

ISSN 1682-8356
ansinet.org/ijps



INTERNATIONAL JOURNAL OF
POULTRY SCIENCE

ANSI*net*

308 Lasani Town, Sargodha Road, Faisalabad - Pakistan
Mob: +92 300 3008585, Fax: +92 41 8815544
E-mail: editorijps@gmail.com

A Review of “Long Crower Chickens” as Poultry Genetic Resources in Indonesia

Rusfidra and Firda Arlina

Faculty of Animal Science, Andalas University, Padang-25163, West Sumatera, Indonesia

Abstract: Indonesia has four breeds of long crower chicken, well-known as *Kokok Balenggek*, *Pelung*, *Bekisar* and *Gaga* chicken. The four breeds of those Indonesian local chicken have melodious crows and frequently send to chicken singing contest by fanciers. *Kokok Balenggek* chicken is a singing fowl from Solok Regency, West Sumatera Province and adopted as a symbol of Solok Regency. *Pelung* chicken is a local chicken from Cianjur Regency, West Java Province, which has unique, high pitch and long crower. *Bekisar* chicken is a local chicken from Madura Island, East Java Province. *Gaga* chicken is a local chicken from South Sulawesi Province. The four chicken breeds have been decided by Indonesian Ministry of Agriculture in 2011 as Indonesian poultry genetic resources. This article aims to compare the phenotypic traits of long crower between the four local chickens in Indonesia.

Key words: Long crower chicken, *Kokok Balenggek*, *Pelung*, *Bekisar*, *Gaga*

INTRODUCTION

Indonesia has been known well as a country which has numerous poultry genetic resources. Indonesia has so many breeds of local chicken such as *Ayunai*, *Kokok Balenggek*, *Burgo*, *Bekisar*, *Canghegar*, *Cemani*, *Ciparage*, *Gaok*, *Kampung*, *Kasintu*, *Kedu*, *Pelung*, *Lamba*, *Merawang*, *Nagrak*, *Nunukan*, *Walik*, *Sentul*, *Sumatera*, *Tolaki*, *Tukung*, *Wareng* (Nataamijaya, 2000; Muladno, 2008) and *Gaga* (Rusfidra, 2014).

At least there are four breeds of long crower chicken stated as poultry genetic resources in Indonesia, they are *Kokok Balenggek*, *Pelung*, *Bekisar* and *Gaga* chickens (Fig. 1-4). Those four breeds of Indonesian local chicken have beautiful melodious sound or what generally called as singing fowls. They are frequently sent to fowl singing contest by singing fowl fancier communities (Rusfidra, 2014). The *Kokok Balenggek*, *Pelung* and *Gaga* chickens breeds have been decided by Indonesian Ministry of Agriculture in 2011 as Indonesian poultry genetic resources (Indonesia Ministry of Agriculture, 2011a, 2011b, 2011c).

Long crower chicken phenomenon: Bioacoustics is the study of acoustic characteristics and biological significance of sounds emitted by living organisms. Birds are one of the few groups of animals known to exhibit vocal learning and use acoustic communication for territoriality, mate choice, offspring recognition, alarm signaling and individual recognition (Waldvogel, 2000). The syrinx is the sound producing organ in birds. The syrinx is classified as tracheobronchial, bronchial and tracheal. Two membranes in the syrinx, the membrane tympani formes lateralis and medialis produce sound (Goller and Sutter, 1996). The voice producing structure

of the syrinx is composed of two medial tympani form membranes and two lateral tympani form membranes (Khaksar *et al.*, 2012).

Bird song, like human speech, is a learned vocal behavior that requires auditory feedback when they learn to sing and as adults, songbirds use auditory feedback to compare their own vocalizations with an internal model of a target song (Solis *et al.*, 2000). Song learning in songbirds is a two-step process during which a young bird must first hear and memorize acceptable song models and then reproduce those songs through a gradual process during which it matches its own vocal output to memorize models (Slater, 1989).

Chicken are able to express about 30 sounds (words/syllables) of which 19 are distinctly identified as: warning, alarm, contact, territorial, laying, nesting, mating, threat, submissive, distress, fear, contentment, food, dust bathing, perching, battle cries, privacy, dominance and time calls. The sonogram indicates that chicken produces sound frequency ranging from 50 Hz to 10 kHz. The long crower chicken can be a model in teaching acoustic communication, animal behavior and the importance of imprinting in language learning (Tefera, 2012).

***Kokok Balenggek* Chicken (KBC):** KBC is a specific local chicken from West Sumatera Province which has been estimated for the only one breed type crow in the word (Rusfidra, 2004; Rusfidra, 2014; Rusfidra *et al.*, 2012; Rusfidra *et al.*, 2014a). KBC crows are produced only by males for two reasons: to proclaim to other males about his territory and to attract females to mate with them. The average crow consists of 4-17 syllables divided into three segments: first, middle and last



Fig. 1: Pelung chicken (Doc. Trubus)

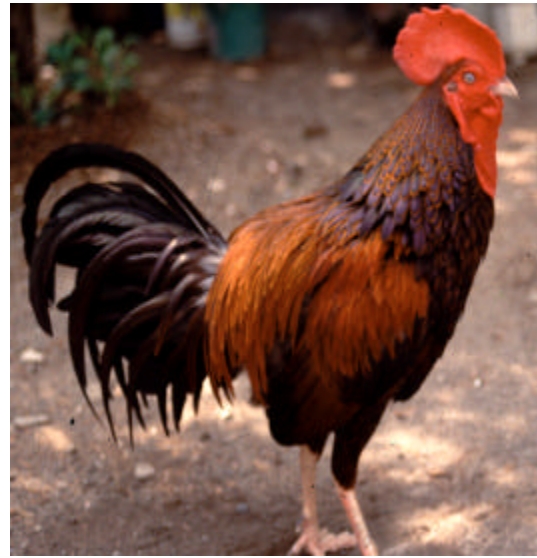


Fig. 3: Bekisar chicken (Doc. Trubus)



Fig. 2: Kokok Balenggek chicken



Fig. 4: Gaga chicken singing contest

segment. The average frequency of crowing is 8.08 times per 10 min. The peak of crowing activity happens in the morning with frequency of 9.59 times/10 min. The duration of a crow vary from 3.22 to 3.55 sec (Rusfidra, 2004; Rusfidra *et al.*, 2012). *Kokok Balenggek* has six crow type: *Ginyang*, *Rantak gumarang*, *Gayuang luluah*, *Sigegek angin*, *Riak ilia aia* and *Alang babega*. Waveform pattern of KBC crow is displayed in Fig. 5.

Pelung Chicken: *Pelung* chicken is a local chicken from Cianjur Regency, West Java Province. *Pelung* chicken has been playing an important role in the villagers in West Java Province as a source of local chicken meat

(Iskandar and Susanti, 2007). On a semi-intensive maintenance, *Pelung* can achieve body weight of 3.37 kg for cocks and 2.52 kg for hens, while the DOC body weight is 30.7 g for males and 31.6 g for females (Prayoga *et al.*, 2013). *Pelung* hens feather are black (61%), dark brown (20%) and brownish yellow (19%). The feathers color of all males *Pelung* are combination of black, red and yellowish red (Nataamijaya, 2005). *Pelung* chicken has been raised as a singing cockerel. Sound type of *Pelung* chicken has unique, high pitch and long crower. The crow duration of *Pelung* chicken varies from 11 sec (Nataamijaya, 2005) and 5.8-13.9 sec (Indonesia Ministry of Agriculture, 2011a). The song

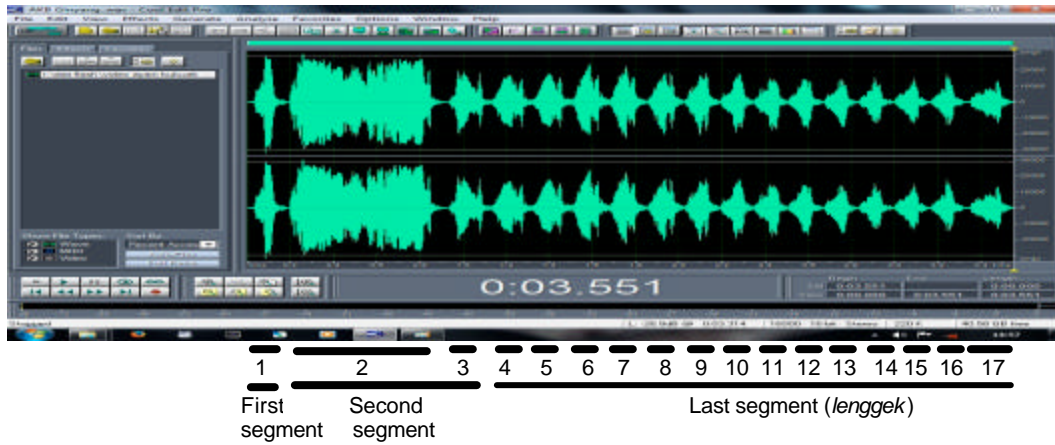


Fig. 5: Waveform pattern of KBC crow (Rusfidra *et al.*, 2014b)

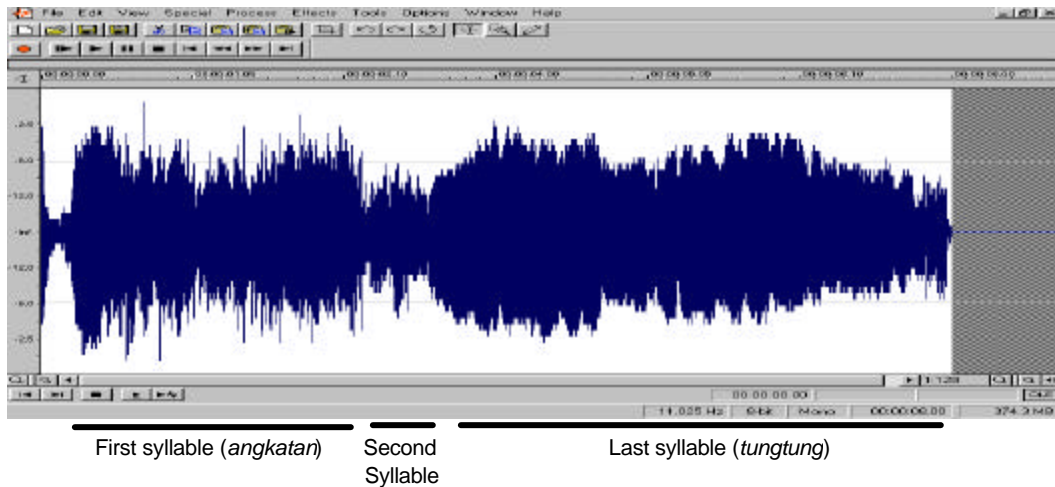


Fig. 6: Wave form pattern of *Pelung* chicken crow (Rusfidra, 2004)

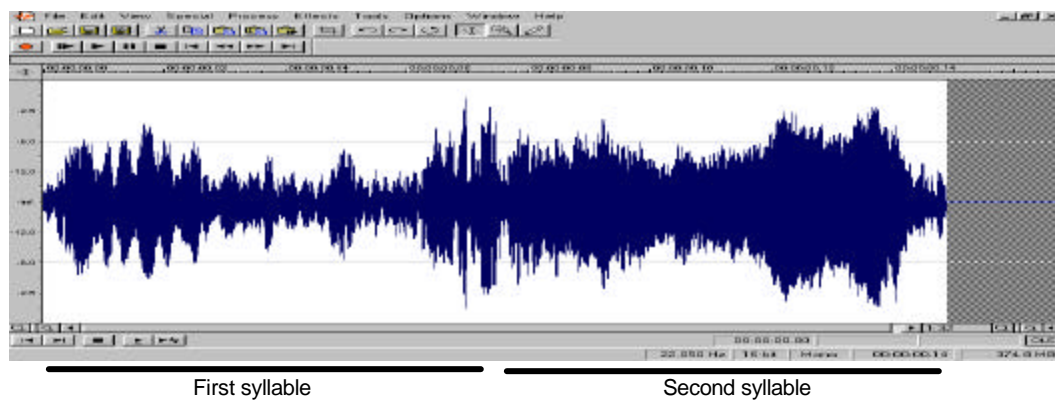


Fig. 7: Waveform pattern of *Bekisar* chicken crow (Rusfidra, 2004)

frequencies are in range of 399.85-1.352 Hz. Similar to KBC, sound of crows are produced only by males. The crows can be divided into three syllables: first syllable

(*angkatan*), second syllable and last syllable (*tungtung*) (Jatmiko, 2001; Rusfidra, 2009). The waveform pattern of *Pelung* chicken crow can be seen in Fig. 6.

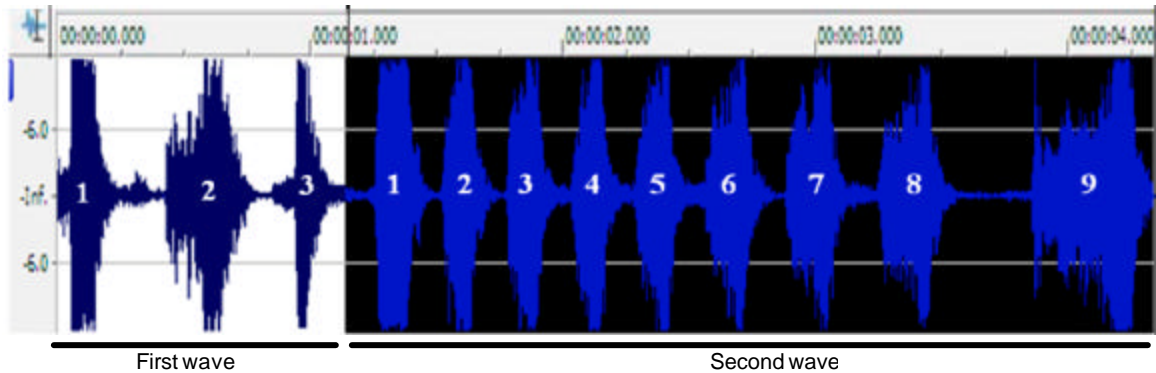


Fig. 8: Waveform pattern of *Gaga* chicken crow (Bugiwati and Ashari, 2013)

Bekisar chicken: *Bekisar* chicken is a poultry genetic resources from Madura Island, East Java Province. *Bekisar* chicken is a result of crossbreeding between Green Jungle Fowl (*Gallus varius*) with domestic chicken (*Gallus domesticus*). The roosters have a glossy blackish green plumage and are highly prized for their loud clear calls and striking coloration, while the hens are usually dull and infertile. The beautiful and melodious sound of *Bekisar* chicken has wave form pattern with two syllables as can be seen in Fig. 7.

Gaga chicken: *Gaga* chicken is a domestic chicken from Sidrap Regency, South Sulawesi Province. Based on type of crow, *Gaga* chicken can be classified into: (1) Slow Type, (2) *Dangdut* type and (3). *Garete* type (Livestock Services of South Sulawesi Province, 2011). Bugiwati and Ashari (2013) stated that *Gaga* chicken can be classified into: (1) Long group of *Dangdut* type (2) Short group of *Dangdut* type and (3) Slow type. The Long group of *Dangdut* type of *Gaga* chicken has crowing duration of 30.83 sec, the Short group of *Dangdut* type has crowing duration of 4.2 sec and the Slow type has 3.68 sec of crowing duration. The waveform pattern of *Gaga* chicken crow is shown in Fig. 8.

Conclusions: *KBC*, *Pelung*, *Bekisar* and *Gaga* chicken are long crower type and unique poultry genetic resources in Indonesia. The four local chickens have melodious and unique type crows and frequently send to chicken singing contest by fanciers in Indonesia. The sound analysis can be used to biosensor in animal welfare study on poultry genetics research. Waveform of crow analysis can be used to calculate of syllables, phrases and tool to referee singing contest.

REFERENCES

Bugiwati, S.R.A. and F. Ashari, 2013. Crowing sound analysis of *Gaga* chicken: Local chicken from South Sulawesi Indonesia. *Int. J. Plant. Anim. Environ. Sci.*, 3: 164-168.

Goller, F. and R.A. Suther, 1996. Role of syringeal muscles in gating airflow and sound production in singing brown thrashers. *J. Neurophysiol.*, 75: 867-876.

Indonesia Ministry of Agriculture, 2011a. SK. Menteri Pertanian No.: 2918/Kpts/OT.140/6/2011 about *Pelung* Chicken as The National Animal Genetic Resources.

Indonesia Ministry of Agriculture, 2011b. SK. Menteri Pertanian No.: 2919/Kpts/OT.140/6/2011 about *Kokok Balenggek* Chicken as The National Animal Genetic Resources.

Indonesia Ministry of Agriculture, 2011c. SK. Menteri Pertanian No.: 2920/Kpts/OT.140/6/2011 about *Gaga* Chicken as The National Animal Genetic Resources.

Iskandar, S. and T. Susanti, 2007. The characteristic and the use of *Pelung* chicken in Indonesia. *J. Wartazoa*, 17: 128-136.

Jatmiko, 2001. Studi fenotipe ayam *Pelung* untuk seleksi tipe ayam penyanyi. (Tesis). Bogor: Program Pascasarjana, Institut Pertanian Bogor.

Khaksar, Z., E.T. Kookhdan and P. Parto, 2012. A study on anatomy and histological structure of larynx in adult male and female turkeys. *World J. Zool.*, 7: 245-250.

Livestock Service Office of South Sulawesi, 2011. The *Gaga* chicken, poultry genetics resource from South Sulawesi.

Muladno, 2008. Local chicken genetic resources and production systems in Indonesia. FAO. GCP/RAS/228/GER Working Paper No. 6. Rome.

Nataamijaya, A.G., 2000. The native chicken of Indonesia. *Buletin Plasma Nutfah*. Vol. 6, No. 1.

Nataamijaya, A.G., 2005. Karakteristik penampilan pola warna bulu, kulit, sisik kaki, dan paruh ayam *Pelung* di Garut dan ayam Sentul di Ciamis. *Buletin Plasma Nutfah*, 11: 1-5.

- Prayoga, S.B.G., K. Hidayat and P. Iman, 2013. Identification of Pit-1 gen using PCR-RFLP and genetic evaluation of aching weight using paternal half sib on indigenous breed singing cockerel Pelung. Scientific Papers. Series D. Animal Science. Vol. LVI: 11-15.
- Rusfidra, Y.Y. Tumatra, M.H. Abbas, Y. Heryandi and F. Arlina, 2014a. 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: 343-346.
- Rusfidra, K. Prasetyo, S. Dt. Tan Marajo and Y. Heryandi, 2014b. Variasi pola wave form suara *Kokok* ayam *Kokok Balenggek* pada penangkaran ek-situ Kinantan bagombak farm. Paper pada Seminar Nasional Pengembangan Teknologi Hilirisasi dalam Upaya Meningkatkan Nilai Tambah Produk Pertanian. Politeknik Pertanian Negeri Payakumbuh, 3 Desember 2014.
- Rusfidra, Y.Y. Tumatra, M.H. Abbas, Y. Heryandi and F. Arlina, 2012. Identification of biacoustics marker of *Kokok Balenggek* song fowl inside a captive breeding farm in "Agutalok" Solok Regency, Indonesia. J. Peternakan Ind., 14: 303-307.
- Rusfidra, 2009. Comparison of characteristics of phenotype traits and song traits of *Kokok Balenggek*, Pelung and Bekisar chicken. Proceeding International Seminar of Biotechnology. Bukittinggi, June 28-29, 2009. Livestock of Services of West Sumatera Province.
- Rusfidra, 2014. Recent status riset bioakustik pada "ayam penyanyi" Indonesia; Studi pada ayam *Kokok Balenggek*, Pelung, Bekisar dan Gaga. Paper presented pada Seminar Nasional Perhimpunan Ilmu Pemuliaan Indonesia (PERIPI) Komda Riau. Pekanbaru, 10 Juni 2014.
- Rusfidra, 2004. Characterization of phenotypic traits as early strategy on farm conservation of *Kokok Balenggek* chicken in West Sumatera Province, Indonesia. Ph.D Disertation (unpublished). Bogor Agricultural University.
- Slater, P.J.B., 1989. Bird song learning: Causes and consequences. Ethol. Ecol. Evol., 1: 19-46.
- Solis, M.M., M.S. Brainard, N.A. Hessler and A.J. Doupe, 2000. Song selectivity and sensorimotor signals in vocal learning and production. PNAS, 97: 11836-11842.
- Tefera, M., 2012. Acoustic signals in domestic chicken (*Gallus gallus*): A tool for teaching veterinary ethology and implication for language learning. Ethiop. Vet. J., 16: 77-84.
- Waldvogel, J.A., 2000. Birdsong playback as a tool for teaching animal behavior. Proceedings of the 22nd Workshop/Conference of the Association for Biology Laboratory Education (ABLE), 489 <http://www.zoo.utoronto.ca/able/volumes/copyright.htm>.