) the productivity of an animal is influenced by two main factors, namely genetics and the environment. Genetic factors determine the ability of production, while the environment is a supporter so that livestock are able to produce according to their abilities. Environmental factors include feed, housing, maintenance, disease and climate. Genetics and the environment have an important role, because even though livestock have superior genetics, without the support of good maintenance and feeding, their production will not be optimal. On the other hand, even if the cattle are given good feed, they do not have superior genetics, the production will not be maximized. The environmental correlation value in the study

1**between weaning weight and** one-year **weight of** female **Saburai goats in Sumberejo district**

showed a high positive value of 0.47. This result can be stated as high positive based on the statement of Warwick et al. (1995) if the correlation value is in the range of 0.3 to 1.0, it is included in the high category. In the results of this study, the environmental correlation value has the highest value after the genetic and phenotypic correlation values. The result of the environmental correlation value is higher than the others because environmental factors have a big influence on growth performance in livestock. The influence of environmental factors on livestock has a percentage of 70% while from genetic factors it is only 30%. This shows that environmental improvements during weaning will also increase body weight at one year of age and the next period.

10**CONCLUSIONS AND SUGGESTIONS Conclusion Based on the results of research and discussion, it can be concluded** that **the**

correlation value

1**between weaning weight and** one-year **weight of** female **Saburai goats in Sumberejo District**

has a genetic correlation value of 0.30 which is moderately positive, 0.27 phenotype is moderately positive, and environmental 0.47 which has a high positive value. Suggestion

2**Based on the results of this study, it** is suggested **that**

Saburai goat breeders in the Sumberejo sub-district need to conduct selection of weaning weight continuously because it can increase the weight for one year, so that it can be used as a prospective broodstock later.

4**Acknowledgements We would like to thank the Ministry of Research and Higher Education who financed this research through Penelitian** Terapan **Unggulan Perguruan Tinggi** (PTUPT) **Fund research scheme**

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