Public Erroneusly Perception on Nutritional Quality of Free Range Eggs and Production of Native Chickens in Indonesia and Thailand

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2015 ECHO ASIA [illegible] TURE WORKSHOP
Hosted jointly by ECHO Asia and Yayasan Abdi Satya
(March 3 - 5, 2015)
Pantai [illegible] INDONESIA

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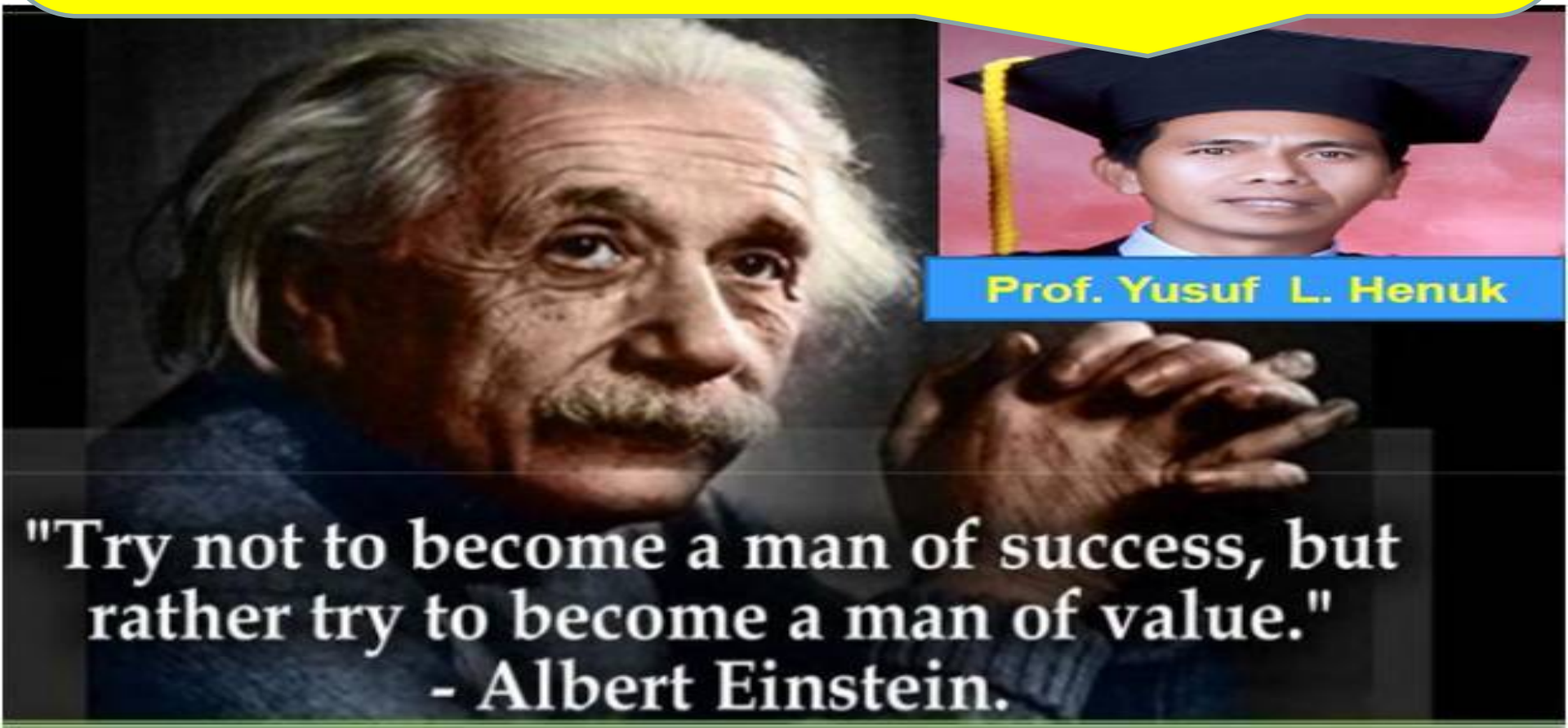
“Successful people are always looking for opportunities to help other. Unsuccessful people are always asking ‘what in it for me?’”



Public Erroneously Perception on Nutritional Quality of Free Range Eggs and Production of Native Chickens in Indonesia and Thailand

PUBLIC ERRONEOUSLY PERCEPTION ON NUTRITIONAL QUALITY OF FREE RANGE EGGS AND PRODUCTION SYSTEMS OF NATIVE CHICKENS IN INDONESIA AND THAILAND[+)]

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ABSTRACT

Today's consumers have an increased desire for eggs produced in more extensive poultry production systems, such as free range egg production, because of concerns about their health and the use of the cage environment. Currently, consumers have little knowledge and a lot of beliefs about eggs and egg quality. Their ideas on the ideal egg differ so much that it is not possible to define one or two ideal eggs. Each consumer seems to have his/her special preference for a certain combination of either external or internal quality characteristics of eggs such as freshness, type (free range or not), yolk colour, buying place, size or weight and shell colour. Consumers also erroneously believe that the following four common factors affect the nutritive value of eggs. They are: (1) fertile eggs are more nutritious than infertile eggs; (2) brown shell eggs are more nutritious than white shell eggs, or vice versa; (3) an egg with a deep yellow yolk colour is higher in nutritive value than those of a lighter shade and (4) free-range eggs are higher in nutritive value than eggs from cages. Although a tasting panel indicated a preference for free-range eggs when they were fresh and they could see what they were eating, blindfolded they could not tell the difference between those produced on range or in cages. No influence of housing environment (range or cage) on egg levels of Vitamin A or vitamin E. However, ß-carotene levels were higher in the range eggs which may have contributed to the darker colored yolks compared to the cage eggs. Eggs from a range production did have higher levels of total fat than eggs produced by caged hens, but they did not have higher levels of cholesterol. 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. Indonesian native chicken apparently have species physical characteristic are grouped into at least 34 breeds or distinct groups of local chicken. 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. Among them, 18 breeds are most popular in Indonesia. Good meat and eggs production capacity of 11 breeds of native chickens and their distribution in Indonesia: (1) Sumatera (West Sumatera), (2) Balenggek (Solok-West Sumatera), (3) Pitik Walik (Bogor – West Java), (4) Sentul (Ciamis-West Java), (5) Cemani (Kedu-Central Java), (6) Arab (Batu-East Java), (7) Bekisar (Madura-East Java), (8) Nunukan (Tarakan-East Kalimantan), (9) Ketawa (Sidrap-South Sulawesi), (10) Kalosi (South Sulawesi), and Ayunai (Merauke-Papua). Three types of production systems are used to raise native chickens in Indonesia: the extensive traditional system, the semi-intensive system, and the 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 average mortality of native chickens kept under the extensive systems is higher than the other two systems. Native chickens in Thailand increased each year with meat consumption is 4.5 kg/head/year and about 96% of population kept native chickens as food security either in small scale or commercial scale. Native chickens in Thailand were bred for various purposes such as fighting cocks, ornament and protein resource. There are three systems of keeping native chickens in Thailand. They are : (1) free-range of the extensive system, (2) semi-intensive, and (3) intensive system.

Key Words: Erroneously perception, Chicken eggs, Native chickens, Indonesia, Thailand

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Curriculum Vitae p. 22


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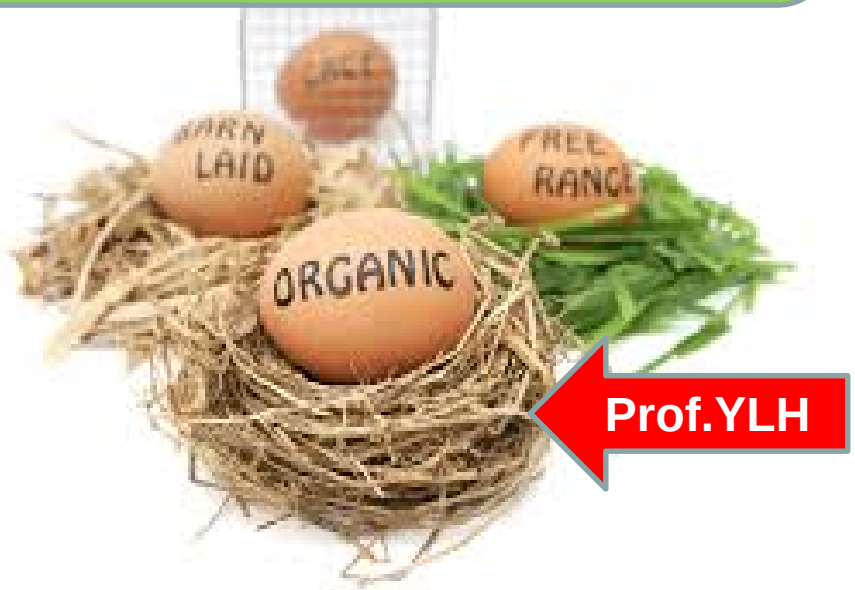
ProfYLH: "INVITED SPEAKER"

Why Free Range Eggs Are More Preferred By Consumers Than Other Eggs?



Prof.YLH

My Vote of Thanks!

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INTRODUCTION

- **Today's consumers have an increased desire for eggs produced in more extensive poultry production systems, such as free range egg production, because of concerns about their health and the use of the cage environment. The commercial egg industry is responding to these concerns by increasing the production of eggs in cage-free and range settings. However, one of the current issues is that our knowledge base as to how free range egg production methods influence egg performance, quality, and nutritional characteristics is limited to research studies that were conducted in the late 1940's and 1950's. This nutritional information on free eggs was collected with specific breeds, and not with modern lines of poultry that have been selected for very high rates of egg production (Anderson, 2011).**

INTRODUCTION

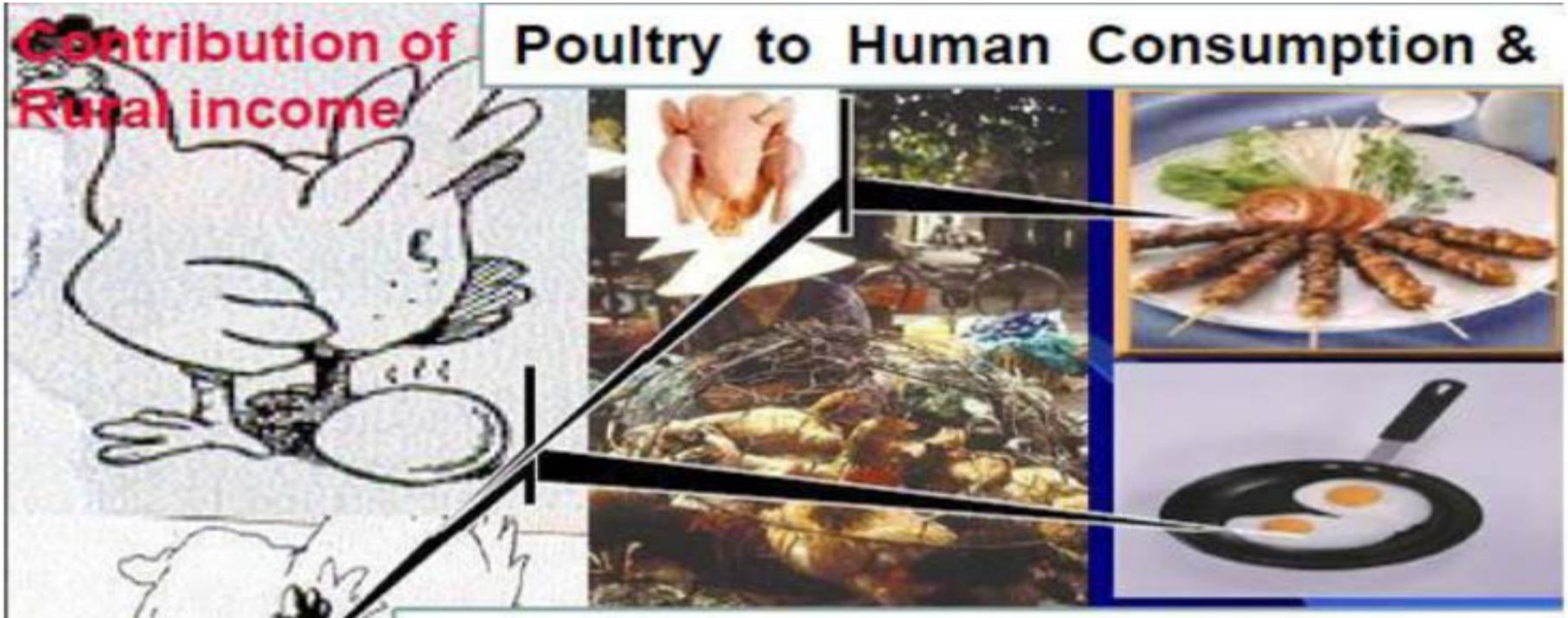
- The nutrient composition of eggs is important to consumers and to commercial egg producers. For consumers, particularly, the general public in many countries often thinks that eggs produced by free-range hens are nutritionally superior to eggs obtained from laying hens kept in traditional battery cages (Henuk *et al*., 2015).

- The special quality of the indigenous chicken meat such as smell, taste, and chewiness of the meat as generally accepted by consumers has caught the attention of some commercial producers. But most of the indigenous chicken populations remain on rural farm households (Chantalakhana, 2015).

INTRODUCTION

- Native chicken production in Asia and across the world has become important and strategic sector to provide high quality products, opening up job job opportunities, as well as improving farmer's income (Figures 1 –2; Duangjinda, 2015a). According to Hsia (2015), unless you use native chicken as food consumption as well as to enjoy with them, otherwise they are not easy to survive in the world.

Economic Benefits of Native Chickens (Henuk and Bailey, 2014)

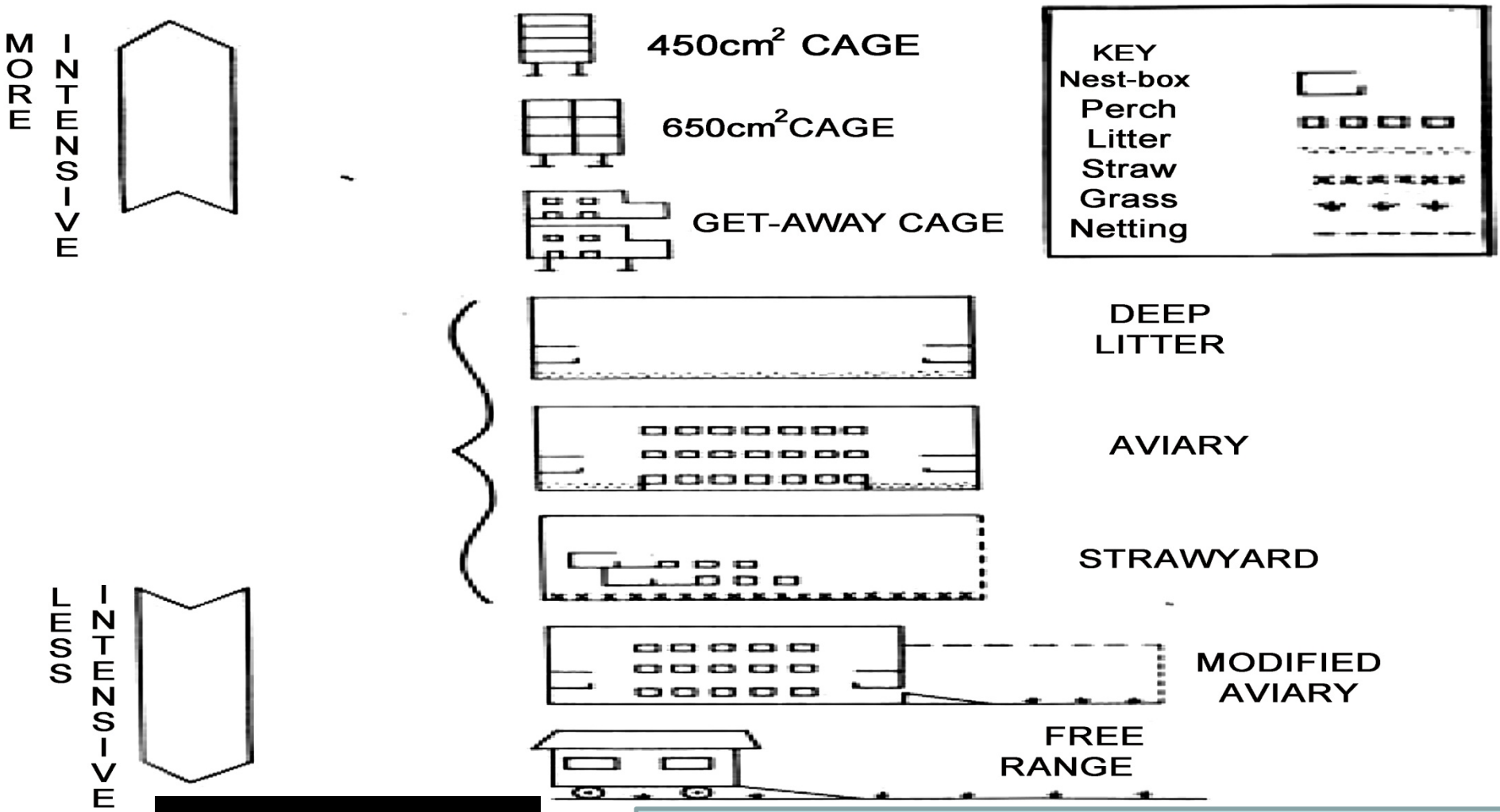


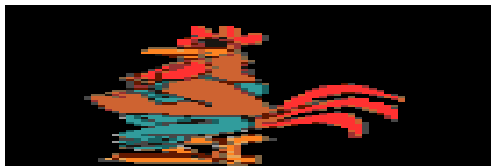
-A supplier of animal protein
- Potential to generate employment
- Increase rural income
- Result in the productivity use of land
- Produce raw material for industry

AIM OF THE PAPER

- **This paper will discuss public erroneously perception on nutritional quality of free eggs and native chickens production systems in Indonesia and Thailand.**

HOUSING SYSTEMS FOR POULTRY HUSBANDRY





(Henuk, 2015: 251)

Commercially, "free range" poultry farming is a system where birds are given free access to pasture and the accredited Code of Practice is that they must not be stocked above 1000 birds/hectare (Henuk et al., 2015)

When the birds are given free access to pasture?

Prof
Y
L
H

Free to range or not, have supermarkets egg on their faces?

The large farms are under laying pressure. **Melissa Fyfe** and **Royce Millar** go on site.

It's dusk in northern Victoria and 20,000 rust-red hens are scratching in [illegible] bed.

side density standard of 1500 hens per hectare – cannot supply the huge demand. The [illegible]

Good Promotion of Free Range Eggs

RSPCA

GUIDE TO CHOOSING

cage-free eggs

All egg boxes are labelled with how the hens were farmed. Make sure you check the box carefully, and don't buy eggs marked with 'Eggs from caged hens'.

Prof.YLH

ALWAYS CHOOSE EGGS LABELLED:

- Freedom Food
- Free-range
- Organic
- Barn

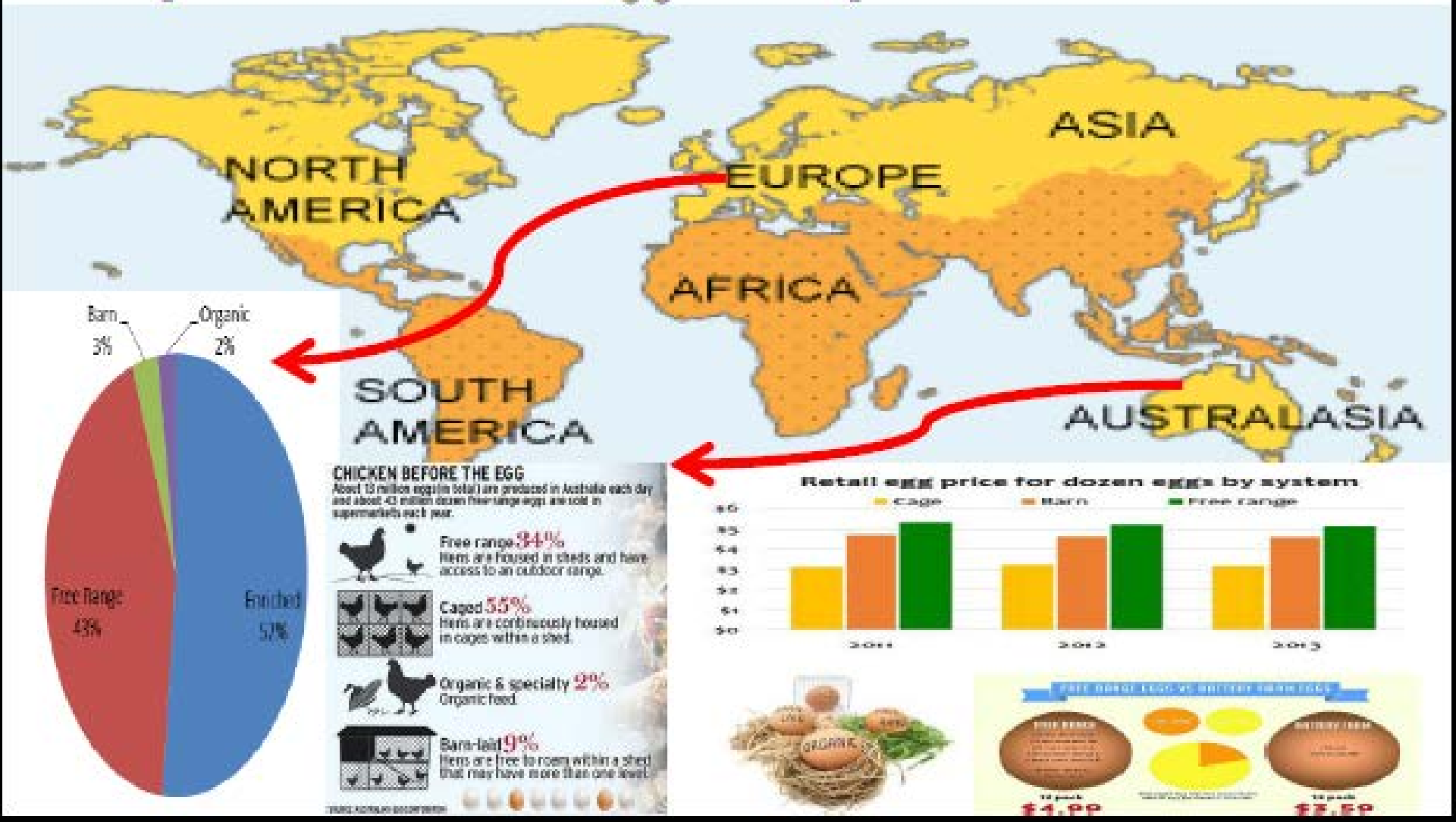
DON'T FORGET EGG INGREDIENTS, SUCH AS:

- sandwiches
- quiche
- mayonnaise
- cakes
- fresh pasta

ALWAYS check the packaging to be sure what you're buying contains cage-free eggs.

YOUR CHOICE MAKES A DIFFERENCE TO THE LIVES OF MILLIONS OF HENS

What's Production & Price of Free Range Eggs Compared To Other Eggs in Supermarket Outlets?



Why Free Range Eggs Are More Expensive?

"FREE-RANGE EGGS ARE MORE EXPENSIVE TO PRODUCE BECAUSE MORE EFFORT IS REQUIRED TO COLLECT THE EGGS, WHICH ARE MORE SUSCEPTIBLE TO SPOILAGE AND LESS LIKELY TO BE UNIFORM IN SIZE."

Yayasan Abdi Satya Poultry Farm in Indonesia

NATIVE CHICKENS IN INDONESIA

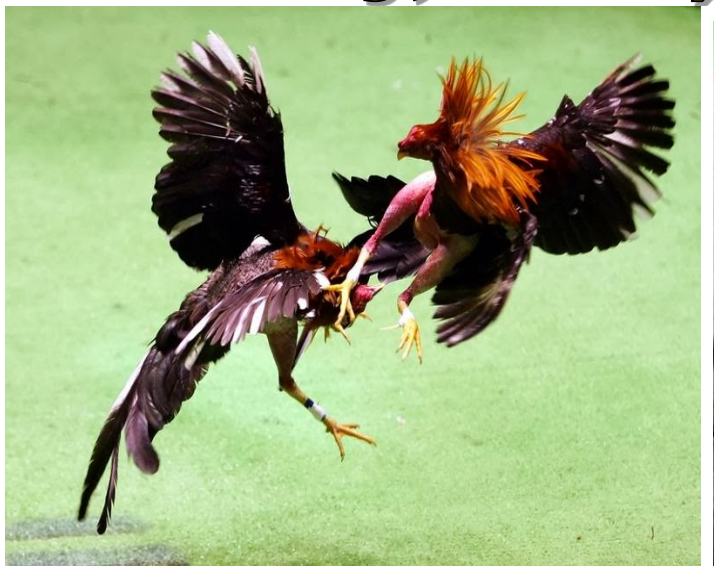
- **Native chickens are commonly raised in many areas of Indonesia and play a major role in food production, often providing the main source of dietary protein in the diet of people. They are often called "non-breed chickens"— ("or "ayam kampung" or "ayam buras") to differentiate local chickens from commercialized chicken breeds such as widely known strains of Cobb, Hubbard, Hybro, Isa, Hyline and Hisex (Table 1).**

- **Indonesia has at least 34 breeds or distinct groups of native chickens. Among them, 18 breeds are most popular.**

Use of Indonesian Native Chickens for Non-Food Purposes (Henuk and Bailey, 2014)

Type of native chicken	Use	Community using them
Nunukan	Offerings for religious rituals	Tarakan Island
Bekisar	Beauty – voice and feathers	Indonesia
Ciparage	Cock-fighting	Karawang, West Java
Gaok	Beauty – voice	Madura Island
Banten	Cock-fighting	Banten
Kampung	Offerings for religious rituals	Java and other regional/ethnic groups in Bali, East & West Nusa Tenggara.
Sabu and Semau	Cock – fighting	Savu Island and Semau Island, Province of East Nusa Tenggara

Use of Indonesian Native Chickens for Non-Food Purposes (Henuk and Bailey, 2014)



External & Internal Characteristics of Eggs Quality

Table 1a. Mean values for nutrient (per kg egg, edible weight of approximately 50 g) in eggs under three different systems of management (after Tolan *et al.*, 1974).

Nutrient	Cage system	Barn system	Free-range system
Moisture (g)	747	751	746
Fat (g)	109	107	111
N (g)	19.7	19.6	19.8
Protein (g)	123	122	124
Cholesterol (mg)	4350	4480	4890
Ash (g)	8.3	9.1	9.2
Na (mg)	1300	1300	1360
K (mg)	1350	1340	1380
Ca (mg)	550*	510	510
Fe (mg)	20.6	19.3*	20.8
Thiamin (mg)	0.91	0.66	0.90
Riboflavin (mg)	4.7	5.0	4.5
Nicotinic acid (mg)	0.68	0.65	0.70
Nicotinic acid equivalents (mg)	37.4	33.9	35.7
Pantothenic acid (mg)	17	18	18
Folic acid:			
- *Streptococcus faecalis* (µg)	60*	100	90
- *Lactobacillus casei* (µg)	250*	320	390
Vitamin B_{12} (µg)	17*	26*	20*
Tocopherol (mg)	15	18*	15
Retinol (µg)	1400	1360	1450

*P< 0.01.

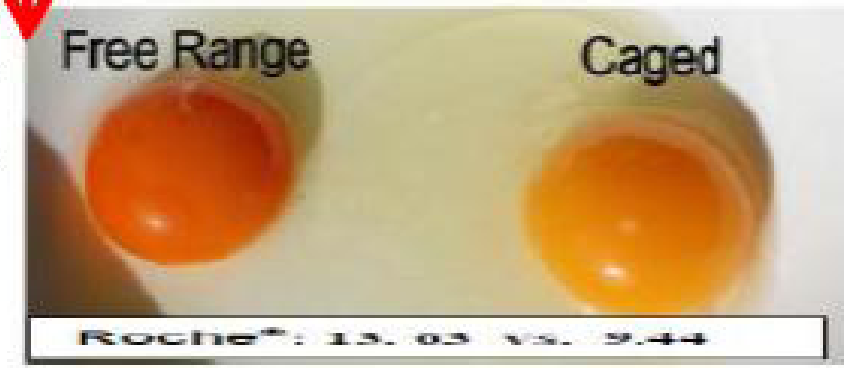
Table 1b. External and internal characteristics of egg quality (after Pavlovski *et al.*, 1981).

Characteristic of eggs	Cages	Free range	Significant effect
External			
- Egg weight (g)	57.66	59.45	NS
-Shape index	73.59	79.45	+
- Shell deformation (10^{-1} mm)	25.66	23.27	++
-Shell color (1–5 Light–Dark)	3.69	3.58	NS
Internal:			
- Albumen height (10^{-1} mm)	49.88	56.18	+++
- Haugh unit	68.74	71.59	++
- Yolk index	44.43	44.74	NS
- Yolk colour (Roche®)	9.44	13.63	+++
- Yolk as % of egg content	37.60	36.02	+++
- Shell Thickness (10^{-2} mm)	34.06	34.50	+++

NS, non significant; +, P< 0.05; ++, P< 0.01; +++, P< 0.001.

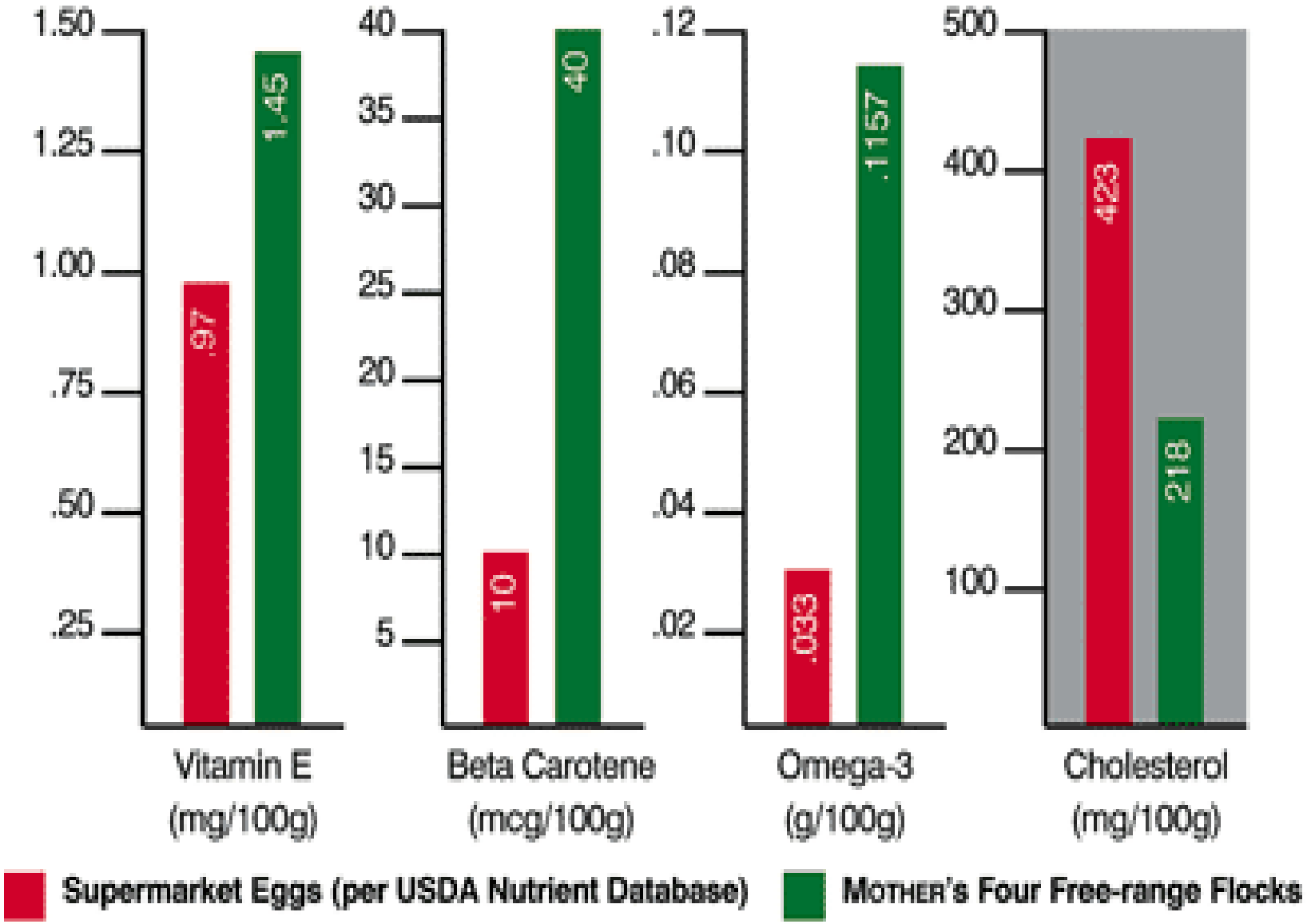
Table 1c. Folic acid and vitamin B_{12} contents of eggs (after Feltwell, 1992).

Types of eggs	Folic acid (µg/100 g)	Vitamin B_{12} (µg/100 g)
Cage eggs	25	1.7
Barn eggs	32	2.6
Free-range eggs	39	2.9



Henuk *et al.* (2015)

New Scientific Evidence on Internal Quality of Eggs



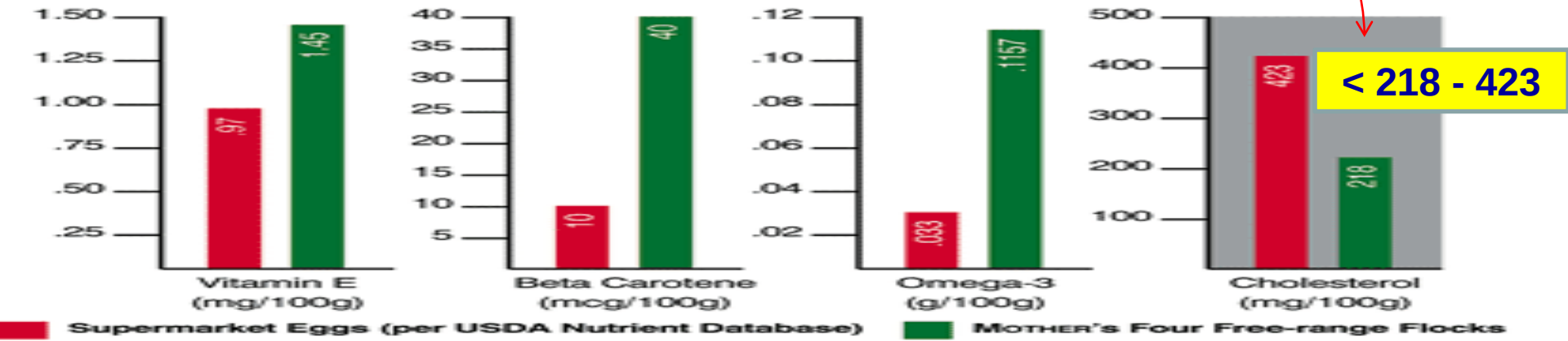
New Scientific Evidence on Internal Quality of Eggs

Tabel 1d. Effect of housing type on the nutrient composition of eggs (after Anderson, 2011).

Nutrient	Housing type		Pooled SEM
	Cage	Range	
Total fatty acids (%)	7.88b	8.11a	0.082
Saturated fatty acids (%)	2.55	2.55	0.033
Monounsaturated fatty acids (%)	3.67b	3.80a	0.041
Polyunsaturated fatty acids (%)	1.25B	1.36A	0.021
Fatty acids (mg/50 g)	70.56b	84.31a	3.85
Cholesterol (mg/50 g)	**163.42**	**165.38**	1.94
Vitamin A (IU/50 g)	160.42	156.15	4.57
B-Carotene (IU/50 g)	2.77B	10.54A	0.61
Vitamin E (IU/50 g)	1.30	1.31	0.02

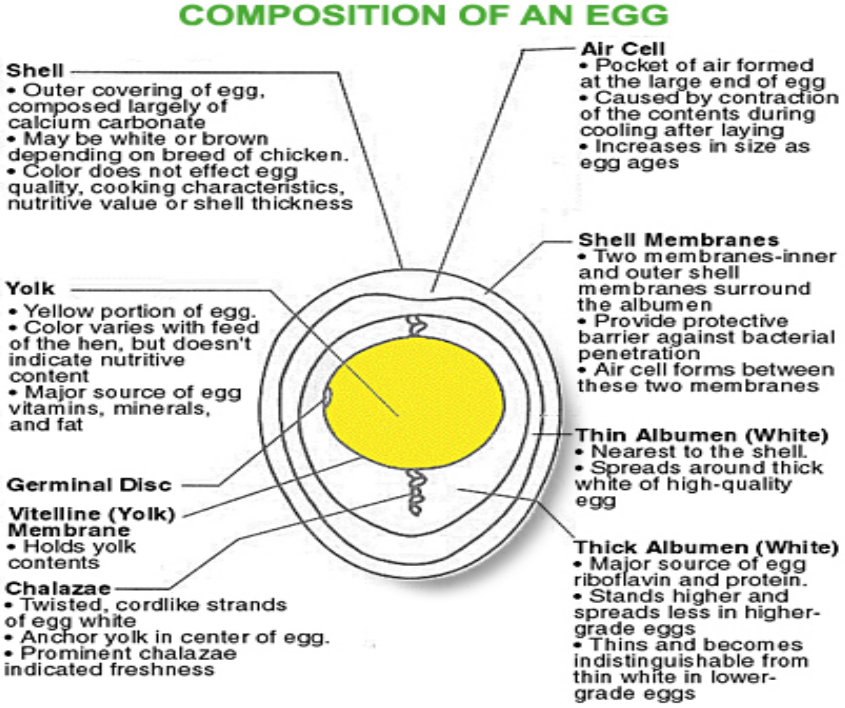
[a-b]Superscripts within coloum that are different represent a`significant different ($P < 0.05$)

[A-B]Superscripts within coloum that are different represent a significant different ($P < 0.001$).



New Scientific Evidence on Internal Quality of Eggs

No influence of housing environment (range or cage) on egg levels of Vitamin A or vitamin E. However, ß-carotene levels were higher in the range eggs which may have contributed to the darker colored yolks compared to the cage eggs. Eggs from a range production did have higher levels of total fat than eggs produced by caged hens, but they did not have higher levels of cholesterol recommended by supermarkets in the USA (163.42 mg – 165.38 mg vs 218 mg – 423 mg) – (Anderson, 2011).



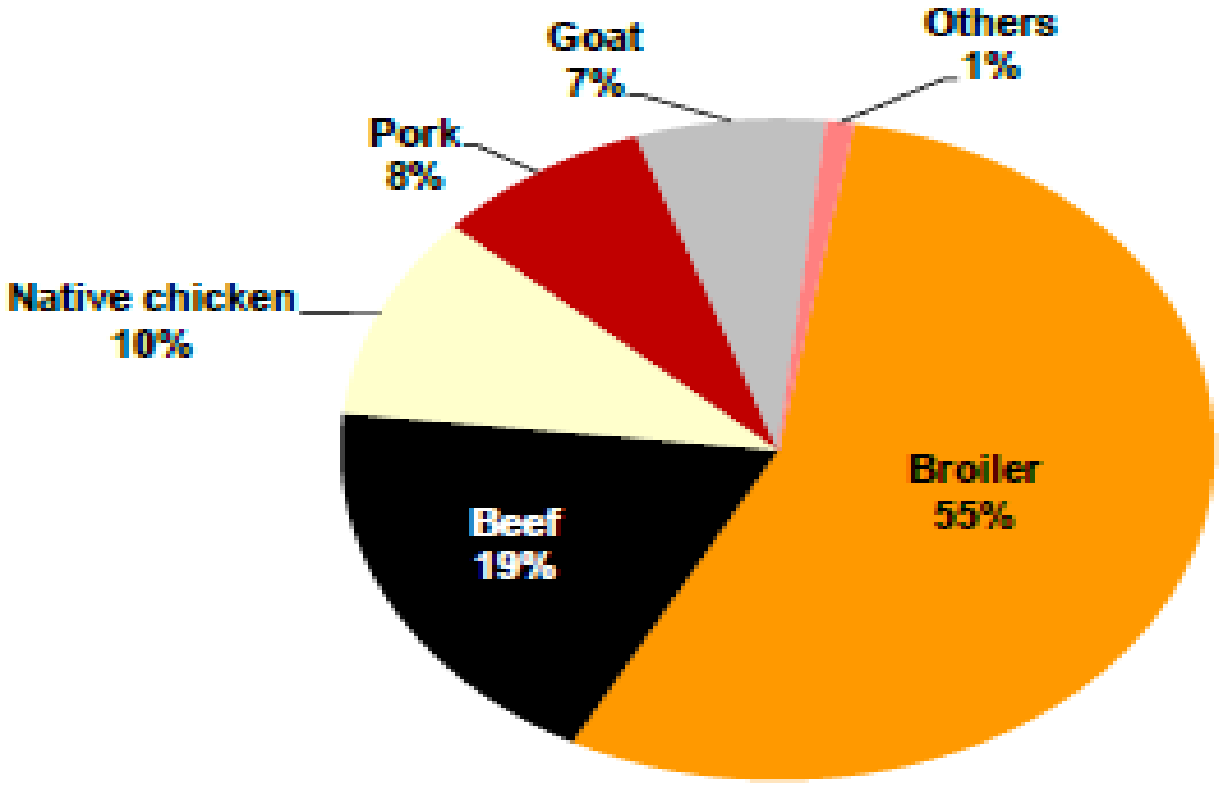
PRODUCTION SYSTEMS OF NATIVE CHICKENS IN INDONESIA

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'as total meat comsumption compared to broiler (55%), beef (19%), pork (8%), goat (7%) and others (1%).

Native Chickens Meat Account for Around 10% of Total Meat Consumption in Indonesia



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Grand Parent Stock of Commercialized Chickens Breeds 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 Acress	-	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

Meat & Eggs: modern chicken vs native chicken in Indonesia

KARKAS BROILER VS KARKAS BURAS

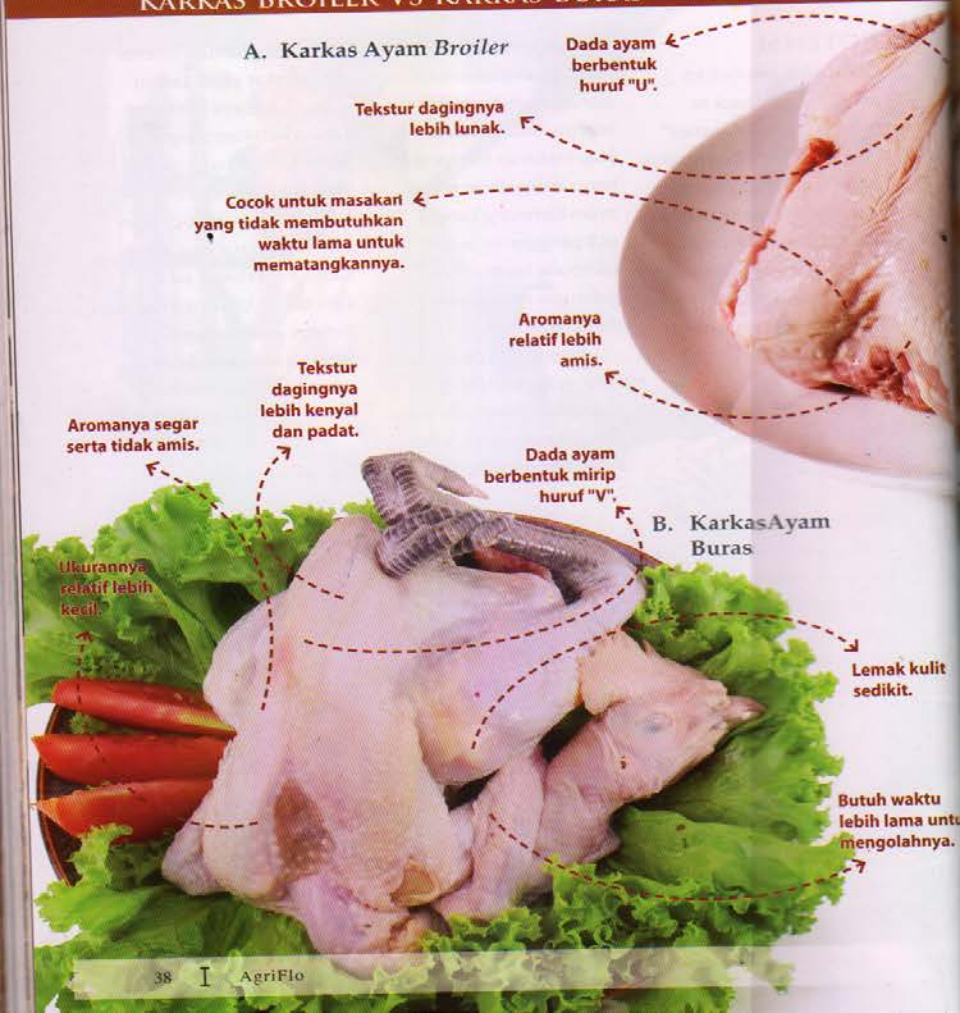
A. Karkas Ayam *Broiler*

Dada ayam berbentuk huruf "U".

Tekstur dagingnya lebih lunak.

Cocok untuk masakan yang tidak membutuhkan waktu lama untuk mematangkannya.

Aromanya relatif lebih amis.



TELUR NEGERI VS TELUR BURAS

A. Telur Ayam Ras

Kuning telur lebih pucat.

Diameter kuning telur lebih besar.

Diameter kuning telur lebih kecil.

Kuning telur lebih kemerahan.

B. Telur Ayam Buras

Tabel 4. Kandungan Gizi Karkas Ayam/100 g Bahan

Jenis Ayam	Energi (kkal)	Protein (g)	Lemak (g)
Ayam kampung	246	37,9	9
Ayam ras	295	37	14,7

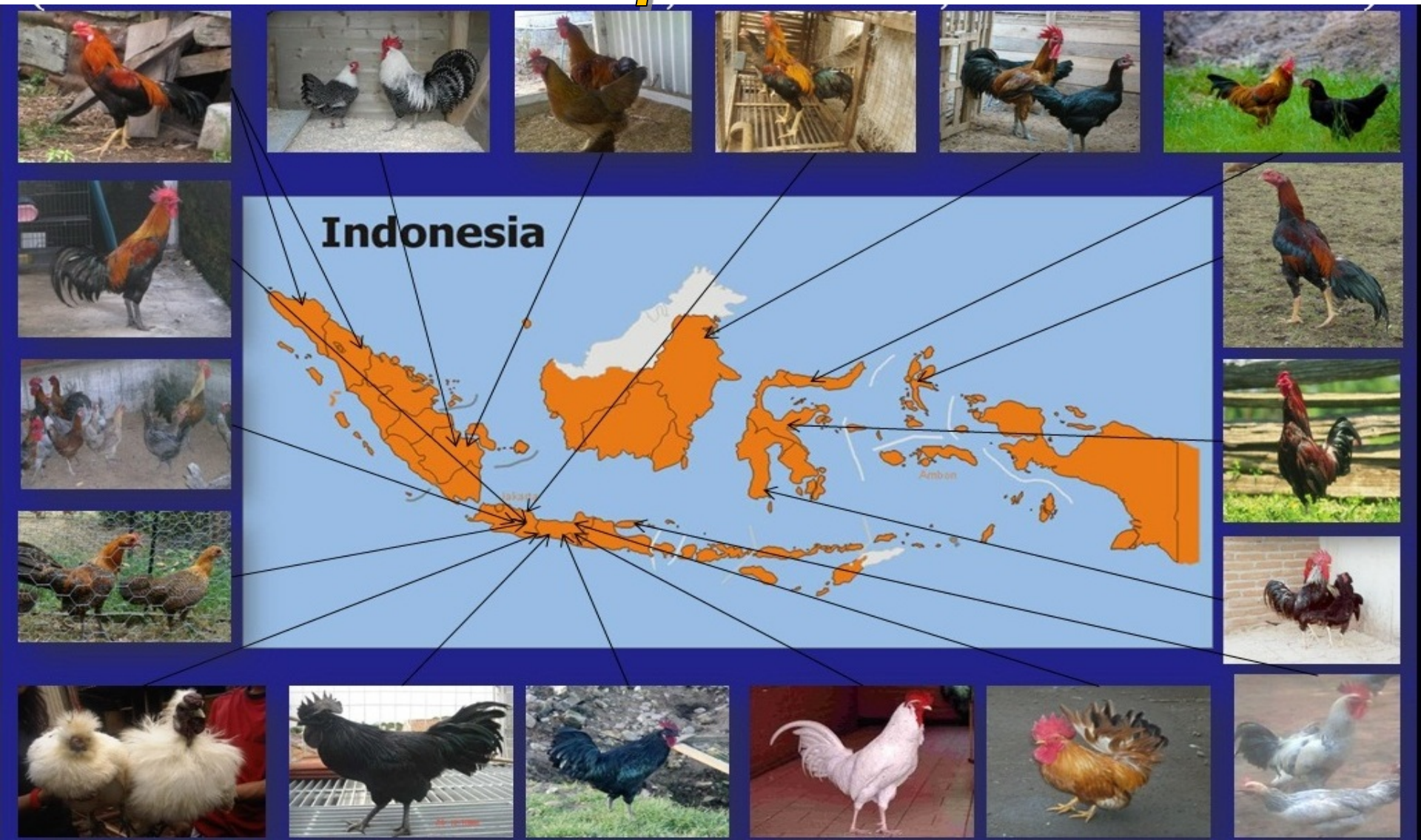
Sumber: Departemen Kesehatan, 1972

Tabel 5. Kandungan Gizi Telur Ayam Kampung/100 g Bahan

Zat gizi	Kuning Telur	Putih Telur	Telur Utuh
Energi (kal)	355	46	158
Air (g)	49,4	87,8	74,0
Protein (g)	16,3	10,8	12,8
Lemak (g)	31,9	0	11,5
Karbohidrat (g)	0,7	0,8	0,7
Kalsium (mg)	147	6	54
Fosfor (mg)	586	17	180
Besi (mg)	7,2	0,2	2,7
Vitamin A (µg)	600	0	270
Vitamin B1 (mg)	0,27	0,01	0,1

Sumber: Departemen Kesehatan, 1972

18 Out of 34 Breeds of Native Chickens Are Most Popular in Indonesia



11 top meat & eggs producers of native chickens in Indonesia

PENYEBARAN AYAM LOKAL DI INDONESIA

Ayam sumatera dari Sumatera Barat. Perawakannya gagah, tetapi ukurannya kecil. Ayam sumatera memiliki kulit wajah berwarna merah atau hitam, ditumbuhi bulu halus yang jarang. Bobot ayam sumatera jantan 2 kg, sedangkan yang betina 1,5 kg.

Ayam nunukan dari Pulau Tarakan dan Nunukan, Kalimantan Timur. Produksi telur 182 butir/ekor/tahun.

Ayam balenggek dari Solok. Produksi telur 12—18 butir/musim. Bobot badan jantan 1,6—2 kg/ekor, sedangkan betina 1—1,5 kg/ekor. Ayam kebanggaan Sumatera Barat ini hampir punah.

Ayam arab asal Batu, Jawa Timur. Potensi baik sebagai ayam petelur. Produksi telurnya 230 butir/ekor/tahun.

Pitik walik berasal dari Bogor dan Sukabumi, Jawa Barat. Ciri khasnya, yaitu bulunya yang tumbuh ke luar seperti rambut jabrik. Sosoknya mirip ayam kampung, dengan bobot jantan 1—3 kg/ekor.

Ayam sentul dari Ciamis, Jawa Barat, mendekati kepunahan. Berperan sebagai ayam petelur sekaligus pedaging. Terdapat lima varian ayam sentul, yaitu sentul kelabu, emas, geni, debu, dan batu.

Ayam ketawa berasal dari Sidrap, Sulawesi Selatan. Populer di kalangan hobiis karena kemampuan menghasilkan suara mirip tawa manusia.

Ayam kalosi berasal dari Sulawesi Selatan. Berperan sebagai ayam pedaging sekaligus petelur. Produksi telur 140 butir/ekor/tahun.

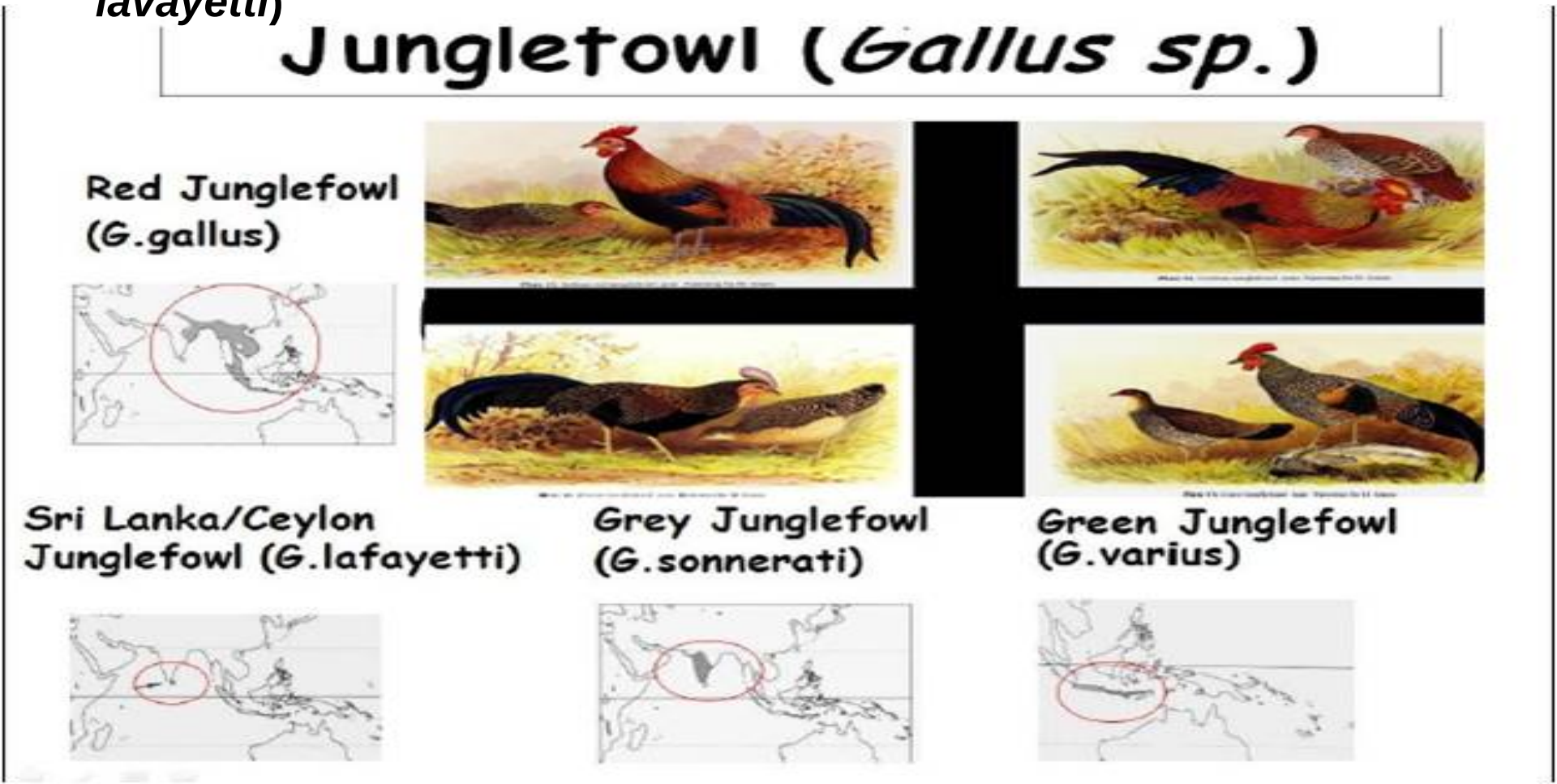
Ayam ayunai asli dari Merauke, Papua. Produksi telur 40—60 butir/ekor/tahun dengan bobot telur 45—55 g/butir.

Ayam bekisar. Ayam hias asal Pulau Kangean, Madura. Semakin merdu suaranya, harga jualnya semakin melambung.

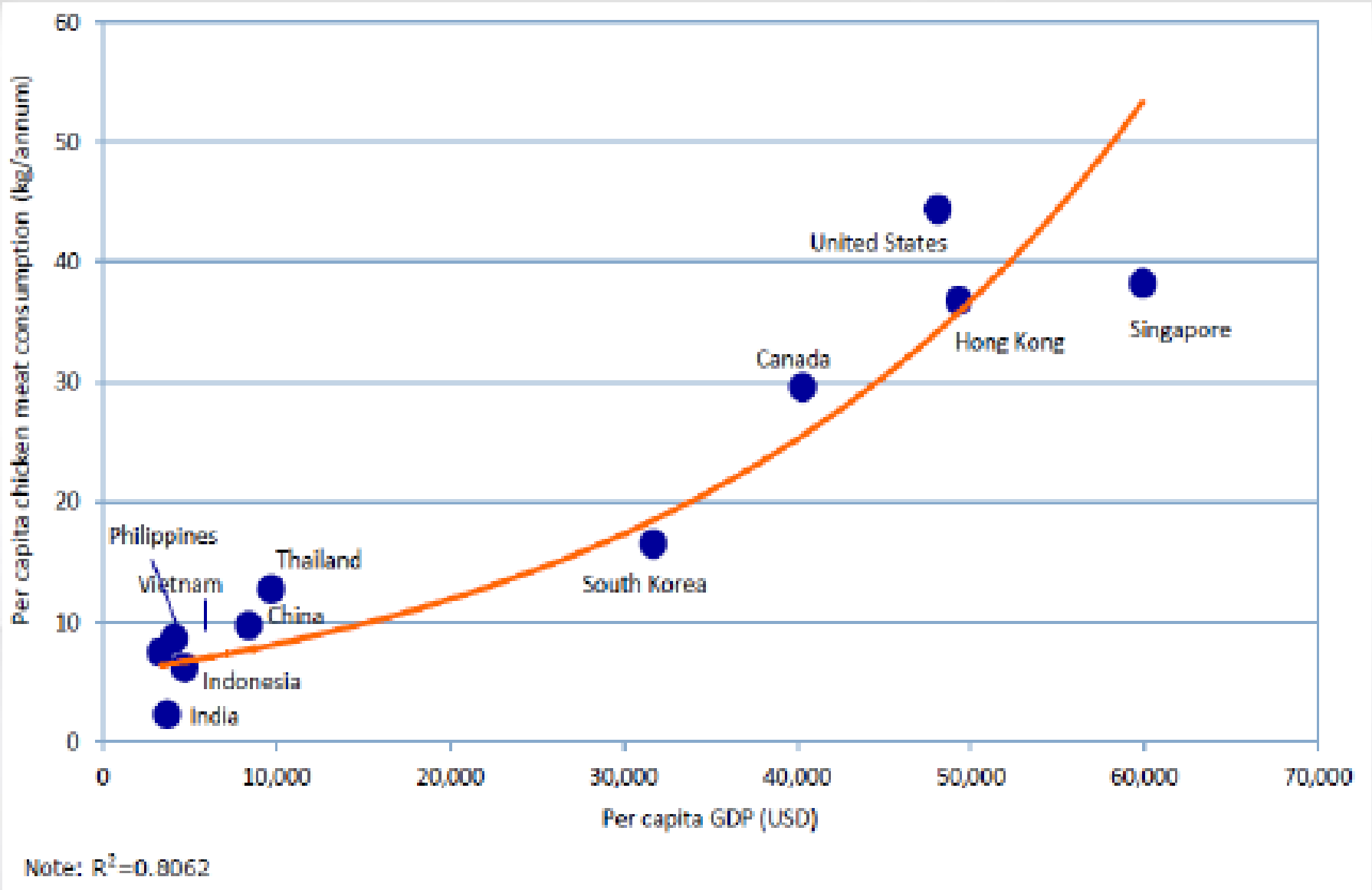
Ayam cemani berasal dari Kedu, Temanggung, Provinsi Jawa Tengah. Produk dagingnya sebagai "obat", produksi telur mencapai 215 butir/ekor/tahun.

Distribution of Four Wild Chicken Species

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*)



WORLD CHICKEN MEAT CONSUMPTION



Source: Rabobank, 2012

WORLD EGG PRODUCING COUNTRIES

Ranking	1990	2000	2010
1	China	China	China
2	USSR	USA	USA
3	USA	Japan	India
4	Japan	India	Japan
5	Brazil	Russia	Mexico
6	India	Mexico	Russia
7	Mexico	Brazil	Indonesia
8	Germany	France	France
9	France	Germany	Ukraine
10	Spain	Turkey	Turkey
11	Italy	Italy	Spain
12	Netherlands	Netherlands	Iran
13	UK	Spain	Italy
14	Thailand	Indonesia	Germany
15	Poland	Iran	Netherlands

Source: WATTAgNet, 2011

Figur 3. Peringkat Negara-negara Penghasil Telur Dunia (Hardiyanto, 2013).

Husbandry systems of Native Chickens in Indonesia

- **There are many husbandry systems employed in the poultry industry with each representing a particular economic method of poultry production under a given situation. The type or class of chicken and farm location plays a major role with respect to which rearing system is adopted.**

- **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.**

Husbandry systems of Native Chickens in Indonesia (extensive tradisional system)

- 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**.

Husbandry systems of Native Chickens in Indonesia (extensive tradisional system)

EKSTENSIF

Sistem pemeliharaan klasik ini minim campur tangan manusia. Ayam kampung dilepas begitu saja dan akan kembali ke kandang pada malam hari. Dengan sistem seperti ini diharapkan ayam kampung dapat mencari asupan pakan sendiri. Peternak kemudian akan mengambil produknya untuk konsumsi harian rumah tangga.

Ayam kampung yang diumbar bebas biasanya mempunyai tingkat kekebalan tubuh yang tinggi dan menghemat biaya pakan. Umumnya ayam cukup diberi pakan pada pagi hari saat akan dilepas. Pakan tersebut berupa sisa-sisa makanan dan bekatul secukupnya. Selebihnya, ayam dianggap dapat mencari makan sendiri di sekitar rumah.

Cara ini banyak ditemukan di negara yang industri peternakannya belum maju. Di Indonesia, cara inilah yang umum dilakukan oleh peternakan rakyat. Kelemahannya, ayam lambat untuk berkembang, waktu beternak terlalu lama yang berarti mengurangi produktivitas, serta kontrol pemeliharaan sulit dilakukan. Kontrol dan pengendalian penyakit sulit dilakukan karena ayam berkeliaran bebas sehingga sangat rawan terhadap serangan penyakit endemik seperi ND, kolera, bahkan flu burung. Cara pemeliharaan ini sebaiknya dilakukan jika ternak ayam kampung berjumlah sedikit.

Pemeliharaan secara tradisional. Telah melekat erat dalam budaya masyarakat kita

Husbandry systems of Native Chickens in Indonesia (semi-intensive system)

- The 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**.

Husbandry systems of Native Chickens in Indonesia (semi-intensive system)

SEMIINTENSIF

Pada sistem pemeliharaan ini sudah mulai ada campur tangan peternak. Pemelihara sudah mulai menerapkan ilmu pengetahuan dan teknologi untuk meningkatkan produksi ternaknya. Ayam kampung masih dilepas, hanya saja tidak sebebas pada sistem pemeliharaan ekstensif.

Sudah ada usaha menyediakan tempat khusus untuk ayam bermalam, meskipun masih berwujud kandang sederhana. Selain itu, diberikan makanan tambahan walaupun hanya menir atau dedak. Peternak juga membawa ayamnya ke mantri hewan untuk divaksin tetelo.

Cara pemeliharaan ini banyak dilakukan oleh peternak yang tingkat ekonomi dan pengetahuannya relatif tinggi, terutama di daerah Pantai Utara Pulau Jawa dan Tapanuli, Sumatera Utara. Cara ini juga banyak diterapkan oleh penduduk kota. Ayam kampung yang dipelihara di kota memang tidak diberi pakan secara khusus, seperti halnya ayam yang dipelihara di desa. Ayam kampung tersebut dapat memakan sisa-sisa dapur yang cukup banyak atau sisa-sisa restoran yang cukup potensial bagi makanan ayam kampung.

Pemeliharaan ayam lokal secara semiintensif masih perlu didukung dengan penerapan program vaksinasi yang ketat untuk menjaga kesehatan ayam dari serangan penyakit musiman.

Budi daya sistem semiintensif. Kini mulai dilirik masyarakat umum

Husbandry systems of Native Chickens in Indonesia (intensive system)

- 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) and mortality is typically lower than the other two rearing systems as well.

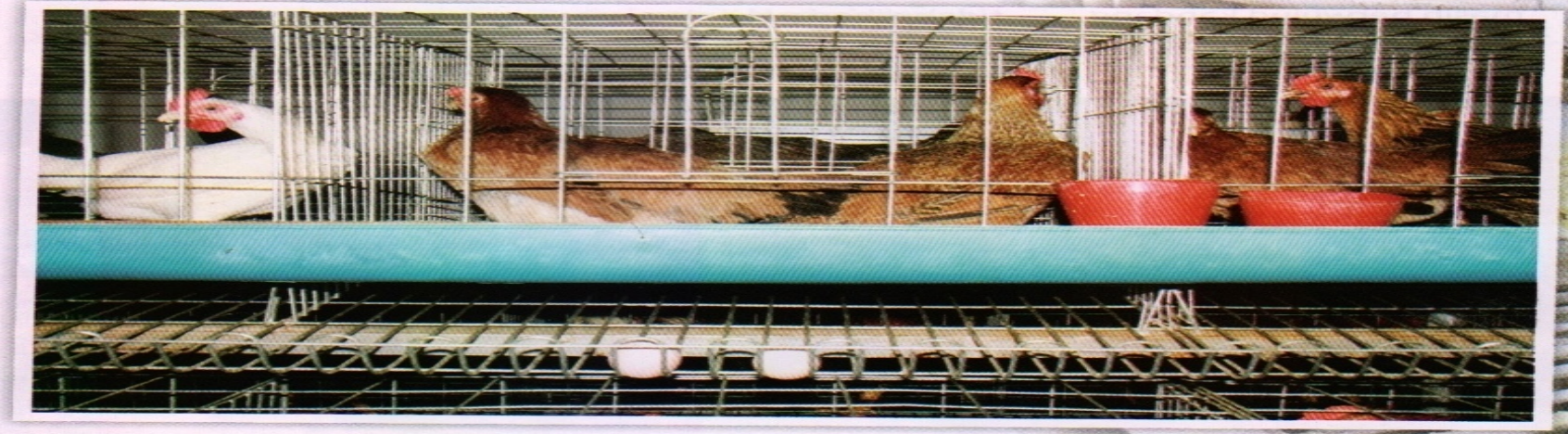
Husbandry systems of Native Chickens in Indonesia (intensive system)

INTENSIF

Mulai dari *day old chicks* hingga apkir, mulai dari kebutuhan yang paling kecil hingga yang terbesar, semuanya melibatkan campur tangan peternak.

Ciri sistem intensif adalah diperlukannya modal tambahan dan pengetahuan mendalam. Hasil yang diperoleh memang jauh lebih baik dan memuaskan daripada sistem pemeliharaan ekstensif.

Ayam kampung yang dipelihara secara intensif dapat berproduksi sekitar 112 butir/tahun atau sekitar 30,9% dengan umur dewasa kelamin 148 hari. Produksi telur ayam buras selama 12 minggu mencapai 43,24% *hen-day*, jumlah telur 36, 32 butir/ekor, bobot telur 30 g/butir, dan rataan bobot telur sebesar 40 g/butir.



Budi daya intensif dalam kandang baterai. Efektif untuk peternakan dengan populasi tinggi

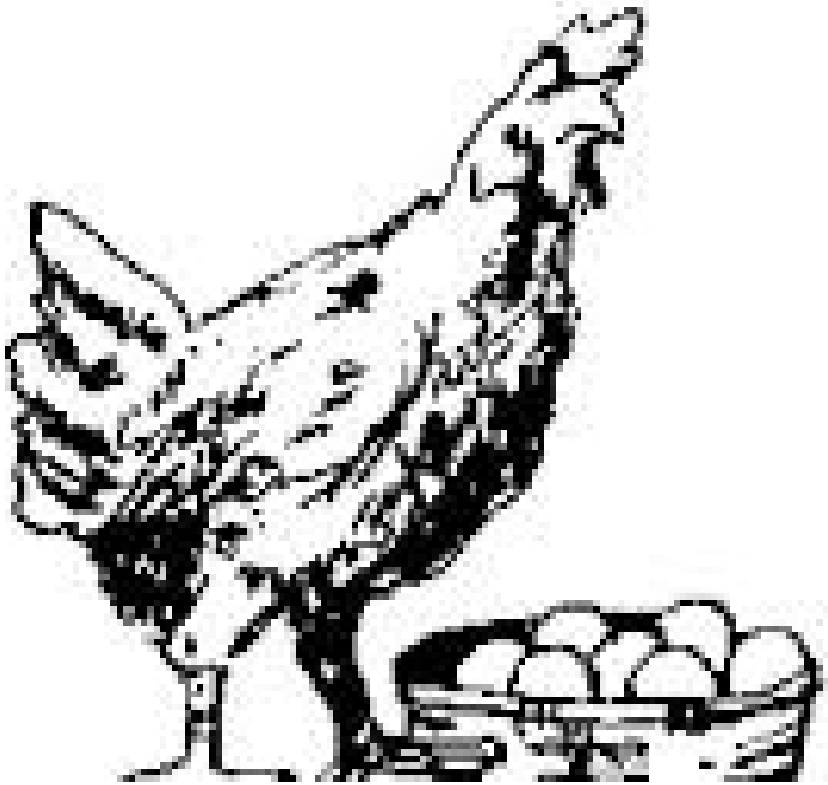
Production of Native Chickens in Indonesia

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

Egg Production
(Native Chickens vs Imported Stock)

NATIVE
CHICKEN
30-50 eggs/year



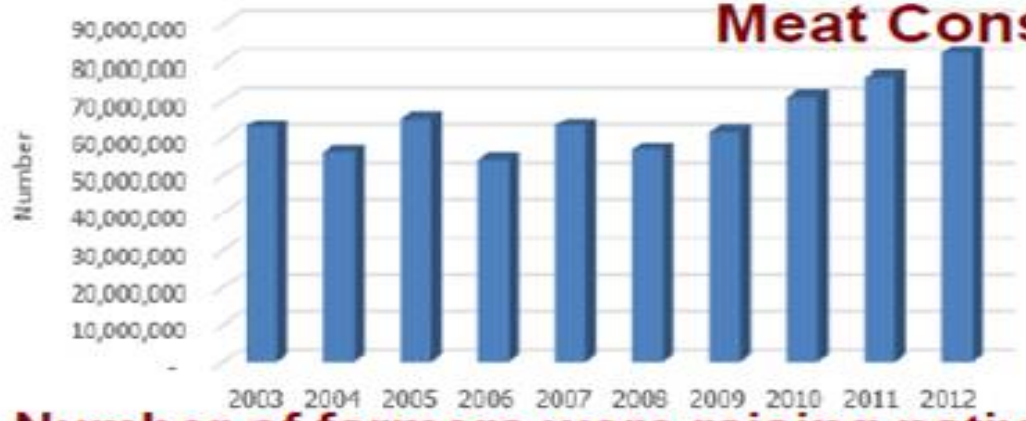
IMPORTED
STOCK
286 eggs/year

PRODUCTION SYSTEMS OF NATIVE CHICKENS IN THAILAND

About 50 percent of Thai households (6 million) in Thailand keep chickens at home and produce between 100-120 million birds a year with a mortality rate of 30 – 70% per flock. The majority (50 – 70%) of the birds and eggs produced are consumed by the family while the remainder is bartered or sold (Gruenwald, 2015). Duangjinda (2015b) reported that native chickens in Thailand increased each year with meat consumption is 4.5 kg/head/year and about 96% of population kept native chickens as food security either in small scale or commercial scale (Figure 14).

PRODUCTION SYSTEMS OF NATIVE CHICKENS IN THAILAND

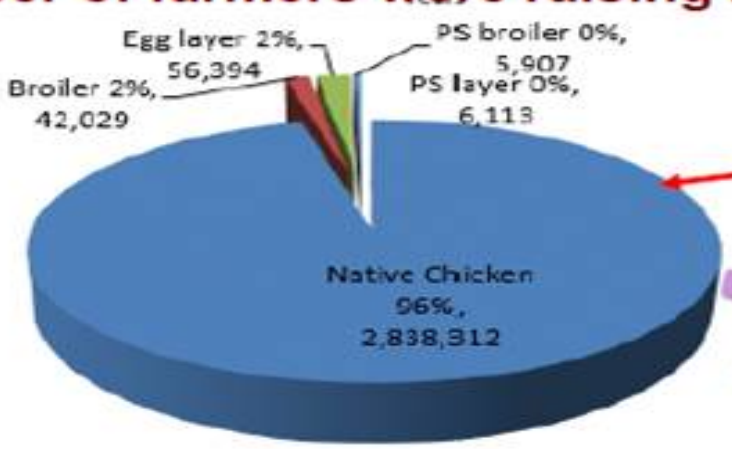
Number of native chicken in Thailand



Meat Consumption/head/year

- ✓ Beef 5 kg.
- ✓ Pork 14 kg.
- ✓ *Chicken 16 kg.*
- ✓ *Native chicken 4.5 kg*

Number of farmers were raising native chicken



PRODUCTION SYSTEMS OF NATIVE CHICKENS IN THAILAND

The currents raising systems of native chicken in Thailand divided to three systems same as in Indonesia. They are : (1) free-range of the extensive system, they were normally raised free range system and scavenging around the farm-house, (2) semi-confinement or the semi-intensive, chicken flock was then confined at night and open during the day, and (3) intensive housing system or intensive system, the typically of the raising system that the birds are kept fully in the housing either open or closing system and it was not found in the village. A large proportion of the poor people are small-scale farmers. The alleviation of poverty of resources-poor farmers becomes a multifaceted task in Thailand. About 90 – 96% of rural households in Thailand raised chickens, ranked from 5-50 birds per household. The typically of chicken are normally scavenging for natural feed around homestead and the crop field. The most popular are for chicken housing is under the house or rice storage, with the piece of bamboo railing for roosting during the night. Some villagers let their chicken roost in the tree. The chicken then normally takes care themselves in the farmhouse (Table 7; Haitook *et al*., 2015).

PRODUCTION SYSTEMS OF NATIVE CHICKENS IN THAILAND

Table 7. Effect raising systems and locations on reproduction performance of native chickens in Khon Kaen, Thailand.

Parameters	Locations		Systems			Locations vs Systems	SEM
	Backyard	Agriculture field	Free-range	Semi-intensive	Intensive		
Egg laying rate (%)	92	88	82.50	99.25	88.25	NS	0.53
Egg wheight (g/egg)	42.79	43.18	45.70	41.51	41.75	NS	5.21
Fertility rate (%)	63.42	59.72	65.97	63.89	54.86	NS	0.92
Hatchability rate of eggs (%)	61.57	54.63	64.58	59.72	50.00	NS	0.46
Hatchability rate of fertile eggs (%)	96.11	91.96	96.34	93.88	91.89	NS	1.38
Body weight of chicks (%)	33.56	33.33	34.24	31.66	34.44	NS	1.32

I C U: "The 5st Sustainable Animal Agriculture for Developing Countries", Oct. 27-30, 2015, Pattaya, THAILAND