



Phenotype Variety of West Sumatera's Germplasm Randah Batu Kokok Balenggek Chicken

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Abstract | Kokok Balenggek chicken is a local Indonesian originating from Payung Sakaki Subdistrict (Tigo Lurah), Solok Regency, West Sumatera Province. They are grouped into three categories: (1) Yungkilok Gadang chicken, (2) Ratiah chicken and (3) Batu chicken. This study aims to identify the phenotypes variety of the Randah Batu Kokok Balenggek chicken reared by its farmers in Solok Regency, West Sumatra. There 60 Randah Batu Kokok Balenggek chickens were sexually mature. This study used a survey method, and sampling was carried out using purposive sampling. The parameters observed were qualitative and quantitative phenotypes. The data obtained were analyzed by descriptive statistical analysis. The results showed that the qualitative variety of the Randah Batu Kokok Balenggek chicken reared by the Kokok Balenggek chicken Farmers in Solok Regency, West Sumatra, based on the Biriang color of 48.33%, the yellow/white color of the beak and shank of 96.67%, and Rantak Gumarang crowing type of 75%, the sound level ranges from 3-7 with an average of 4.63 ± 1.49 . Meanwhile, the high variation in quantitative characteristics was the diameter of the shank 16.53%, the number of crow 32.27% and the number of comb points 19.82%. The conclusion of this research is that the phenotypes of Randah Batu Kokok Balenggek chickens still variability. It is advisable to maintain the AKB Taduang type, and selection can be carried out based on shank diameter and the number of crowing.

Keywords | Kokok Balenggek chicken, Randah Batu, Biriang, Phenotype, Variety

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INTRODUCTION

Indonesia is a country rich in germplasm sources, both animals and plants. Chicken is one of the sources of animal germplasm that is widely found in Indonesia. There are 39 strains of chicken that are known and spread throughout Indonesia. The genetic potential of the chicken is widely used as a producer of eggs and meat and as an ornamental chicken, fighting chicken, and singing chicken. From one type of singing chicken in Indonesia, there is one type of chicken called the Kokok Balenggek chicken (Rusfidra and Arlina, 2014).

Decree of the Minister of Agriculture No. 2919/Kpts/OT.140/6/2011 states that: Kokok Balenggek chicken is one of the Indonesian local chicken groups that has a consistent physical form and genetic composition as well as the ability to adapt well to environmental limitations. These chickens have different characteristics from native chickens or other local chickens and are a wealth of local Indonesian livestock genetic resources that must be protected and preserved. Arlina *et al.* (2014, 2020) stated that Kokok Balenggek chicken are grouped into three categories, (1) Yungkilok Gadang chicken, (2) Ratiah chicken and (3) Randah Batu chicken. The Yungkilok

Gadang chicken has a well-built, dashing, and beautiful appearance. Adult roosters weigh 2 kg while females weigh 1.5 kg. The Ratiah chicken looks smaller and slimmer; the adult male Ratiah chicken weighs 1.6 kg, and the female is 0.8 kg. In contrast, the Randah Batu chicken looks like the Kate chicken because it has short legs. The leg length is between 3 and 4 cm, so the body looks short and low. Adult male chickens weigh 1.8 kg, and 1 kg of females.

One of the types of Kokok Balenggek chicken is the Randah Batu chicken which has a distinctive feature of low or short legs. Based on observations in the field that several types of Kokok Balenggek chickens are rare to be found. In 2000, breeders began to develop the Kokok Balenggek Randah Batu chicken, and these chickens began to be recognized by the public so the Kokok Balenggek chicken farmers in West Sumatra began to be interested in maintaining and re-developing one of these chickens.

Identification and characterization of the unique traits of livestock is an effort to preserve genetic diversity to maintain the unique characteristics of the livestock. Determining and characterizing livestock phenotypic traits include qualitative and quantitative traits (Arlina *et al.*, 2014). *Quantitative traits* can be measured based on the body morphology of livestock, which serve as the basis for determining the diversity of body morphology sizes that will be passed on to the next generation. Characterization of native livestock can be done in several ways, namely phenotypic description, genetic evaluation, DNA fingerprinting, and karyotypes (Khumnirdetch, 2002). Identification and characterization are the initial requirements for characterizing and utilizing genetic resources (Weigend and Romanoff, 2001). This study aims

to identify the diversity of appearance of the Randah Batu Kokok Balenggek Chicken in the Lovers and Observers farmers of the Kokok Balenggek chicken, West Sumatera.

MATERIALS AND METHODS

Total 26 respondents used in this study was KBC farmers in the in-situ area of Nagari Batu Bajaran, Tigo Lurah District, Solok Regency. The method used was survey method. The sampling was used purposive sampling. There were 60 of Randah Batu Kokok Balenggek rooster reared intensively by the farmers in Solok Regency, West Sumatera. The method used was survey method. The sampling was used purposive sampling. The variables were of the qualitative and quantitative characteristics of the Randah Batu Kokok Balenggek chicken.

Variables qualitative characteristics were the types of KBC based on the color of the feathers, according to *Arlina et al (2020)* The song types of Randah Batu Kokok Balenggek Rooster were divided in to seven types of Kukuak Balenggek rooster, as follows *Ginyang, Rantak Gumarang, Gayuang luluah, Sigegek angin, Riak ilia aia, Alang babega, Ginyang mataci*: The sound issued is like being directed down (rhythmically). The variety variety on base shank and beak color were identified based on *Somes (1988)*.

Quantitative characteristics were calculated by the FAO guidelines for animal genetic resource char), and *Putri et al. (2020)* quantitative measurements (body weight, comb height, body length, neck length, wing length, number of primary length, length of femur, shank circumference, third finger length) (*Table 1*).

Table 1: Quantitative measurements definition and description of measuring devices used to characterize chicken populations. Adapted from FAO (2012) and Putri *et al.* (2020).

No.	Linear traits	Definition of quantitative morphological variables	Unit	Measuring device
1	Body weight	Live body weight	g	Digital balance
2	Comb height	Taken from the base of the comb to the highest end of the comb.	cm	Measuring Tape
3	Beak length			
4	Neck Length	Taken from the neck near the head to the base of the neck near the chest.	cm	Measuring tape
5	Wing length	Length between tips of right and left wings after both are stretched out in full	cm	Measuring tape
6	Number of primary length	The number of feathers found on the tip of the wing.	cm	Measuring tape
7	Femur length	Taken from the joint that connects the hip bone with the femur to the joint that connects the femur with the tibia.	cm	Measuring tape
8	Tibia length	Taken from the patella to the tip of tibia	cm	Measuring tape
9	Shank length	Length of the shank from the hock joint to the spur of either leg	cm	Measuring tape
10	Shank circumference	Taken at the middle of the shank of either leg	cm	Measuring tape
11	Third finger length	Measured from the phalanges to the fingertips.	cm	Measuring tape
12	Number of crow	The number of Crow is the number of Kokok lenggek syllables in chickens	level	Cool edit pro

The data were analyzed using descriptive statistics by calculating the mean, standard deviation and coefficient of variance (Kurnianto, 2009). Data entry and management were performed using Microsoft Excel© worksheets. Analysis of the quantitative measurements was carried out separately for both sexes. Kukuak Balenggek chicken crowing sounds are recorded using azoom h2naudio recorder. The computer program used in Cool Record Edit Pro, this software can be used in the sound analysis (sound visualization), printing (sound printing), sound illustration (spectrogram), sound waveforms (waveform), time measurement, and frequency of crowing. Data entry and management were performed using Microsoft Excel© worksheets. Analysis of the quantitative measurements was carried out separately for both sexes.

RESULTS AND DISCUSSION

PROFILE OF BREEDERS WHO RAISE THE RANDAH BATU KOKOK BALENGGEK CHICKEN

Profile of Randah Batu Kokok Balenggek chicken breeders based on age, education, length of breeding, and occupation can be seen in Table 2.

Based on Table 2, the number of breeders of the Kokok Balenggek chicken in the Kokok Balenggek Chicken farmers is 26 breeders. The age of most breeders is above 50 years, 46.15%. The highest level of education is high school, total 12 people 46.15%. This shows that the education of the breeders in the Association of Crowing Chicken Balenggek in Solok Regency, West Sumatra is relatively high. According to Dorian and Istina (2009), a person's level of education can affect attitudes and abilities in absorbing technological innovations. A high or low level of education will affect the way of thinking and how to solve problems. The work of breeders varied as traders 34.61%, private sector 19.24%, civil servants and farmers 15.38%. as many as four people 12.50%. In comparison, the most extended breeding season was <5 years, 53.85%, which shows the number of new breeders/hobbyists who develop Randah Batu Kokok Balenggek chickens. Mastuti and Hidayat (2008) stated that the longer the farming time, the more knowledge is expected to be obtained to increase the skills in running a livestock business.

REARING SYSTEM

The results showed that the Kokok Balenggek chicken rearing system of the Kokok Balenggek farmers in Solok Regency, West Sumatra was carried out only intensively. This was because the chickens were in the development period, their numbers were still relatively small, and also, the height of the chicken legs was low. It makes it difficult to avoid being chased by predators, so breeders use more intensive maintenance systems to secure Randah Batu

chicken development. The feed given by the breeders to adult male Kokok Balenggek chickens (KBC) that are already crowing in the KBC farmers varies. Some provide a mixture (rice, grain, corn), and others provide (rice and 511 Comfeed). Moreover, some only give rice. To improve the performance of KBC, the KBC farmers also provides additional natural supplements in the form of tomatoes, honey, ginger, eggs, and vegetables. However, most association breeders provide tomatoes as an additional supplement to improve the performance, (Arlina *et al.*, 2015) stated that for roosters with a crowing story, breeders usually provide rice food and tomatoes and chilies, which aim to make the sound of the crowing of the chickens better and more awake.

Table 2: Breeder Profile of Randah Batu Kokok Balenggek chicken based on age, education, occupation and length of breeding.

No	Variable	Number of breeders (people)	Percent-age (%)
1	Age (year)		
	30-39	5	19.24
	40-49	9	34.61
	>50	12	46.15
	Total	26	100
2	Education		
	Elementary School	2	7.69
	Junior High School	7	26.92
	Senior High School	12	46.15
	Tertiary	5	19.24
	Total	26	100
3	Occupation		
	Farmer	4	15.38
	Private sector	5	19.24
	Trader	9	34.61
	Workman	1	3.84
	Civil servant	5	19.24
	Others	2	7.69
	Total	26	100
4	length of breeding (year)		
	<5	14	53.85
	6-10	6	23.07
	10-15	3	11.54
	>16	3	11.54
	Total	26	100

QUALITATIVE CHARACTERISTICS OF RANDAH BATU KOKOK BALENGGEK CHICKEN

TYPES OF RANDAH BATU BASED ON FEATHER COLOR

The results of observations on the type of Randah Batu

chicken based on the feathers color in Solok Regency West Sumatra are presented in Table 3.

Table 3: Qualitative characteristics of the feather color of the Kokok Balenggek chicken farmers, West Sumatra.

Chicken type	Total	Percentage (%)
Biriang/reddish	29	48.33
Taduang/blackish	1	1.67
Jalak/greenish yellow	13	21.67
Kinantan/white	5	8.33
Kuriak/stripes/spots	12	20
Total	60	100

This is in line with the findings of Arlina *et al.* (2014, 2020), Rusfidra *et al.* (2014), where the feather color of the Balenggek Crowing Chicken commonly found is red. Meanwhile, the qualitative traits on Kokok Balenggek chicken were Taduang (4.76%), and Biriang (57.15%), Biriang pucek (14.29%), Biriang kuniang (19.05%), Rusfidra *et al.* (2014).

BEAK AND SHANK COLOR

The results of observations on the qualitative characteristics of the color of the beak and shank of the Batu Kokok Balenggek hicken are presented in Table 4.

Table 4: Qualitative characteristics of beak and shank color of the Ranah Batu Kokok Balenggek chicken at the Kokok Balenggek chicken farmers, West Sumatra.

Beak and leg/Shank color	Total (n)	Percentage (%)
Yellow/white	58	96.67
Black	2	3.33
Total	60	100

In Table 3, it can be seen that the Randah Batu Kokok Balenggek chicken reared in the Association of of Balenggek Balenggek, West Sumatra, has a dominant yellow/white beak and shank color, which is 96.67%. In comparison, the black beak and shank color only have a percentage of 3.33%. Variations in shank color, such as gray-green, black, white, green, black-white, and black-yellow green as observed in this study are similar to the variants observed in Black Kedu chickens (Johari *et al.*, 2009) and Maharani *et al.* (2021) indigeneous chicken and Dahloum *et al.* (2016) Sri Lanka chickens. Faruque *et al.* (2010) detected wide variations in shank color in Bangladeshi chickens. They were white, yellow, black, and greenish. Asmara *et al.* (2019) observed black shank as being the most frequent in female Pelung chickens, which is in contrast to our findings. Variations in shank color are primarily affected by the nutrition of feed sources containing carotene (Negassa *et al.*, 2014). The most dominant color of the shank is yellow. According to Hutt (1949), the yellow/white color is controlled by the dominant gene Id. The characteristic yellow or white shank

color is caused by a lack of melanin content in the outer layer controlled by a recessive gene characterized by black shank color.

CROWING SOUND TYPE OF RANDAH BATU KOKOK BALENGGEK CHICKEN

Based on the study results, the number of Randah Batu chickens based on the type of crowing sound of Balenggek chickens in the Kokok Balenggek chicken farmers, West Sumatra, can be seen in Table 5.

Table 5: The Randah Batu Kokok Balenggek crowing sound types reared at the West Sumatra Kokok Belenggek chicken farmers.

No	Crowing sound type	Total (chicken)	Percentage (%)
1	Rantak Gumarang	45	75
2	Sigegek Angin	7	11.67
3	Ginyang	8	13.33
	Total	60	100

Based on Table 4 it can be seen that the number of Randah Batu Kokok Balenggek Chickens in the Association of Kokok Balenggek Lovers of West Sumatra based on the sound type Rantak Gumarang is 45 individuals with a percentage of 75%, Sigegek Angin is seven individuals with a percentage of 11.67%, Ginyang 8 individuals with a percentage of 13.33%. The results of this study indicate the most common type of Rantak Gumarang sound. According to observers of the Kokok Balenggek chicken, this is due to the primary lineage of the Kokok Balenggek chicken in this Association. Most chickens have the sound type of Rantak Gumarang, so the descendants of Rantak Gumarang are the most widely spread in the West Sumatra Kokok Balenggek Chicken Farmers (Arlina *et al.*, 2020).

QUANTITATIVE CHARACTERISTICS OF RANDAH BATU KOKOK BALENGGEK CHICKEN

Based on the study's results, the mean, standard deviation, and coefficient of the quantitative characteristics of the Randah Batu Kokok Balenggek chicken are in Table 6.

In Table 6, it is known that the average body weight of the Randah Batu Kokok Balenggek chicken, West Sumatra, is 1.48 ± 0.14 , and the coefficient of variance was 9.23% which is classified as moderate (Kurnianto, 2009). When compared with Arlina *et al.* (2015), his research stated that the average body weight of Kokok Balenggek Chicken was 1.53 kg, so the results of this study were 0.05 kg lower. This difference is due to the number of samples and different environmental conditions. This is the opinion of Warwick *et al.* (1995) that genetic and environmental variations cause variation in an individual.

The average comb height of the Kokok Balenggek chicken

in the Kokok Balenggek Association of West Sumatra is 5.73 ± 0.37 with a coefficient of variance of 6.52% which is classified as moderate (Kurnianto, 2009). Compared with the results of Rusfidra *et al.* (2014), the average comb height in male Balenggek crowing chickens was 3.585 cm, so the results of this study were 2.145 cm higher in males. This difference is caused by the difference in the number of samples and the age factor, and the management of the maintenance system applied to the Balenggek Crowing Chicken is not the same.

Table 6: Mean, standard deviation, and coefecient of variation quantitative characteristics of the Randah Batu Kokok Balenggek chicken

No.	Variable	Mean	Coefecient of variation (%)
1	Body weight	1.48 ± 0.14	9.23
2	Comb height	5.73 ± 0.37	6.52
3	Beak length	3.6 ± 0.44	12.21
4	Neck length	10.77 ± 0.47	4.31
5	Wing length	15.68 ± 0.48	3.04
6	Number of primary wings	20.68 ± 0.62	3.02
7	Femur length	8.81 ± 0.47	5.34
8	Tibia length	10.49 ± 1.01	9.67
9	Tersometarsus length	3.88 ± 0.21	5.49
10	Diameter of shank	6.43 ± 1.06	16.53
11	Third fingers length	5.88 ± 0.36	6.19
12	Number of Crow	4.63 ± 1.49	32.27

The average beak length of the Randah Batu Kokok Balenggek chicken is 3.6 ± 0.44 , and the coefficient of variance is 12.21% which is moderate (Kurnianto, 2009). When compared with the results of Ahmad's Study (2015), the average beak length in Kokok Balenggek chicken was 2.49 ± 0.27 cm, so this study was 1.29 cm higher. The difference in the results of this study was due to differences in the number of samples and environmental conditions, and the type of genes in Kokok Balenggek chicken was not the same.

The average neck length of the Kokok Balenggek Chicken in the Farmers of Kokok Balenggek Chicken in West Sumatra is 10.77 ± 0.47 , and the coefficient of variation is 4.31%, which is relatively low (Kurnianto, 2009). Compared to the Kokok Balenggek in Ahmad's Study (2015), the average neck length of the male Kokok Balenggek is 12.53 ± 1.30 cm; this means that this study is 1.76 cm lower. This difference is due to differences in the number of samples and environmental conditions, and the type of genes in the Kokok Balenggek chicken is not the same. This follows the opinion of Warwick *et al.* (1995) that genetic and environmental variations cause the variation in an individual

The average wing length of the Kokok Balenggek chicken in the Association of West Sumatra is 15.68 ± 0.48 , and the coefficient of variation is 3.04%, which is low. Compared with Ahmad's Study (2015) results, the average wing length of the Kokok Balenggek chicken is 20.03 ± 1.93 cm. So that means research is over 4.35 cm. When the Randah Batu Kokok Balenggek Chicken is compared to the Kampung Chicken, Subekti and Arlina (2011) state that the average wing length of the Kampung Chicken is 218.41 mm, the results of this study are 6.161 cm lower. The difference in the results of this study was caused by the difference in the number of samples and the age factor, and the maintenance system management that was applied was not the same. This follows the opinion of Noor (2008) that the diversity of animal body size is caused by genetic factors and environmental factors.

The average number of primary wings of the Kokok Balenggek Chicken in the CAssociation of West Sumatra is 20.68 ± 0.62 with a coefficient of variance of 3.02%, which is relatively low (Kurnianto, 2009). Compared with Ahmad's Study (2015) results, the average number of primary wing feathers in male and female Kokok Balenggek chickens was 21.04 ± 3.08 strands, meaning this study was 0.36 strands lower. The difference in the results of this study was due to differences in the number of samples and environmental conditions, and the type of genes in Kokok Balenggek chickens were not the same. This follows the opinion of Warwick *et al.* (1995) that genetic and environmental variations cause variation in an individual.

The average femur length of the Randah Batu Kokok Balenggek chicken was 8.81 ± 0.47 , and the coefficient of variance was 5.34% which was classified as moderate. Compared with the results of Rusfidra's Study (2003), the average femur length in male Kokok Balenggek chicken was 9.187 cm, so the results of this study were 0.377 cm lower. Subekti and Arlina (2011) stated that the average femur length of free-range chickens was 109.24 mm, so the results of this study were 2.114 cm lower. The difference in the results of this study was caused by the difference in the number of samples and the age factor, and the maintenance system management applied to the Kokok Balenggek chicken was not the same. This follows the opinion of Noor (2008) that genetic and environmental variations cause variation in an individual.

The average tibia length of the Kokok Balenggek chicken in the Farmers of Kokok Balenggek Chicken of West Sumatra was 10.49 ± 1.01 , with the coefficient of the diversity of the Randah Batu Kokok Balenggek chicken being 9.67% which was classified as moderate (Kurnianto, 2009). Compared with the results of study Rusfidra (2004), the average tibia length in the male Kokok Balenggek

chicken was 11.055 cm, and the male Kampung Chicken was 14.917 cm. The male Red Junglefowl was 10.775 cm, so the results of this study were 0.565 cm lower in the Kokok Balenggek male, 4.427 cm lower in male free-range chicken, and 0.285 cm higher in red jungle fowl. Compared with the research results by Subekti and Arlina (2011), the average tibia length in male free-range chickens is 144.48 mm. The difference in the results of this study was caused by the difference in the number of samples, the age factor, and the maintenance system management applied to the Kokok Balenggek chicken.

The average tarsometatarsus length of the Kokok Balenggek chicken reared at the Kokok Balenggek Chicken, West Sumatra, was 3.88 ± 0.21 cm and the coefficient of variation was 5.49% which was classified as moderate. Compared with Arlina *et al.* (2014) results, the average tarsometatarsus length in the Kokok Balenggek chicken was 9.07 ± 1.06 cm, meaning this study was 5.19 cm lower. This is because the gene in the Kokok Balenggek chicken is heterozygous Cc, which means that the Randah Batu Kokok Balenggek chicken has a defect that shows the size of its short legs, which is called a redep (creeper). Compared with the results of research by Subekti and Arlina (2011), the average tarsometatarsus length in free-range chickens is 103.60 mm, so the results of this study are 6.48 cm lower. This follows the opinion of Noor (2000) that the differences that can be observed in livestock for various traits are caused by genetic and environmental factors.

The mean tarsometatarsus diameter of the Kokok Balenggek chicken in the Kokok Balenggek Chicken Lovers Association in West Sumatra was 6.43 ± 1.06 , and the coefficient of variance was 16.53%. The coefficient of the diversity of the tarsometatarsus diameter of the Randah Batu Kokok Balenggek is relatively high (Kurnianto, 2009). Variations were found on quantitative traits such as body weight, number of crow, shank diameter and neck length (Arlina *et al.*, 2015).

The average third finger length of the Kokok Balenggek Cockfighting Chicken in the Balenggek Cockfighting Association of West Sumatra is 5.88 ± 0.36 , with a coefficient of variation of 6.19% which is classified as moderate (Kurnianto, 2009). Compared to the results of research by Subekti and Arlina (2011), the average third finger length in free-range chicken is 73.20 mm, so the results of this study are 1.44 cm lower. The difference in the results of this study was caused by the difference in the number of samples and the age factor, and the maintenance system management that was applied was not the same. This follows the opinion of Warwick *et al.* (1995) that genetic and environmental variations cause variation in an individual.

THE NUMBER OF CROWING

Based on Table 5 it can be seen that the number of the long-range Lenggek of the Randah Batu Kokok Balenggek chicken kept at the Association of Kokok Balenggek West Sumatra ranges from 3-7 with an average of 4.63 ± 1.49 and a coefficient of variance of 32.27% with the high category (above 15%). The high coefficient of variation in the number of crows in the results of this research is due to the Kokok Balenggek Cockfighting Association of West Sumatra, which has various types of sounds. The different types of crowing sounds of the Randah Batu Kokok Balenggek affect the number of crowing steps, the number of crowing syllables, and the duration of the crow. The number of Lenggek Kokok in the study result was lower than the study of Rusfidra *et al.* (2015) which stated the number of crowing of the Kokok Balenggek chicken ranged from 5-11 crow with an average of 5.07 crow. the number of crowing based on the type of KBC sound was Sigegek Angin sound with an average of 9.48 crowing (Arlina *et al.*, 2020) Differences in the results of the sound characterization of Kokok Balenggek Chicken are caused by several factors, namely genetic factors, environmental factors, disease, maintenance and control systems (Arlina *et al.*, 2020).

CONCLUSIONS AND RECOMMENDATIONS

This study concludes that: Phenotype variety of Randah Batu Kokok Balenggek chicken reared by the Kokok Balenggek Chicken in Solok Regency, West Sumatera based on Qualitative characteristic, the most dominant feather color is Biriang which has a percentage of 48,33 %, and the lowest percentage is Taduang (1.67%). The beak and shank color are yellow/white with the percentage of 96,67% and black 3,33% and the highest proportion for the sound type is Rantak Gumarang (75%), followed by Ginyang 913.33%) and Sigegek Angin (11,67%). Quantitative characteristics of Kokok Balenggek chicken reared by the Kokok Balenggek Chicken in Solok Regency, West Sumatera based on which has the highest variety was the number of crowing (32,27%), Number of comb points (19,82%) and tarsometatarsus diameter (16,53%). The variety of the phenotypes of Randah Batu Kokok Balenggek chickens still variability. It is advisable to maintain the AKB Taduang type, and selection can be carried out based on shank diameter and the number of crowing.

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The authors found that qualitative and quantitative strates of Randa Batu Kokok Balenggek Chicken in reared by farmers in Solok Regency West Sumatra. The variety of the phenotypes of Randah Batu Kokok Balenggek chickens still variability.

AUTHOR'S CONTRIBUTION

All authors contributed equally.

CONFLICT OF INTEREST

The authors have declared no conflict of interest.

REFERENCES

- Abbas MdR (2015). Ayam Kokok Balenggek Ayam Penyanyi Sumatera Barat. Andalas University Press. Padang.
- Ahmad D (2015). Keragaman Sifat Kuantitatif Ayam Kokok Balenggek Yang dipelihara Secara Intensif Pada Kelompok Ternak "Kinantan Bagombak" Ampang Kualo Kota Solok. Skripsi. Fakultas Peternakan. Universitas Andalas. Padang.
- Arlina F (2015). Keragaman Fenotipe dan DNA Mikrosatelit Ayam Kokok Balenggek Untuk Strategi Awal Konservasi di Sumatera Barat. Program Pascasarjana Universitas Andalas Padang (Disertasi).
- Arlina F, Abbas MH, Anwar S, Jamsari (2014). Variability of external genetic characteristics of Kokok Balenggek chicken in West Sumatra Indonesia. *Int. J. Poult. Sci.*, 13(4): 185–190. <https://doi.org/10.3923/ijps.2014.185.190>
- Arlina F, Rusfidra D, Andriano, Sumantri C (2020). Short communication: The type and sound diversity of Kukuak Balenggek chicken (*Gallus gallus domesticus*) reared in West Sumatra, Indonesia. *Biodiv. J. Biol. Div.*, 21(5): 1914-1919. <https://doi.org/10.13057/biodiv/d210518>
- Arlina F, Abbas H, Anwar S, Jamsari (2015). Qualitative and quantitative traits of Kokok Balenggek Chicken, the rare indigeneous chicken in West Sumatra. The 6th International Seminar on Tropical Animal Production Integrated Approach in Developing Sustainable Tropical Animal Production October 20-22, 2015, Yogyakarta, Indonesia. <https://jurnal.ugm.ac.id/istaproceeding/index>
- Asmara IY, Garnida D, Tanwiriah W, Partasasmita R (2019). Qualitative morphological diversity of female pelung chickens in West Java, Indonesia. *Biodiversitas*, 20(1): 126-133. <https://doi.org/10.13057/biodiv/d200115>
- Dahloum L, Moula N, Halbouche M, Grasteau MS (2016). Phenotypic characterization of the indigenous chickens (*Gallus gallus*) in the Northwest of Algeria. *Arch. Anim. Breed.*, 59(1): 79-90. <https://doi.org/10.5194/aab-59-79-2016>
- Depison INP, Gushairiyanto (2020). Growth patterns, body weight, and morphometric of KUB chicken, Sentul chicken and Arab chicken. *Bull. Petern. J.*, 44(3). <https://doi.org/10.21059/buletinpeternak.v44i3.57016>
- Dorian S, Istina I (2009). Motivasi Petani terhadap Agribisnis Peternakan di Kabupaten Kampar (Studi Kasus Prima Tani Kabupaten Kampar). Pros. Seminar Nasional Membangun Sistem Inovasi di Pedesaan. pp. 15–16. Oktober 2009.
- BBP2TP, Bogor. Hlm. 698 – 704.
- FAO (2012). Phenotypic characterization of animal genetic resources. In FAO Animal Production and Health Guidelines No. 11, FAO, Rome, Italy.
- Faruque S, Siddiquee N, Afroz M, Islam M (2010). Phenotypic characterization of native chicken reared under intensive management system. *J. Bangladesh Agric. Univ* 8(1):79–82.
- Hutt FB (1949). Genetics of The Fowl. Mc Graw-Hill Book Company, London.
- Johari S, Sutopo S, Santi A (2009). Feno type frequency of the qualitative traits at adult Kedu chicken. Prosiding Seminar Nasional Kebangkitan Peternakan, Central Java, Indonesia. pp. 606–616. 20.
- Liyanage RP, Dematawewa CMB, Silva GLL (2015). Comparative study on morphological and morphometric features of village chicken in Sri Lanka. *Trop. Agric. Res.*, 26(2): 261–273. <https://doi.org/10.4038/tar.v26i2.8090>
- Kementerian Pertanian (Kementan) (2011). Keputusan Menteri Pertanian No. 2919/Kpts/OT.140/6/2011 tentang Penetapan Ayam Kokok Balenggek sebagai Rumpun Ternak Nasional. Menteri Pertanian Republik Indonesia. Jakarta.
- Khumnirdetch V (2002). State of Thai animal genetics resources. Paper presented at 7thWCGALP. August 19-23, 2002, Montpellier, France
- Kurnianto E (2009). Ilmu Pemuliaan Ternak. Graha Ilmu. Yogyakarta.
- Kuswardani W (2012). Studi ukuran dan bentuk tubuh ayam Ketawa, ayam Pelung, dan ayam Kampung melalui analisis komponen utama. Skripsi. Institut Pertanian Bogor. Bogor.
- Maharani D, Mustofa F, Sari APZNL, Fathoni A, Sasongko H, Hariyono DNH (2021). Phenotypic characterization and principal component analyses of indigenous chicken breeds in Indonesia. *Vet. World*, 14(6): 1665-1676. <https://doi.org/10.14202/vetworld.2021.1665-1676>
- Mastuti dan Hidayat (2008). Peran tenaga Kerja Perempuan Dalam Usaha Ternak Sapi Perah di Kabupaten Banyumas (Role of Women Workers at Dairy Farms in Banyumas District) Fakultas Peternakan Universitas Jendral Soedirman, Purwokerto.
- Negassa D, Melesse A, Banerjee S (2014). Phenotypic characterization of indigenous chicken populations in Southeastern Oromia Regional state of Ethiopia. *Anim. Genet. Resour.*, 55(2): 101-113. <https://doi.org/10.1017/S2078633614000319>
- Noor R (2000). Genetika Ternak. Penebar Swadaya, Jakarta
- Noor RR (2008). Genetika Ternak, Cetakan ke 2 Penerbit Swadaya, Jakarta
- Putri ABSRN, Gushairiyanto dan Depison (2020). Bobot badan dan karakteristik morfometrik beberapa galur ayam lokal. *Jurnal Ilmu dan Teknologi Peternakan Tropis*. 7(3):256–263
- Rusfidra (2004). Karakterisasi Sifat-sifat Fenotipik sebagai Strategi Awal Konservasi Kokok Balenggek Ayam di Sumatera Barat. Sekolah Pascasarjana IPB. Bogor
- Rusfidra, Arlina F (2014). A review of long crower chicken as poultry genetic resources in Indonesia. *Int. J. Poult. Sci.*, 13(11): 665-669. <https://doi.org/10.3923/ijps.2014.665.669>
- Rusfidra Y, Tumatra Y, Abbas MH, Arlina F (2014). Characterization of number of crow and qualitative marker of Kokok Balenggek Song Fowl Inside a captive breeding farm in Solok Regency, West Sumatera Province, Indonesia. *Int. J. Poult. Sci.*, 13(6): 343-446. <https://doi.org/10.3923/ijps.2014.343.346>
- Rusfidra (2004). Karakterisasi Sifat-sifat Fenotipik sebagai

- Strategi Awal Konservasi Kokok Balenggek Ayam di Sumatera Barat. Sekolah Pascasarjana IPB. Bogor.
- Rusfidra, Mendro Gusrizal, Yuda Gusrin, Muhammad H. Abbas, Husmaini, Firda Arlina, Kusnadidi Subekti and Tertia D. Nova (2015). Flock Composition, Effective Population Size and Inbreeding Rate of Kokok balenggek Chicken Breed under In-Situ Conservation. *Int. J. Poul. Sci.*, 14 (2): 117-119.
- Satiti E, Andarwati S, Kusumastuti TA (2022). Peran Perempuan dalam Peternakan Sapi Perah pada Kelompok Tani Ternak Desa Samiran, Boyolali, Jawa Tengah The Role of Woman in Livestock Farmers' Groups in Samiran, Boyolali, Central Java. *J. Kawistara* 12(1): 79-98. <https://doi.org/10.22146/kawistara.70721>
- Somes RG (1988). International registry of poultry genetic stock, bulletin document No. 476. Storrs Agricultural Experiment State on, The University of Connecticut.
- Subekti K, Arlina F (2011). Karakteristik genetik eksternal ayam kampung di Kecamatan Sungai Pagu Kabupaten Solok Selatan. *Jurnal Ilmiah Ilmu- Ilmu Peternakan* November 2011, Vol. XIV No. 2
- Warwick EJ, Astuti JM, Harjosubroto W (1995). *Pemuliaan Ternak*, Cet.5, Gadjah Mada University Press. Yogyakarta.
- Weigend SM and Romanov N (2001). Current strategies for assesment and evaluation of genetic diversity in chicken resources. *Journal World Poult* 57: 275-288.