

Native chickens and their production systems in Indonesia

Yusuf L. Henuk^{1*}, Jublin F. Bale-Therik¹, Gusti A. Kristina Dewi² and Chris A. Bailey³

ABSTRACT: Indonesian native chicken apparently have species physical characteristic are grouped into at least 34 breeds or distinct groups of local chicken namely: Ayunai, Balenggek, Banten, Bangkok, Burgo, Bekisar, Cangehgar, Cemani, Ciparage, Gaok, Jepun, Kampung, Kasintu, Kedu (Black and White Kedu), Pelung, Lamba, Maleo, Melayu, Merawang, Nagrak, Nunukan, Nusa Penida, Olgan, Rintit or Walik, Sedayu, Sentul, Siem, Sumatera, Tolaki, Tukung, Wareng, Sabu, and Semau. Some of them are used for non-food purposes such as offerings for religious rituals, beauty – voice and feathers, and cock – fighting. Among them, 18 breeds are most popular while 11 breeds are good meat and egg producers in Indonesia. Three types of production systems are used to raise native chickens in Indonesia, namely the extensive traditional system, semi-intensive system and the professionally managed intensive system. Under the extensive system, productivity appears to be extremely low with poor feed efficiency compared to the intensive system (37–47 eggs vs. 146–260 eggs; 8–10 vs. 4.9–6.4, respectively). The growth rate of the bird is also very low may takes 90 days to get to a kilogram of weight.

Keywords: Native chickens, Production systems, Indonesia

Introduction

Native chickens are commonly raised in many areas of Indonesia and play a major role in food production, often providing the main source of dietary protein in the diet of people. They are often called “non-breed chickens” – (“or “ayam kampung” or “ayam buras”) to differentiate local chickens from commercialized chicken breeds such as widely known strains of Cobb, Hubbard, Hybro, Isa, Hyline and Hisex (**Table 1**). Indonesian native chicken apparently have species physical characteristic are grouped into at least 34 breeds or distinct groups of local chicken namely: Ayunai, Balenggek, Banten, Bangkok, Burgo, Bekisar, Cangehgar, Cemani, Ciparage, Gaok, Jepun, Kam-

pung, Kasintu, Kedu (Black and White Kedu), Pelung, Lamba, Maleo, Melayu, Merawang, Nagrak, Nunukan, Nusa Penida, Olgan, Rintit or Walik, Sedayu, Sentul, Siem, Sumatera, Tolaki, Tukung, Wareng, Sabu, and Semau. Some of them are used for non-food purposes such as offerings for religious rituals, beauty – voice and feathers, and cock – fighting and indeed Kampung chickens are the most popular and kept almost throughout the entire country (Henuk and Bailey, 2014). Among them, 18 breeds are most popular in Indonesia while 11 breeds are good meat and eggs producers (**Figure 1**; Agriflo, 2013; Han, 2014). This paper reviews literature which identifies native chickens and their production systems in Indonesia.

¹ Faculty of Animal Science, University of Nusa Cendana, Kupang, ENT, INDONESIA.

² Faculty of Animal Science, University of Udayana, Denpasar, Bali, INDONESIA.

³ Department of Poultry Science, Texas A&M University, College Station, TX 77843-2472, USA

* Corresponding author: yusufhenuk62@live.com

Production systems of native chickens in Indonesia

The numbers of native chickens as well as the growth demand for poultry production is positively correlated with the human population in Indonesia, but native chickens are rarely found in the city areas because of space limitations. In rural areas of Indonesia they are important to the livelihoods of many farmers, where they are raised utilizing low input traditional management systems. It has been estimated that Indonesia with its population is over 247 million people in 2013 has an annual level of protein consumption from poultry meat of 7.4 kg/capita and poultry eggs of 87 eggs/capita. The total meat consumption from poultry in Indonesia is splitt between broilers (60%), layers (8%), native chickens (29%) and ducts (3%). Native chicken meat alone account for around 10% of Indonesia's total meat consumption compared to broiler (55%), beef (19%), pork

(8%), goat (7%) and others (1% -- Figure 2; Henuk and Bailey, 2014).

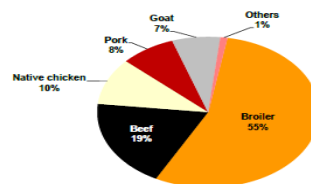
Native chickens are historically the result of years of domestication of four wild chicken species: Red Junglefowl (*Gallus gallus*); Grey Junglefowl (*Gallus soneratti*); Green Junglefowl (*Gallus varius*); and Ceylon Junglefowl (*Gallus lavayetti*) (Figure 3; Jianlin, 2014). The Red Junglefowl, which is believed to be the progenitor of the domesticated chicken, has its widest distribution in east Asia, from Pakistan through China, Eastern India, Burma, most of Indo-China, and on the islands of Sumatra, Java and Bali (Han, 2014). Existing poultry varieties comprise of a wide range of breeds and strains that have evolved in the process of domestication and breeding. Breeding of poultry for commercial purposes using highly efficient selection programmes has resulted in a few highly specialized lines dominating today's world market (e.g. see Table 1).



Figure 1 18 most popular breeds of native chickens in Indonesia.

Table 1 Grand parent stock of commercialized chickens breeds in Indonesia (after Kartasudjana and Supriyatna, 2010).

No.	Broiler	Layer	Origin
1.	-	Babcock B-300	France
2.	Arbor Acres	-	USA
3.	Bromo	Bromo	Indonesia
4.	-	Decalb Warren	USA
5.	Cobb	-	USA
6.	Hubbard	Harco	Hungaria/USA
7.	India River	Hyline	USA
8.	Hybro	Hisex Brown	The Netherlands
9.	Hypeco	Hypeco	The Netherlands
10.	-	Hubbard Golden Comet	USA
11.	Isa Vadette	Isa Brown	France
12.	Lohmann	Lohmann Brown	Germany
13.	-	H & N Brown Nick	USA
14.	Ross 208	-	England
15.	Shaver Starbo	-	Canada
16.	Tegel TM-70	-	Australia
17.	Avian	-	USA

**Figure 2** Native chicken meat accounts for around 10% of Indonesia's total meat consumption.**Figure 3** Distribution of the four wild chicken species (after Han, 2014).

There are many production systems employed in the poultry industry with each representing a particular economic method of poultry production under a given situation. The systems which are most suited to small scale poultry husbandry are: (1) free range, in which the birds can roam at will over an extensive area; (2) intensive, in which the birds are wholly confined, such as the deep-litter system; and (3) semi-intensive, in which the birds are partially confined, but have at least occasional access to an outside run or scratching shed or straw yard. Among them, the extensive systems or the traditional systems are not only favoured by a small minority of farmers, but already have a place in many developing countries (Bailey *et al.*, 2010). Three types of production systems are used to raise native chickens in Indonesia. First, in the extensive traditional system, chickens from day old until death are allowed to live freely with limited farmer' intervention. The birds are allowed to naturally roam around the house, seeking food, breeding, and engaging in other activities such interacting with other birds in the flock and rearing their young chicks. These birds return home to the farmer's house at sunset, where they sleep in the trees around the house. Farmers usually have between 2 and 20 birds. The second or semi-intensive system, is more efficient and often used by wealthier people as a source of extra cash to help supplement their primary source of income. In this system

the birds are usually housed in an open-fenced area, and the owner's provide feed and drinking water for them regularly, but not routine medical treatments. The bird numbers typically range from as few as 25 to several hundred. Finally, there is the professionally managed intensive system. In this system bird populations are separated on the basis of their life periods or phase of production. For example, the starter period (1 day–2 months); the grower period (2–4 months); and the finisher or laying period (> 4.5 months–culling). The number of chickens reared varies from several hundreds to several thousands, depending on the financial resources of the owner. Only a few farmers have large-scale farms. The annual eggs productivity from poultry reared using the intensive system is very high compared to the extensive system (146–260 eggs vs. 37–47 eggs) (Henuk and Bailey, 2014). Diwyanto *et al.* (1996) reported on the performance of native chickens in different production systems. Under the extensive system, productivity appears to be extremely low with poor feed efficiency compared to the intensive system (37–47 eggs vs. 146–260 eggs; 8–10 vs. 4.9–6.4, respectively). The growth rate of the bird is also very low may takes 90 days to get to a kilogram of weight. The average egg weight ranges from 39 g to 48 g while the hatchability ranges from 74% to 84 % in all production systems. The average mortality of them kept under the extensive systems is higher than the other two systems (Table 2).

Table 2 Performance of native chickens kept under different production systems.

Traits	Native Chickens Production Systems		
	Extensive	Semi intensive	Intensive
Egg laid/hen/year	47	59	146
Egg productions (%)	13	29	40
Laid frequency (time/year)	3	6	7
Hatchability of eggs (%)	74	79	84
Egg weight (g)	39–48	39–48	39–43
Daily feed consumption (g)	<60	60–68	80–100
Feed conversion	>10	8–10	4.9–6.4
Mortality < 6 weeks (%)	50–56	34–42	<27
Total mortality (start to end production)	<15	15	<6

Conclusions

Indonesia has at least 34 breeds of native chickens and 18 breeds are most popular while 11 breeds are good meat and egg producers. Three types of production systems are used to raise native chickens in Indonesia. They reared using the extensive production system are cheap and simple to keep, but losses and mortality are greater compared to either the semi-intensive or the intensive system, which require more inputs and greater capital requirements, which most village people cannot afford.

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