

Native Chicken Production in Indonesia: A Review

Produksi Ayam Lokal di Indonesia : Sebuah Ulasan

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ABSTRACT

Indonesia is a country rich in native chicken genetic resources. There are 31 native chicken breed in Indonesia. Native chicken farming was developed for decades. In early period of 1907's, mostly farmers reared their native chicken by traditional system (about 80%). In 1980s until now, the number of native chicken farmers which rear native chicken by semi intensive and intensive system have been increasing. These rearing system changing have significantly increased the native chicken productivity. The major constraints for the development of native chicken i.e. low growth rate, risks of high mortality, low egg production. Many research results stated that improving in breeding, feeding and management aspect will increase native chicken production. The information and data contained in this paper is the result of study literature for scientific papers, either in the form of journals, books, or proceedings, and livestock statistics books. This paper is made to support the development of native chickens in Indonesia.

Keywords: native chicken, production, Indonesia

ABSTRAK

Indonesia merupakan Negara yang kaya dengan sumber daya genetik ayam lokal. Berdasarkan hasil penelitian, terdapat 31 jenis ayam lokal yang ada di Indonesia. Peternakan ayam lokal berkembang dari masa ke masa. Dari semula lebih banyak dipelihara secara tradisional, pemeliharaan ayam lokal secara semi intensive serta intensive semakin banyak dilakukan. Perubahan pola pemeliharaan tersebut berimbas terhadap kinerja produksi ayam lokal. Produk pangan yang berasal dari ayam lokal memiliki posisi yang baik di hadapan konsumen, sehubungan memiliki cita rasa yang khas di mata konsumen. Dalam mengusahakan peternakan ayam lokal terdapat beberapa kendala yang menghambat kinerja produksinya diantaranya; tingkat pertumbuhan yang lambat, tingkat kematian yang tinggi, serta produksi telur yang rendah. Untuk meningkatkan kinerja produksi ayam lokal maka perlu dilakukan perbaikan pada aspek breeding, pakan, serta manajemen. Informasi dan data yang terdapat dalam makalah ini merupakan hasil studi pustaka terhadap karya tulis ilmiah, baik dalam bentuk jurnal, buku, proseding, serta buku statistika peternakan. Untuk mendukung upaya pengembangan ayam lokal di Indonesia maka makalah ini dibuat.

Kata kunci; ayam lokal, produksi, Indonesia

INTRODUCTION

Indonesia is a country which have rich in genetic resources, especially in the native chicken genetic resources (Sulandari *et al.*, 2008). Iskandar (2011) stated that in the

1970s, most of the native chicken reared by traditional system (80%), in which each farmer had approximately 30 heads. Since 1980s, Native chicken farms has been increased tremendously, farmers not only rearing their native chicken with traditional rearing

system, but also implementing other rearing system (semi intensive and intensive).

Native chicken development in Indonesia is very important. As an animal protein source, native chicken has a significant role to providing more than 200 million Indonesian people requirement for animal protein. This condition gives the opportunity for native chicken stake holders to develop native chicken farms in Indonesia. Politically, the development of native chickens in line with Jokowi-Jusuf Kalla government agenda to achieve food self-sufficiency through controls on imports to food. Currently, the fulfillment of the national requirement to meat and egg chicken are largely sourced from broiler and layer chicken. Whereas seed of these chicken must be imported. According this condition, the development of native chickens as a source of animal protein national requirement is one way to achieve government's agenda in the field of food above. To support the development of local resources as a source of food, the authors try to presents the condition of native chicken productivity in Indonesia and how to develop native chicken production.

The information and data contained in this paper is the result of study literature for scientific papers, either in the form of journals, books, or proceedings, and livestock statistics book. Part to discussed in this paper are the history of native chicken in Indonesia, the types of native chicken in Indonesia, the role of native chicken in Indonesia, the existing condition of native chicken production in Indonesia, and ways to develop native chickens in Indonesia.

History of Indonesian Native Chicken

There are two theories that explain the origins of Indonesian native chicken. The first theory explains that native chicken originated from one ancestor (*monophyletic origin*). On the other hand, the second theory explains that native chicken come from several ancestors (*polyphyletic origin*) (Crawford, 1990).

Sulandari *et al.*, (2008) revealed that Indonesian native chicken comes from domesticated process of the red jungle fowl. Muladno, (2008) believed that native chicken

is historically the result of domestication of four wild chicken species: green wild chicken (*Gallus varius*), red wild chicken (*Gallus gallus*), Indian grey wild chicken (*Gallus Soneratti*) and Ceylon orange wild chicken (*Gallus lavayetti*). Sulandari *et al.* (2008) claimed that Indonesia is one of the main centre of chicken domestication in the world. Nataamijaya (2000) reported that there are 31 species (Table 1) native chicken in Indonesia.

The Role of Indonesian Native Chicken

Native chicken have a close relationship with Indonesian people life. In ancient times, native chicken were widely used as part of the Indonesian culture and customs (Sidadalog, 2007). Similarly with other developing countries, for Indonesian small holder farmers, native chicken represents one of the few opportunities for saving, investment and security against risk.

Based on their function, Nataamijaya, 2000 classified the Indonesian native chicken into several potential uses, such as; meat and egg producer, singing chicken, fancy chicken, used for traditional medicine and fighting cock (Table 1). Sartika and Iskandar, (2007) stated that Indonesian native chicken was classified into four functional groups i.e. singing chicken, used in traditional ceremonies, fancy and fighting Cock, meat and egg producer (Table 3).

Native Chicken Condition in Indonesian

Rearing system. Iskandar (2011) revealed that in the 1970s, the most of native chicken reared by traditional system (80%), with each farmer had approximately 30 heads. In the 1980s until now, there are three types of native chicken rearing systems in Indonesia, such as: traditional, semi-intensive and intensive system. Changing of rearing system from traditional to semi intensive or intensive made a better effect on native chicken production.

According to study results, application of intensif rearing system improved productivity of native chicken (Table 4). Muladno (2008) made description of traditional, semi-intensive, and intensive native chicken rearing system which showed on Table 2.

Table 1. Native chicken breed and it is originate

No	Breed Name	Breed Origin	Breed Characteristic	Breed role in the farmer
1	Sentul	Ciamis West Java	Sentul is main plumage color is grey which is it's typical general appearance	Meat and egg producer
2	Pelung	Cianjur West Java	Pelung is the largest and the tallest body compared to other breeds, it has also beautiful long crow which make it one of the most expensive birds in Indonesia	Meat produce, fighting cock and Singing bird
3	Kampung	Found in most villages of Indonesian archipelago	It is an ordinary chicken	Meat and egg producer
4	Lamba	Southern Garut West Java	Lamba has a slightly larger body size than Kampung chicken, with long neck, single comb and longer crow compared to Kampung chicken.	Meat and egg producer
5	Wareng	Indramayu West Java	This small size native chicken, It is very alert and difficult to catch, however it has better egg productivity than another Kampung chicken	egg producer
6	Banten	Banten	The Banten has firm and compact posture, with short, small pea comb. It has also a strong neck structure while its plumage is very similar to that of Kampung chicken	The Banten male chicken is a game type of bird
7	Ciparage	Karawang West Java	The male has a tall and solid body posture, is now practically extinct	Fighting cock
8	Siem	Found around Bogor and Jakarta areas	Siem chicken has a shiny blue black plumage, it's body size slightly bigger than Kampung chicken. It is well known to have an excellent mothering behavior	Egg producer
9	Rintit/Walik	The Rintit can be found everywhere in Indonesia although in very small numbers	This breed has a very distinctive appearance because it is plumage is frizzled.	Fancy bird
10	Nagrak	Nagrak Sukabumi West Java	If is a cross breed of male Pelung and female Kampung which has 87,5% Pelung's blood and 12,5% Kampung's blood. It has a much better growth rate than the Kampung and similar to Pelung. Nagrak chicken is raised to be sold as meat type bird.	Meat producer
11	White Kedu	Kedu Temanggung Central Java	It has white plumage with big single comb on male's head. The number of White Kedu is very small and it is impossible to gather a rather big number of White Kedu, within short time due to its rarity	It is needed to fulfill requirement for certain old traditional ceremonial activities
12	Black Kedu	Kedu Temanggung Central Java	It is flumage is almost thoroughly black with big single comb, the hen lays more eggs than Kampung chicken hen.	Egg and meat producer and fighting/game
13	Sedayu	Sedayu Magelang Central Java	It has a better size and body weight than Kampung chicken. It is also a good native layer, it is kept as egg producer at first year but after around 2 years production period will be sold as a good meat type native breed.	Egg and meat producer

Continued				
No	Breed Name	Breed Origin	Breed Characteristic	Breed role in the farmer
14	Cemani	Temanggung Central Java	Is Kampung or Kedu chicken which has a thoroughly black color of plumage, comb, wattles, tongue, skin, meat, leg scales and toes..	In Javanese society mainly, Cemani birds are needed to fulfill requirement for certain old traditional ceremonial activities, while some Chinese medicine use the Cemani as part of prescription
15	Nusa Penida	Bali Nusa Penida island Bali	It has a small body size and very alert. The male has thick neck plumage, wide wings and considerably long tail feather, while the female has a nice crest on top of the head.	Egg layer
16	Olagan	Bali	It has no feather on the neck while its body form tend to looked wider than the Kampung. The plumage is very similar to that of Kampung chicken.	Meat and egg producer
17	Sumatera	Central region of Sumatera	The male has a firm, compact and artistic body appearance with a long beautifully curved tail feather.	The female is also well known as a good native egg type
18	Merawang or Merawas	Bangka Island South Sumatera	It has reddish brown color plumage (Merawang) or golden brown (Merawas). The male has a big red single comb and wattles.	The female known as a productive layer. It is needed to fulfill requirement for certain old traditional ceremonial activities
19	Melayu	North Sumatera	The male posture is big and firm with small short red pea comb. The body plumage is not different from that of Kampung chicken	Fighting cock
20	Balenggek	Solok West Sumatera	It has three types i.e.,Gadang (big type), Batu (small type) and Ratiah (medium type). Their body plumage mostly combination of red, black and white.	Singing bird
21	Tolaki	South Sulawesi	It has an upright body posture small head, long neck and back, supporter by a pair of long but strong legs. Its body plumage color is not much different from the Kampung, yet it is very alert	Meat and egg producer and the game type native breed
22	Nunukan	Nunukan and Tarakan Island East Kalimantan	The male has a rather tall and big posture while it's female almost is similar size with the Kampung. Nunukan has a more uniform plumage color if compared with other breeds of native chicken. Male nunukan has an extremely short tail feather which is the typical characteristic of Nunukan breed	It is needed to fulfill requirement for certain old traditional ceremonial activities
23	Maleo	Central Sulawesi and Maluku Island	The cock is tall and slender, with a big beak, blue faced and black crest on its head make it looked very attractive. Its plumage basically black and shining reddish brown breast feather while it's tail feather is white	-

Continued				
No	Breed Name	Breed Origin	Breed Characteristic	Breed role in the farmer
24	Ayunai	Merauke Papua	It has no feather on the neck and crop while its wattles are red and big. Its body appearance tend to be round	Meat and egg producer
25	Jepun	-	The size of this breed is smaller than Kampung chicken, the cock has a red single comb while the plumage color is about the same as that of Kampung chicken. One typical characteristic is that it has a very soft fluffy feather structure, looks like that the feathers are not grown well	-
26	Bangkok	All area	Actually most of “Bangkok” chicken kept by the farmers is crossbred of pure male Bangkok with Kampung chicken. It has a tall, wide and firm body with wide and strong wings, short red pea comb. The most common plumage color is black with some red combination on the neck, back, breast and wings for the adult male	Game bird
27	Tukung	West Kalimantan	It is possibly one of the rarest type of native chicken found in Indonesia, male and female Tukung has no tail feather at all. The body size usually smaller than Kampung chicken.	Fancy bird
28	Bekisar	Kangean Island, Madura, East Java	The most highly appreciated native chicken in Indonesia; it has a very attractive shining body plumage. Its crow is very specific there fore it is known as singing bird. Bekisar is a crossbred of male Green Jungle Fowl with domestic fowl. The plumage color is very dependent on the parent’s plumage color	Singing bird
29	Burgo	South Sumatera	It is a crossbred of male Red Jungle Fowl with female Kampung chicken. Burgo is very similar to dwarf chicken yet it has a slightly bigger body size.	Fancy bird
30	Kasintu	Its scientific name is <i>Gallus-gallus bankiva</i> lives mostly in northern part of Java, South Sumatera, Bali and South Sulawesi	The main plumage color of the cock are black, ornamented with red color on its head, neck, back and waist. The hen usually has reddish brown plumage color with some blackish stripes.	-
31	Canghegar/Cukir/Alas	These wild birds live in southern part of Java, Madura and also in some other Indonesian Island	These are the native names for Green Jungle Fowl in Sundanese, Madura and Javanese Languages. It has much smaller body size than Kampung chicken. The body plumage of the cock basically black combined with shiny green scaly looked plumage. It has a big round rainbow colored single come with relatively long red wattles. The hen’s plumage color is pale brown with some small dark spots.	-

Source: Nataamijaya (2000; 2010) ; Sartika and Iskandar, (2007)

Table 2. Description of traditional, semi-intensive, and intensive rearing system

Rearing systems	Description
Traditional	<p>Chicken from first day until death are allowed to live freely without farmers' intervention. It doesnot have particular feed provided, cage constructed, health management applied and technology implemented. All chicken activities are so natural. Chicken can roam around the house or anywhere else to seek food, breed and engage in other activities such as playing with other poultry and taking care of young chicken, but return home to the farmer's house at sunset. At night, they sleep in the trees around the house or in the kitchen. Farmers usually have 2-20 heads. In traditional rearing system, zero cost is needed in rearing native chicken to produce eggs or meat. Farmers' profits when selling chicken will be the absolute chicken price minus the day-old chick (DOC) price. The extensive system is thus considered economically beneficial for the farmers since they do not need to spend much money and energy on rearing them. This is the most popular management system in the countryside because most farmers, who are usually uneducated, have no capital or access to financial institutions and no capital to buy feed, supplements, or medicine. This system is considered less suitable for increasing productivity of native chicken, because it is difficult to control their feed consumption.</p>
Semi-intensive	<p>DOC chicken are housed in an open-fenced area, which resembles a ranch and is usually built in the backyard of the farmer's house. Farmers provide feed and drink regularly, but it is not routine medical treatment. In some cases, colony cages are provided to allow chicken to sleep at night; in most cases, there are no cages available and the chicken sleep everywhere on the farm. Theownership of chicken, varies from 25 to several hundred, are usually kept for non-commercial purposes, for urgent and basic needs such as school fees. Almost no technology is applied in this system.</p>
Intensive	<p>The chicken population is classified on the basis of their life periods into 3 group: the <i>starter</i> (1 day–2 months); the <i>grower</i> (2 months–4.5 months); and the <i>finisher</i> (>4.5 months–sold/slaughter). The chicken are kept in cages in animal houseseither litter or portal system and provided with feed, water, feed supplements and regular medical applications. The production is usually for commercial purposes and is fully business-oriented. Farmers are very experienced and usually have a wide network. Efficiency and productivity in their chicken business is given top consideration. The number of chicken kept varies from hundreds to thousands, depending on financial sources.</p>

Source: Muladno (2008)

Table 3. The type kind of Indonesian native chicken usage

Type group	Chicken breed
Singing bird Used in traditional ceremonies	Pelung, Bekisar, Kokok Balenggek, Gaok, Ketawa Cemani, Black Kedu, White Kedu, Nunukan, Merawang
Fancy and fighting cock	Kate, Kapas, Mutiara, Poland/Kate Jambul, Serama, Bangkok, Sumatera/Melayu, Jalak Harupat, Bali/Olagan,
Producing meat and egg	Kampung, Kampung tolaki, Sentul, Arab, Kalosi, Wareng

Source: Sartika and Iskandar, (2007)

Table 4. Native chicken performance with three different rearing systems

Paramaters	Extensive	Semi Intensive	Intensive
• Mortality rate to sixth weeks of age (%) ¹⁾	50.30	42.60	27.20
• Weight of 5 months of age (gram) ¹⁾			
- Male	-	636.00	734.00
- Female	-	583.00	680.00
• Egg production (egg/head/year) ¹⁾	30.20	59.10	80.30
• Egg production (%) ²⁾	13.00	29.00	40.00
• Laid frequency (time/year) ¹⁾	2.50	6.00	7.50
• Egg hatchability (%) ¹⁾	78.20	79.10	83.70
• Feed conversion ²⁾	>10.00	8.00-10.00	4.90-6.40

Source: ¹⁾ Sinurat *et al*, 1992; ²⁾ Diwyanto *et al*, 1996

Table 5. Performance of several Indonesian native chicken breed reared in intensive production system

Parameters	Kampung	Black Kedu	white Kedu	Nunukan	Pelung
Body Weight (gr/head)					
• 4 week age	148.00	165.00	140.00	151.00	161.00
• 12 week age	708.00	575.00	739.00	665.00	669.00
• 20 week age	1408.00	1480.00	1320.00	1203.00	1663.00
Age at first laying (days)	151.00	138.00	170.00	153.00	165.00
Peak production (%)	55.00	75.00	72.00	62.00	44.00
Average egg production (%HDP)	41.30	38.80	54.00	50.00	32.50
Average egg weight (gr)	43.60	44.70	39.20	47.50	40.60
Average daily feed consumption (gr)	88.00	93.00	82.00	85.00	93.00
FCR (g feed/g eggs)	4.90	3.60	3.80	3.60	7.10

Source: Creswell and Gunawan (1982)

The number of households of native chicken farmer in Indonesia are 20.851.901 (Directorate General of Livestock Services, 2010). Percentage of native chicken farmer households by province from the largest to the lowest are mentioned respectively; in East

Java (21.75%), Central Java (20.84%), West Java (15.02%), Lampung (4.87%), Southern Sulawesi (4.39%), North Sumatera (4.18%), Banten (3.81%), Southern Sumatera (2.76%), East Nusa Tenggara (2.64%), Yogyakarta (2.23%), West Nusa Tenggara (2.15%),

Table 6. Population, meat and egg production of native chicken by province in Indonesia at year 2014

No	Provinsi	Population (head)	Native Chicken meat production (ton)	Native Chicken egg production (ton)
1	Aceh	6.222.882	13.047	2.646
2	North Sumatera	16.475.729	19.539	13.464
3	West Sumatera	5.066.861	6.208	3.236
4	Riau	3.343.227	3.490	1.627
5	Jambi	12.212.615	8.366	5.548
6	South Sumatera	5.803.254	7.775	3.599
7	Bengkulu	3.201.972	514	1.158
8	Lampung	11.945.715	14.916	9.810
9	Bangka Belitung Island	1.848.171	1.383	2.329
10	Riau Island	849.902	916	550
11	DKI Jakarta	-	36.713	-
12	West Java	26.740.836	26.081	17.901
13	Central Java	40.563.963	45.215	36.517
14	D.I. Yogyakarta	4.118.660	5.669	2.667
15	East Java	34.314.067	39.348	18.827
16	Banten	10.207.278	9.345	13.617
17	Bali	4.141.144	4.715	2.992
18	West Nusa Tenggara	5.082.973	5.479	3.247
19	East Nusa Tenggara	10.758.054	11.517	4.579
20	West Kalimantan	7.625.982	15.215	3.981
21	Central Kalimantan	3.420.614	2.295	2.908
22	South Kalimantan	8.779.413	3.054	7.183
23	East Kalimantan	7.272.201	8.039	4.658
24	North Sulawesi	2.322.510	2.504	1.925
25	Central Sulawesi	6.256.758	10.789	4.051
26	South Sulawesi	22.506.968	6.643	12.323
27	Southeast Sulawesi	10.508.239	11.328	6.819
28	Gorontalo	1.269.568	1.398	939
29	West Sulawesi	5.304.177	5.718	3.434
30	Maluku	3.874.780	418	2.509
31	Southeast Maluku	614.114	917	398
32	West Papua	1.867.756	1.366	643
33	Papua	2.017.653	2.175	1.306
	Total	286.538.036	332.096	197.387

Source : Directorate General of Livestock Services, 2014

West Kalimantan (1.88%), Bali (1.87%), West Sumatera (1.60%), Riau (1.58%), Southern Kalimantan (1.15%), Jambi (1.03%), Southeast Sulawesi (0.83%), Central Sulawesi (0.74%), Bengkulu (0.69%), Central Kalimantan (0.68%), Papua (0.61%), East

Kalimantan (0.57%), North Sulawesi (0.44%), Jakarta (0.40%), Bangka Belitung (0.38%), Gorontalo (0.36%), Maluku (0.27%), North Maluku (0.14%). Generally, the center of native chicken farmer household in the Java Island.

The number of population, meat and egg production of native chicken by province in Indonesia showed in Table 6. According to Table 6, the number of total Indonesian native chicken population is 286.538.036 heads (Directorate General of Livestock Services, 2014). The big ten province of native chicken population percentage are mentioned respectively; Central Java (14.15%), East Java (11.97%), West Java (9.33%), South Sulawesi (7.85%), North Sumatera (5.7%), Jambi (4.2%), Lampung (4.16%), East Nusa Tenggara (3.7%), Southeast Sulawesi (3.6%), Banten (3.5%).

According to The Directorate General of Livestock Services (2014), Indonesian native chicken contributes 11.13% of total national meat production of Indonesia. At present, the number of native chicken meat production in Indonesia is 332.100.000 kg (Directorate General of Livestock Services, 2014). Big five provinces which contributing to native chicken meat production percentage in Indonesia were Central Java (13.61%), East Java (11.84%), Jakarta (11.05%), West Java (7.8%), and North Sumatera (5.88%).

In 2014, native chicken egg production contributes 10.8% of total national egg production of Indonesia (Directorate General of Livestock Services, 2014). The latest number of total native chicken egg production in Indonesia was 197.387.000 kg. Similarly with native chicken meat production, native chicken egg production dominantly supplied by Central Java Province (18.50%), East Java (9.53%), and West Java (9.06%). Entirely, Indonesia native chicken egg production by all province showed in Table 6.

Improvement Efforts for Better Performance

Native chicken product has good brand in Indonesian market, so in Indonesia price of native chicken meat is more expensive than broiler meat. It is because the native chicken meat has specific texture, taste that preferred by most Indonesian people. Price of native chicken egg is also more expensive than layer egg. Beside to consumed, native chicken egg

also used as part of traditional herbal medicine called "Jamu" which is very popular in Indonesia.

Nataamijaya, (2000) stated that the major constraints for the development of native chicken is low production performance, such as; low growth rate, resulting in small carcass percentage, low body weight, risks of high mortality to Newcastle disease, low body size and egg size, low hen day (percent) and hen housed (number) egg production, low rate of laying, high in feed cost.

Many result of researches reported that improving in breeding, feeding and management will increase native chicken productivity (Nataamijaya, 2010; Iskandar, 2005; Ketaren, 2010). Many study result stated that improvement in genetic quality through cross breeding or selection process has successfully improved the native chicken production (meat and egg) (Iskandar *et al.*, 1998a, 1998, 1999; Sartika *et al.*, 2004; Jarmani *et al.*, 1998; Sidadalog *et al.*, 1996). Beside through genetic approach, feeding systems also improved native chicken production (meat and egg) (Widjastuti, 1999; Nataamijaya *et al.*, 2005; Nataamijaya, 2006). Several study result showed that using of management systems, namely; intensification rearing system with disease control improved native chicken production (Nataamijaya, 2000; Creswell and Gunawan, 1982; Sumanto *et al.*, 1990; Rasyid, 2000; Sinurat, 1992).

CONCLUSION

In line with the current government vision which want to realize self-sufficiency in food. Development of native chicken is one of answers to this governments dreams. Indonesia is rich in native chicken genetic resources, that why, Indonesia has the opportunity to fulfill the majority requirement for meat and egg chicken. To develop native chicken, there are several constraints; low growth rate, high mortality, and low egg production. Native chicken productivity increased by improving the breeding, feeding, and management practice.

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