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Characteristics of qualitative and quantitative properties of chicken village in the Sub-District Lasusua, North Kolaka District

La Ode Nafiu, Musram Abadi*, and Inra Wati

Faculty of Animal Science, Halu Oleo University, Kendari, Southeast Sulawesi, Indonesia

**Corresponding author's e-mail: musram.abadi8@gmail.com*

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ABSTRACT

The purpose of this research is to know the characteristics of the qualitative and quantitative properties of village chicken in the Lasusua sub-district of North Kolaka district. The research was conducted in December 2018 to January 2019 in Lasusua sub-district of North Kolaka district. The variables observed in this study are qualitative and quantitative properties. The results are shown that both males and females of village chicken are dominated by colored fur colors, Columbian fur patterns, lauric fur patterns, and golden fur flicker. Color White/Yellow shank and a single shape Ginger. The average body weight of chickens 1,681.92 grams and females 1,305.45 grams. Long Shank Rooster 9.97 cm while females 8.34 cm. Tibia length 9.70 cm in males, 9.37 cm in females. The femur length is 13.07 cm in males and 11.87 cm in females. The length of the wingspan is 14.44 cm and females 12.49 cm. Male circumference 30.50 cm and female 29.59 cm. Male back length 14.17 cm and females 12.23 cm. Duration of the lung in males 1.96 cm and 1.94 cm in females.

Keywords:
Chicken village, Qualitative properties, Quantitative properties

1. Introduction

Free-range chickens are native Indonesian chickens that still have native genes with high genetic variation, which indicates the potential for genetic improvement. Free-range chicken is a bird that is widespread throughout Indonesia and is popular with many people. The advantages of native chicken include resistance to stress and disease, maintenance, and the provision of food that is more comfortable and cheaper. The weakness of native chicken is low productivity, both from egg and meat production and slow breeding compared to other poultry.

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Identification and characterization of specific traits in livestock are one of the efforts to preserve genetic diversity to maintain the characteristics of animals. Identification and characterization of livestock phenotypic traits include qualitative and quantitative components. Determining a nation of chickens can be used qualitatively because these traits are primarily governed by genotype, while environmental factors play a minimal role [1].

Quantitative traits are traits that can be measured based on the morphological size of the livestock body, which is used as a basis and basis for determining the diversity of morphological body sizes that will be passed on to the next generation. Qualitative and quantitative traits of native chickens can be used as primary data for the preservation of genetic resources and the need for Indonesian germplasm collection [2].

The population of native chicken in North Kolaka Regency in 2017 was 514,418 tails spread in each district with different population numbers. Lasusua Sub district is one of the areas with the highest population of native chicken, which is 45,690 individuals [3].

One way to increase the productivity of native chickens is to improve the genetic quality both by selection and cross-breeding, commonly referred to as breeding programs. The diversity of genetic traits that include qualitative and quantitative characteristics is essential in the breeding program as a selection target. Based on the above background, it is deemed necessary to conduct a study of the qualitative and quantitative characteristics of native chickens in North Kolaka District.

2. Materials and Methods

This research was conducted in December 2018 until January 2019 in Lasusua Subdistrict, North Kolaka Regency. The materials used in this study are native chickens with a range of chicken age of 6 months to 2 years. The tools used in this study include measuring tape, scales, slide calipers, stationery, and cameras.

The population used in this study were native chickens found in Lasusua Subdistrict, North Kolaka Regency, with 45,690 heads. The sample of this study was male and female native chicken that had reached the adult body and was in production with a range of about six months to 2 years that were extensively maintained by farmers. The number of samples was determined using the Slovin formula (2012):

$$n = \frac{N}{1 + N\,(e)^2} \quad (1)$$

Information:
n = Number of Samples
N = Number of population
e = Error Level (5%)

So that the number of native chicken samples as many as 400 tails. The research location was determined by purposive sampling, namely Lasusua Subdistrict, North Kolaka District, with the consideration that the research location was one of the Districts that had the most native chicken population. The selection of sample villages was determined in four communities, namely in Totallang Village, Puncak Monapa, Rante Limbong, and Ponggiha Village, with a distribution of 100 village samples consisting of 50 males and 50 females.

3. Results and Discussion

3.1. Qualitative Properties of Kampung Chickens

Some economic qualities that are economically valuable are the color of the feathers, the pattern of the feathers, the design of the feathers, the flickering of the feathers, the color of the shank, and the shape of the comb. The results of the study of the quantitative characteristics of native chickens in Lasusua Subdistrict, North Kolaka Regency, are presented in Table 1.

Table 1. Characteristics of Qualitative Characteristics of Kampung Chickens in Lasusua Subdistrict, North Kolaka Regency (%)

Phenotype	Genotype	Gender			
		Male N = 200		Female N = 200	
Fur color					
Colored	Ii	194	97,00%	192	96,00%
Plain white	I	6	3,00%	8	4,00%
Feather pattern					
Wild	e+-	161	80,50%	126	63,00%
Columbian	Ee	26	13,00%	34	17,00%
Black	E-	13	6,50%	40	20,0%
Pattern of fur					
Striated	B-	174	87,00%	164	82,00%
Plain	Bb	26	13,00%	36	18,00%
Flickering feathers					
Silver	S-	35	17,50%	35	17,50%
Gold	Ss	177	88,50%	165	82,50%
Shank color					
White/yellow	Id-	131	65,50%	100	50,00%
Black/gray	Idid	69	34,50%	100	50,00%
The shape of the comb					
Pease (pea)	rrP_	25	12,50%	84	42,00%
Single (sebilah)	Rrpp	148	74,00%	71	35,50%
Rose	R_pp	27	13,50%	45	22,50%

3.2. Fur Color

Free-range chickens in Lasusua District have two categories of feather colors, which are colored and not colored. Free-range chickens with colored feathers are determined if a color other than white is found on the surface of the feathers throughout the chicken's body. In contrast, non-colored feather categories are assessed if the entire surface of the chicken feathers is white.

Table 1 shows that the percentage of the color of native chicken feathers with the color category of 194 chickens (97.00%) and 192 chickens (96.00%). At the same time, the understandable white feather color categories for male and female chickens were lower by six tails (3.00%) and eight tails (4.00%), respectively.

The high expression of colored feathers in native chickens is influenced by genes (i), where gene expression (i) native chickens in the research location of Lasusua District are expressed in black, brown, reddish brown and golden brown. This is following

the opinion expressed by Nishida et al. [4] that the color of chicken feathers can be used as a reference for the consistency of controlling the external characteristic gene in native chickens (i). Moreover, the cause of colored feathers in native chickens in Lasusua District is thought to be influenced by the presence of foreign genes that enter to improve the performance of existing local chickens. 3.3. Feather pattern

Black, wild and Colombian types are patterns that distinguish colors in chicken feathers [5]. The distribution of melanin in primary feathers will cause a feather pattern called the central fur color pattern. This color pattern is influenced by the delivery and inhibiting factors of eumelanin distribution. The distribution factor of eumelanin is that the E locus consists of three alleles, namely E (plain black), e + (wild type), and e (Colombian).

Table 1 shows that the percentage of wild feather patterns in male native chickens was predominantly 161 heads (80.50%) compared to Columbian feather patterns and black feather patterns with 26 tails (13.00%) and 13 tails (6.50%). Likewise, the feather pattern in hens is dominated by wild feather patterns of 126 birds (63.00%) compared to Columbian feather patterns and black feather patterns with 34 heads (17.00%) and 40 heads (20.00%), respectively.

The pattern of wild feathers on native chickens at the study site in Lasusua District is thought to be influenced by the existence of cross-breeding between local native chickens that have been domesticated with jungle fowls in Lasusua District. This is possible because of the geographical and natural conditions at the study site that are suitable as a place for live partridge.

Based on the results of this study that the pattern of native chicken feathers in Lasusua District has similarities with red jungle fowl. Meanwhile, according to Nataamijaya [6], that one of the main factors that determine the process of identifying the shape and size of the body, the shape of the comb (comb), and the color of the foot scales is a qualitative characteristic.

3.3. Pattern of Fur

Patterns of chicken feathers are distinguished by patterns of striated feathers and plain feathers. Striated hair pattern is determined if there is a combination of more than one color in one feather. The color pattern of plain feathers is determined if there is only one color in the feathers [5].

Table 1 shows that the percentage of feather patterns in males is striated at 87.00% and plain feather patterns of 13.00%. The interest of fur patterns in females is striated by 82.00% and plain feather patterns 18.00%. There are two types of feather patterns in chickens, namely barred, which is symbolized by gene B and non-barred expressed by gene b. The gene that carries the trait of this fur is adrift. The work of this B gene is to inhibit melanin deposition and will cause lines in the primary black color so that the feathers appear black with white stripes [7].

The results of this study are higher than those of Amlia et al. [8]. They reported that native chickens in Lasalimu Subdistrict have striated and plain feather patterns with a frequency of 79.00% and 21.00% phenotypes. Andrianto [9] phenotype frequency of plain feather pattern (bb) in male and female laughter chickens in Kendari City was higher than in the striated feather pattern (B-). In male laughter, the frequency of plain

feathers reaches 88% and striated feathers 12%. Whereas in hens, the rate of plain feathers was 76%, and striated feathers were only 24%.

3.4. Flickering Feathers

Color flickering on the main feather layer is called feather flicker, which consists of silver flakes (the S gene denotes silver and) and gold (symbolized by the s gene). Flickering feathers are found in chickens, both plain black feathers and white feathers. Still, they are less visible in chickens that have an autosomal red gene or that have feathers with a very sophisticated color combination. Gene carrier nature of this feather flicker is found on the sex chromosomes [7].

The frequency of phenotypic flickering of native chicken feathers in this study is almost uniform. This can be seen in Table 5, namely the spectrum of golden feather flicker phenotypes of 88.50% for males and 82.50% for females, while the phenotype of silver feather flickering frequencies of 17.50% for males and females. The results of this study are similar from of Amlia et al. [8]. They reported that native chickens in Lasalimu Subdistrict had gold and silver feather flips with a phenotype frequency of 96.00% and 4.00%. Sartika et al. [10], stated that native chicken had the highest percentage of feather flips is golden feather flips with a rate of 73.12%. This is different from the results of Kusuma's [11] research that the highest phenotypic percentage of feather flips in native chickens was silver feather flakes of 69.81%.

3.5. Shank Color

The yellow color in the native chicken shank is caused by the expression of the dominant Id gene, which inhibits melanin deposition in the skin shank dermis. This was also confirmed by Jull [12], who stated that yellow or white shanks in native chickens did not have melanin pigment in the dermis because they contained the Id gene, which prevents the storage of melanin in the epidermis. Hutt [13] stated that besides the Id allele, other alleles affect the color of the skin and shank color. The allele is the W allele, which carries the nature of carotenoid pigmentation in the form of xanthophyll. Chickens that have a yellow shank color may also have a yellow skin color. Therefore it is suspected that the yellow shank chicken like native chickens has the genotype e + e + wwIdId. The color of shanks in native chickens in Lasusua District has whiteyellow and blackgray legs.

Table 1 shows that the color percentage of white/yellow shank (Id-) is 65.50% for males and 50.00% for females, while the rate of shank black/gray colors (I did) is 34.50% for males and 50 .00% for females. This result is following Yulianti's [14] research that the highest frequency control gene for shank color in native chickens is yellow-white (Id-) of 0.8618, with a percentage of 85.00% for males and 68.00% for females.

The results showed that in native chickens, there were also black/gray shank colors with a phenotype frequency of 34.50% for males and 50.00% for females. The black shank is caused by the presence of melanin pigment in the epidermis. Specific feathering genes influence the black/gray shank color in native chickens. The feather gene is the E. chicken genus, which has black/gray shank genotype id and has the E. gene. It is reported by Jull [12] that the feather color gene is an E gene that tends to expand melanin pigmentation in the shank.

According to Dunn [15] explained that the dominant gene Id is not thoroughly dominant, this is seen in heterozygous individuals who turn out to have quite a lot of melanin spots on the surface of the skin so that the color of the shank looks not black but gray. The melanin pigment deposition level strongly influences shank color, the blacker the shank color, the more melanin pigment deposited in the dermis layer, and the shank color also reflects the skin color of chicken meat [16].

3.6. The Shape of the Comb

The shape of the native chicken comb in the results of this study consisted of 3, namely the form of a single comb, peas (Pea), and Rose (Rose). The type of rose and pea is dominant in a particular way. Chickens with rose and pea forms when crossed will produce offspring in the form of walnut combs [17].

Table 1 shows that the percentage of native chicken Capri's comb shape is 12.50% for males and 42.00% for females, the single comb form is 74.00% for males and 35.50% for females, while the percentage of rose comb forms is 13, 50% for males and 50.00% for females.

The shape of the native chicken's comb from the results of this study is not much different from the characteristics of the red jungle fowl (Gallus gallus), which is the ancestor of some of the existing chicken poultry which has a single comb shape. The shape of the comb on native chickens with red jungle fowls that became ancestors of native chickens is thought to be caused by the influence of the single comb genes [4].

Rusdin et al. [18], States in their study that the qualitative nature of the comb shape were quite diverse, consisting of rose, Capri (pea) and single (single). Of the three types of this comb, more peas are found, namely 65.85% in males and 84.81% in females.

3.7. Quantitative Nature of Kampung Chickens

Some quantitative traits that have economic value are bodyweight, femur length, calf-length (tibia), claw length (shank, tarsometatarsus), chest circumference, and back length. These properties can be used as growth parameters. The results of research on the quantitative characteristics of native chickens in Lasusua Subdistrict, North Kolaka Regency, are presented in Table 2.

3.8. Body Weight

Table 2 shows that the average body weight for male native chickens was 1,681.92 ± 342.76 grams, with the coefficient of diversity (HH) being 20.38% while in female native chickens, an average of 1,305.45 ± 410.93 grams was obtained with KK is 31.48%. When compared with the results of research conducted by Misnawati [19], the results of this study did not differ much, wherein the Misnawati study obtained an average body weight of 1,635.98 grams of male native chicken with KK was 20.27% while in females the average gained the average body weight of 1,176.45 grams with KK is 19.65%, the results of this study were 46 grams higher in males and 129 grams in females.

Rajab et al. [20] reported the average body weight of native chicken aged >20 weeks in male and female eggs was 1,708.68 grams and 1,611.47 grams, so the results of this study were 0.05 lower for males and 0.4 higher in females. According to Susanti et al. [21] stated that the average body weight of warning chicken 1007.6 grams with KK

13.5% while in females 841.1 grams with KK 14.5%. Susanti et al. [21] also stated that the weight characteristics of warning chickens were smaller compared to other local chickens. When compared to the KK results obtained, the results of the research I did were more uniform than those of Susanti et al. [21] because it has a smaller KK value.

Table 2. Characteristics of Quantitative Nature of Kampung Chicks in Lasusua Subdistrict, North Kolaka Regency

Parameter	Male (N=200)		Female (N=200)	
	Average	KK (%)	Average	KK (%)
Body Weight (g)	1681,92±342,76	20,38	1305,45±410,93	31,48
Shank Length (cm)	9,97±1,48	14,84	8,34±1,25	14,96
Femur Length (cm)	13,07±1,71	13,10	11,87±1,19	10,01
Tibia Length (cm)	9,70±1,38	14,26	9,37±1,02	10,84
Wing Length (cm)	14,44±2,03	14,05	12,49±1,54	12,30
Chest Circumference (cm)	30,50±4,02	13,19	29,59±1,76	5,96
Back Length (cm)	14,17±1,52	10,73	12,23±0,92	7,49
Beak Length (cm)	1,96±0,29	14,08	1,94±0,29	14,92

N: Sample, KK: Coefficient of diversity

3.9. Long Shank

Based on the results of the study in Table 2, the average length of shank for male chickens was 9.97 ± 1.48 cm with a KK of 14.84%, while in a native chicken, there was 8.34 ± 1.25 cm with a KK of 14.96 %. When compared with the results of Subekti et al. [22] research, where the average length of shanks of native male chickens was 10.36 cm and females 8.10 cm, the results of this study were 0.39 cm lower in males and 0.24 cm in females. Subekti et al. [22] reported that the average shank length for male native chickens was 103.60 mm and 81.07 mm when converted to cm units, 10.37 cm was obtained in males and 8.10 cm in females. When compared with the results of Rajab et al. [20] research, the results are not much different.

Genetic and environmental factors cause differences in the results of this study. This is consistent with the opinion of Warwick et al. [23], which states that the appearance of a trait depends on the genes owned by livestock. Still, the supporting environmental conditions are needed to provide the opportunity for the presence of a character in full. Variations in body size of native chickens can be caused by the environmental conditions of different seedlings, different maintenance environments and the influence of climate [24].

3.10. Long Femur

Based on the results of the study in Table 2, the average length of femurs for native chickens raised in Lasusua District is 13.07 ± 1.71 cm with KK 13.10% in male cattle and 11.87 ± 1.19 cm with KK 10, 01% in female animals. When compared with the results of the research of Candrawati [25], the results of this study has similar results. The average length of femur chickens for male cattle was 10.23 ± 0.65 cm, whereas in female native chickens was 8.35 ± 0.38 cm. According to Rajab et al. [20], the average length of femurs for male native chickens was 99.56 ± 7.60 mm while in female native chickens was 89.18 ± 4.37 mm. In the research of Subekti et al. [22], the average length of the femur in male and female native chickens was 109.24 ± 9.19 mm and 95.39 ± 11.59 mm.

3.11. Long Tibia

Based on the results of the study in Table 2, the average length of the tibia for native chickens raised in Lasusua District was 9.70 ± 1.38 cm with KK 14.26% for males and 9.37 ± 1.02 cm with KK 10, 48% for females. When compared with the results of a study conducted by Kuswardani [26], the results of this study has similar results, wherein his review the average length of the tibia of native chicken in male cattle was 14.30 ± 18.61 cm with KK 13.01% while in female animals was 11.62 ± 13.52 cm with KK 11.62%, the results of this study were 4.6 cm lower for males and 2.25 cm for females.

Based on the results of Candrawati's [25] research, the average length of the tibia of male and female native chickens was 15.40 ± 1.20 cm and 12.31 ± 0.59 cm. According to Subekti et al. [22], the average length of the tibia of male native chicken is 144.48 ± 15.68 mm, and female is 125.34 ± 9.2 mm. The average length of the tibia for native chickens in traditional rearing was 142.17 ± 10.71 mm in male cattle and 127.36 ± 5.55 mm in female animals [20].

3.12. Wingspan Length

Based on the results of the study in Table 2, the average back length for native chickens raised in Lasusua District is 14.44 ± 2.03 cm, with a KK of 14.05% in male cattle and 12.49 ± 1.54 cm with a KK of 12. , 30% in female animals. When compared with the results of Misnawati's [19] research, the average length of free-range chicken wings for male cattle is 20.64 cm, while in native chicken is 18.66 cm. Likewise, in Subekti et al. [22] research, the average wing length of male and female native chickens was 218.41 ± 14.47 mm and 188.65 ± 4.84 mm.

3.13. Chest size

Based on the results of the study in Table 2, the average chest circumference for male native chickens is 30.50 ± 4.02 cm with a KK of 13.19% while in a native chicken is 29.59 ± 1.76 cm with a KK of 5.96 %. When compared with the results of the study of Susanti et al. [21], the results of this study are quite different where the average warming chicken breast circumference for adult male cattle is 25.1 ± 2.2 cm and KK 8.8%, while for female animals it is found an average of 23.5 ± 1.9 cm and KK 8.1%. Kurnia [27] states that the average chest circumference for 12-week-old native chickens in males is 21.23 ± 1.70 cm with KK is 5.5% while in females, it is 20.39 ± 1.60 cm with KK is 5, 5%.

Based on the KK values obtained, it can be seen that the results of the study have smaller KK values. This indicates that the results of my research are more uniform when compared with the results of the survey of Susanti et al. [21] and Kurnia [27]. According to Diwyanto [28] stated that each component of the body had a different rate of growth or development due to genetic and environmental influences.

3.14. Back Length

Based on the results of the study in Table 2, the average back length for native chickens raised in Lasususa Sub-District is 14.17 ± 1.52 cm with KK 10.73% for males and 12.23 ± 0.92 cm with KK 7, 49% for females. Based on the results of research Kusuma [11] obtained an average of 11 weeks old native chicken of 12.70 ± 0.87 cm in male cattle and 12.32 ± 0.86 cm for female animals. When compared with the results of this study, the average length of native chicken backs in Kusuma's research results

is lower. This is due to differences in chicken age, where the chicken samples in this study were older than six months or 24 weeks while in the survey, Kusuma [11] was 11 weeks old.

According to Susanti et al. [21] found the average back length of males wearing chickens was 15.5 ± 1.7 cm with KK was 11.0%, and in females wearing chickens, it was 13.4 ± 1.0 cm with KK was 7.5%. Based on the results of Kusuma's [11] research, the average age of 11 weeks of merawang chicken was 12.77 ± 0.82 cm in male cattle and 11.81 ± 0.99 cm in female animals. From the three types of chicken above, it can be seen that the highest average back length is a wareng chicken.

3.15. Half-length

Based on the results of the study in Table 2, the average half-life for male native chickens is 1.96 ± 0.29 cm, with a coefficient of diversity (KK) of 14.08%. In comparison, in native chickens, an average of 1.94 ± 0.29 cm, with a ratio of difference (KK) is 14.92%. When compared with the results of Misnawati's [19] research, the results of this study are not much different where the average half-length for male native chickens is 1.83 cm with KK is 13.85% while in native chickens an average of 1.69 cm is obtained with KK is 13.83%.

Suparyanto et al. [29], beak size has an essential function for poultry in the ability to scramble available feed. The higher the half-life, the opportunity to take food will be more and more, while the length of the half-life will affect in reaching food that is blocked. According to Fayeye et al. [30] that the difference in phenotypic appearance in chickens is due to genetic factors but also due to environmental influences. The differences found in the quantitative nature of native chickens are caused by genetic and environmental factors [22].

4. Conclusion

Based on the results, it can be concluded that native chickens in Lasusua Subdistrict, North Kolaka District, both male, and female are dominated by colored feathers, Columbian feather patterns, striated feather patterns, and flickering golden feathers. White/yellow shank color and single comb shape. The average body weight of male native chicken is 1,681.92 grams, and the female is 1,305.45 grams. The length of the chicken shank is 9.97 cm, while the female is 8.34 cm. The length of the tibia is 9.70 cm in males, 9.37 cm in females. The length of the femur is 13.07 cm in males and 11.87 cm in females. The length of the range of male chicken wings is 14.44 cm and 12.49 cm female. Male breast circumference 30.50 cm and females 29.59 cm. The male back length is 14.17 cm, and the female is 12.23 cm. Lung length in males is 1.96 cm and 1.94 cm in females.

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