

# ISTAP

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**Submission date:** 15-Apr-2023 01:14PM (UTC+0800)

**Submission ID:** 2065098791

**File name:** ISTAP\_SEMINAR.pdf (194.08K)

**Word count:** 2163

**Character count:** 11772

## Qualitative And Quantitative Traits of *Kokok Balenggek* Chicken, the Rare Indigeneous Chicken in West Sumatera

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**ABSTRACT:** *Kokok Balenggek* chicken is one of the rare indigenous chickens in West Sumatera are unique as they have a very nice song with multilevel sound. An experiment was conducted to identify the qualitative and quantitative traits of *Kokok Balenggek* chicken in West Sumatera. A total of 111 *Kokok Balenggek* chicken were characterized for qualitative and quantitative traits. The qualitative traits base on color of feather, plumage, flick feather, feather pattern, shank colour, and comb types. The quantitative traits studied were body weight and body size of *Kokok Balenggek* chicken. The result indicated that the predominant of qualitative traits of *Kokok Balenggek* chicken are coloured (ii), wild type pattern (e+), plain feather (ss), golden flick feather (ss), yellow shank coloured (ld) and single comb (pp). Based on the type of plumage color of *Kokok Balenggek* chicken have shown predominantly on Biriang (52,25%). Variations were found on quantitative traits such as body weight, number of crow, shank diameter and neck length.

**Keywords:** *Kokok Balenggek* chicken, nice song, qualitative, quantitative trait

### INTRODUCTION

The Indonesian native chicken apparently have species physical characteristic which differentiate them into at least 31 breeds or distinct groups of local chicken (Nataamijaya, 2000). Two breeds of chicken are known as ornamenta chickens because their voice are *Kokok Balenggek* and Pelung chicken. *Kokok Balenggek* chicken are unique because they produce a melodious song like crow, Have syllabic diversity, as each portion of the call can be composed with different pitches and vocalizations. They deserve to be conserved and developed as an indigenous germ plasm (Arlina *et al.*, 2014).

Local chickens are kept in many parts of the world irrespectively of the climate, traditions, life standard, or religious taboos relating to consumption of eggs and chicken meat (Tadelle, 2003). Unquestionably, the native breeds are valuable genetic resources for each country due to their adaptability to harsh conditions and their resistance against local diseases. There is little information about existing or potential productivity and production characteristics of indigenous chickens (Hoffman, 2005).

In the poultry field, identification and characterization efforts are prerequisites in utilization of genetic resources (Utoyo *et al.*, 1996; Weigend and Romanov, 2001). Characterization of indigenous livestock can be done in several ways, namely descriptions of phenotypic, genetic evaluation, DNA fingerprinting and karyotipe (Khumnirdpetch, 2002). The qualitative traits of the chickens also have important economic, cultural and religious function. Their specific characteristics must be carefully identified and considered in developing and breeding programs.

From the breeding point of view, the main qualitative traits in chicken are plumage color, comb type, shank feather, shank color, ear lobe present and color. On the other hand, the quantitative traits or polygenic traits such as body weight, body measurements (body weight, shank length, body depth and keel length) are the most important economic traits in poultry production. To study the existence and genetic improvement program in Indonesia, identification and characterization

of *Kokok Balenggek* are required. Therefore, the aim of this study was to characterize the *Kokok Balenggek* chicken based on some qualitative and quantitative trait.

## MATERIALS AND METHODS

A total number of 111 male of *Kokok Balenggek* were used in this research. These chickens were raised by small holders in the Tigo Lurah Regency, Solok District of West Sumatera Province, Indonesia. This research utilized the survey method and intensive direct examination. In sample selection, mature sex the purposive sampling method was utilized. The variety on base color of feather, color of the plumage, flick feather, feather pattern, shank color and comb types of the chickens were identified based on Hutt (1949) and Somes (1988). Data were analyzed using descriptive statistic analysis to compute means and their standard errors and coefficients of variation for quantitative traits.

## RESULTS AND DISCUSSION

### Qualitative Trait of *Kokok Balenggek* Chicken

Qualitative traits of *Kokok Balenggek* chicken including plumage color, shank color, comb type of *Kokok Balenggek* chicken are presented in Table 1.

**Table 1.** Percentage of qualitative traits of *Kokok Balenggek* chicken in West Sumatra

Qualitative Trait	Locus	Genotype	Phenotype	Total Sample (head)	Percentage of Phenotype
Feather color	I-i	I-	white	10	9.01
		ii	colored	91	81.99
Plumage color	E-e+-e	E-	black	12	10.81
		e+-	wild type	78	70.27
		ee	colombian	21	18.92
Feather pattern	B-b	B-	strip	41	36.94
		bb	plain	70	63.06
Feather flick	S-s	S-	silver	36	32.43
		ss	gold	75	67.57
Shank color	Id-id	Id-	Yellow/white	87	78.38
		idid	black/grey	24	21.62
Comb type	P-p	P-	pea	-	00.00
		pp	single	111	100

Base on the result of this research, the qualitative traits of *Kokok Balenggek* chicken were determined by color (ii) 81.99%, wild type pattern (e+) 70.27%, plain feather (ss) 63.06%, golden flick feather (ss) 67.57%, yellow shank coloured (Id-) 78.38% and single comb (pp) 100%. Similar observation by Sartika *et al.* (2008) also discovered that in the Kampung (village), the chickens were colourfull (ii), had wild type pattern (e+), plain feather (ss) and golden flick feather (ss), with yellow shank color (Id-) and single comb (pp). The presence of such large variations in plumage colours revealed that much genetic dilutions have occurred with native chickens which is about 60% (Bhuiyan *et al.*, 2005). No variations were observed in comb type. The comb type of *Kokok Balenggek* chicken was 100% single. The higher frequency of white/yellow shank color (78.38%)

to black/green color. this result is in line with the report of Sartika & Iskandar (2007) who found the white/yellow skin was dominant in the indiginous chickens in Indonesia. Large variation in plumage colour on the indiginous chicken population is indicative of unconscious selection effort (Arlina *et al.*, 2014).

#### Types of *Kokok Balenggek* (AKB) Based on the Plumage Color

The types of *Kokok Balenggek* (AKB) based on the plumage color that has been recognized by farmers in Tigo Lurah district can be seen in Table 2.

**Table 2.** Total and percentage of *Kokok Balenggek* chicken based on plumage color

Types of AKB	Dominant plumage color	Village			Total
		Batu Bajanjang	Tanjung Balik Sumiso	Rangkiang Luluih	
Biriang	Redish	23(65.72%)	13(50.00%)	22(44.00%)	58(52.25%)
Taduang	Black	2 (5.71)	8(30.77%)	2(4.00%)	12(10.81%)
Jalak	Greenish/black	2(5.71%)	4(15.38%)	14(28.00%)	20(18.02%)
Pileh/Bangkeh	Mix color	4 (11.43%)	1(3.85%)	6 (12.00%)	11(9.91%)
Kinantan	White	4(11.43%)	-	6(12.00%)	10(9.01%)
Total		35	26	50	111

These result indicated that the predominant the type of *Kokok Balenggek* chicken was Biriang (52.25%) followed by Jalak (18.02%), Taduang (10.81%), and Kinantan (9.01%). The plumage color of Biriang is dominant with red color while on the chest, wings and tail are black colored. *Balenggek* chicken is thought to be a derivative crosses the red jungle fowl (*Gallus gallus G*) with central areas of local chicken in the shifting cultivation area. Romanov and Weigend (2001) states that *Gallus gallus* is the ancestor of all domestic chickens that developed nations now. Hillel *et al.* (2003) states that the red jungle fowl is a single common ancestor (single ancestor) and a major contributor to the gene pool all domestic chicken nation in the world.

#### Quantitative Trait of *Kokok Balenggek* Chicken

Body weight and body measurements of *Kokok Balenggek* chicken are listed in Table 3.

**Table 3.** Mean, standard deviation (SD) and coefficient of variation (CV %) for quantitative trait of *Kokok Balenggek* chicken

Quantitative Trait	Mean	SD	CV
Body weight (kg)	1.59	0.33	20.85
Tibia lenght (cm)	13.80	1.19	8,61
Femur lenght (cm)	10.67	1.79	16.72
Comb height (cm)	4.58	1.10	23.93
Shank lenght (cm)	9.54	1.13	11.87
Wing lenght (cm)	22.10	2.62	11.78
Beak lenght (cm)	1.83	0.59	31.85
Shank circumference (cm)	1.60	0.34	21.47
Neck lenght (cm)	17.66	3.57	19.82
Total crow	4.99	1.42	28.39

The mean body weight of *Kokok Balenggek* chicken was 1.59 kg while the body measurements were tibia length 13.80 cm, femur length 10.67 cm, shank length 9.54 cm, wing length 22.10 cm and Shank circumference 1.60 mm, respectively. Beak length varied more (coefficient of variation = 1.85 %) while tibia length (coefficient of variation = 8.61 %) varied the least. The number of crow was ranging 3 to 9 crows with an average 4.99. These results were less as compared to the finding Abbas *et al.*, (1997) 11 crows and Rusfidra 6.7 crows (2004).

### CONCLUSIONS

The *Kokok Balenggek* chickens showed heterogeneity in the qualitative and quantitative traits considered. The result indicated that the predominant of qualitative traits of *Kokok Balenggek* chicken are coloured (ii), wild type pattern (e+ ), plain feather (ss), golden flick feather (ss), yellow shank coloured (ld ) and single comb (pp). Quantitative traits of *Kokok Balenggek* chicken was varied. The number of crow was ranging 3 to 9 crows with an average 4.99 crow. High diversity was founded in body weight, number of crow, shank circumference and neck length. Therefore, further investigation is required to search the diversity of *Kokok Balenggek* chicken through molecular research. In addition, it is important to take into account the uniformity of qualitative characters to make local strains are similar in their morphological and productive characteristics.

### ACKNOWLEDGMENT

We are very grateful to Directorate General of Higher Education, Ministry of National Education of the Republic of Indonesia which has provided the funding in conducting research in "Research Competitive Grant". Special thanks to the small farmer in Tigo Lurah Subdistrict who gave full efforts in supporting this research and for providing his chickens used in this study.

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