



Feeding management of native Chickens (*Gallus gallus domesticus*) in the Ilocos Region, Philippines

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Abstract

The chicken farming system in an area imposes the feeding practices particularly in the sustainable raising of native chickens. The study was conducted to determine the feeding practices of native chicken raisers in the four (4) provinces of the Ilocos Region in the Philippines. The native chicken raisers utilize various feed resources but the most commonly used feed sources are corn grits, *palay* and kitchen left overs. The native chickens also feed on local pasture species of which the most common is *Cyperus rotundus*. During the survey on feeding management, feedstuffs identified and documented used as feeds and can be used for feed formulation includes pongapong, galiang, buga, rice midlings and coconut sapal. The native chicken raisers do not practice feed preparation and simply give the feeds in their original form; they also give commercial feeds at no exact amount. These findings will be useful in developing a sustainable feeding practice for native chicken raisers in Region I.

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Introduction

The poultry inventory in the Philippines is classified into “commercial” and “backyard”. A poultry farm is classified as “commercial” if it has more than 100 birds. Otherwise, it is classified as “backyard”. Based on this definition, backyard production of native chickens accounted for more than 50% of the total chicken inventory in the Philippines in 2005 (BAS, 2006). For many years, native chicken production in the Ilocos region has been a common livelihood for many Ilocano farmers. It provides them with additional income as well as a source of protein. It serves as a form of savings or insurance for the farmers against periodic shortages as well as for resource diversification. Nowadays, native chicken is being displaced in the supply chain by hybrid chickens. This is, however, an opportunity for small-scale farmers to raise native chickens and generate incremental benefits by supplying the emerging market for this commodity.

Native chicken or what is referred to as village or local chicken in other countries is an important source of protein food and extra income for rural farmers despite the growing popularity of imported commercial hybrid chickens. This is because of their ability to produce and reproduce even under the most marginal of environmental conditions and management. However, the business of growing native chicken is beset by a number of concerns related to production and marketing.

The issues related to production of native chicken include breeding and selection, seasonality of feedstuffs and feeding management, and disease prevention and control while market-related problems include lack of product standards and low market prices, lack of market information, lack of sources of upgraded chicken, and lack of government programs to promote and market native chickens and egg products as delicacies.

In terms of management practices, production of native chicken utilizes very little resources; as a result, output and productivity are generally low.

Native chickens are often raised under primitive conditions, without any housing, and survive by scavenging for naturally occurring feeds (grasses, insects, worms, and other edible plants and animals), fallen grains, and household refuse (Lambio, 2005).

There is also no systematic breeding or management. Therefore, the backyard sector tends to suffer from disease, insufficient feeding, lack of housing, and no selective breeding (Lambio *et al.*, 2004). It has been observed that native chickens raised under scavenging system normally produce on average 10 to 15 eggs about three to four times a year and weigh between one to one and a half kilograms at about 18 weeks of age (Lambio *et al.*, 2004).

Native chickens used to be grown in backyards and were intended for family consumption only. Hence, there was no chicken industry to speak of in the old days (Philstar Global, 2016). Evidently, there is a demand for native chicken all over the country especially now that it seems there is a shift in the taste of consumers from poultry produced with advance technology to the organically produced one. The project generally aimed to assess the suitable feeding management to optimize the production performance of Bolinao chicken in the Ilocos Region, Philippines.

Materials and methods

Using the descriptive type of research, the survey was conducted in the four (4) provinces of Region I or Ilocos Region, Philippines (Table 1 and Fig. 1) to identify feeding management for native chickens. The municipalities selected were the top producers of native chickens based on the records of the Provincial Veterinary office in each province.

One hundred (100) respondents from each of the four provinces of Ilocos Region, namely: Ilocos Norte, Ilocos Sur, La Union and Pangasinan, were selected purposively. The selected municipalities in the four provinces are presented in Table 1. The Agriculture Office of the selected municipalities assisted the project staff in the identification of the respondents.

Table 1. Municipalities covered by the survey.

Province	Municipalities
Ilocos Norte	Adams, Bacarra, Batac, Badoc, Burgos, Laoag, Pinili, Piddig, San Nicolas, Sarrat
Ilocos Sur	Bantay, Cabugao, Candon, Galimuyod, Magsingal, Narvacan, San Juan, San Ildefonso, Santa, Salcedo
La Union	Agoo, Bacnotan, Bagulin, Burgos, Luna, Naguilian, Pugo, Rosario, San Gabriel, San Fernando
Pangasinan	Anda, Asingan, Balungao, Bolinao, Burgos, Infanta, Rosales, Sta. Maria, San Nicolas

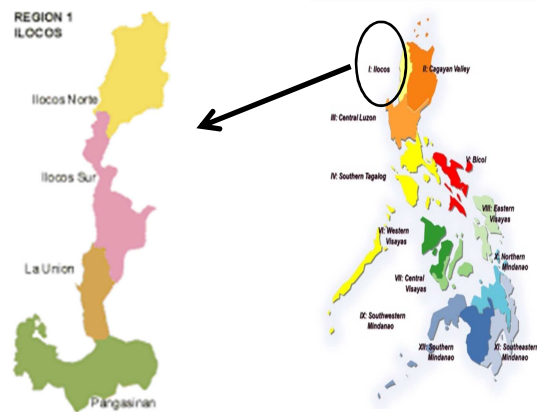


Fig. 1. Map of Region I, Philippines (Source: Google).

A structured pre-tested questionnaire was developed to contain information on feeding practices for native chickens. The questionnaire was validated by the research team in the Municipality of Bolinao, Pangasinan, Philippines as basis in the improvement of the survey questionnaire. The questionnaire aimed to document the feeding sources and to identify the different feed resources utilized by the raisers.

One hundred (100) native chicken raisers from each of the four provinces were selected as respondents. The respondents were selected based on the records of the Agriculture Office of the identified municipalities. The basis for the selection of respondents includes the following: had been raising native chickens for at least 5 years and maintain at least 5-hen population. Data gathered from the questionnaire were tabulated and statistically analyzed using means and percentages. The data on pasture species were ranked based on the number of responses for that particular pasture species.

Results and discussions

Feed Resources

Result of the survey shows that the native chicken raiser respondents in Region I utilized several feed resources for their chickens as shown in Table 2. Majority (54.25%) of them feed their native chickens with corn grits. The region is a major corn grower and as such, part of the harvest is set aside to feed their animals. Corn is an energy source but low in protein. Next to corn, almost one-half (42%) of the respondents provided *palay* to their chickens and 36.25% used kitchen left overs. In many parts of the country, native chickens may be fed with regular feeds such as ground corn, rice hull, rice bran, copra meal, rice grits, corn bran, and even kitchen leftovers like rice, bread, and desiccated coconut (Lopez *et al*, 2014). In other countries cereal grains are mostly used to feed their naive chickens (Bakele, 2016; Moges *et al.*, 2010). Tubers are also utilized as source of energy for native chickens (Ravindran & Blair, 2014). Because of the very nature of native chickens, they are normally raised to scavenge, any available feed resource as a by-product of the raisers’ farming system is utilized as feed. Despite the type of feed resources given to the native chickens, they always play a vital role in providing meat and eggs as protein source for many Filipino farmers. This further proves the sustainability of native chickens despite low production inputs given to them.

Nutrient Composition of Potential Feedstuffs

Potential feedstuffs for native chickens were identified during the course of the survey. The potential feedstuffs found in the region includes: *pongapong* (*Amorphophallus campanulatus*), *galiang* (*Alocasia macrorrhiza*), *buga* (*Discorea esculenta*), rice midlings and coconut *sapal*. *Pongapong* has tubers that is an energy source and not utilized for human consumption. On the other hand both *galiang* and *buga* produce tubers that can be consumed by human beings, however, their potential as energy source can be explored for poultry feeding. Rice midlings and coconut *sapal* are waste products that are commonly used for animal feeding. The result of the nutrient analysis showed that the crude protein content is low (Table 3)

Table 2. Native chicken production profile and feed resources for native chickens identified by the respondents

Particulars	Province				Region 1 (%)
	Ilocos Norte (%)	Ilocos Sur (%)	La Union (%)	Pangasinan (%)	
1. Native Chicken Production Profile					
a. Average Years in Raising Native Chicken	24.10	11.76	6.05	17.39	14.82
b. Average Population of Native Chicken per respondent					
Rooster	3	4	3	4	4
Hen	9	8	7	9	8
Grower	7	10	11	10	10
Chicks	12	12	12	15	13
c. Percentage of Raisers who provided Housing					
Yes	62	85	96	91	83.5
No	38	15	4	9	16.5
2. Feed Resource*					
Corn grits	11	90	98	18	54.25
Palay	23	68	64	13	42.00
Combination of common feed resource**	43	0	0	41	21.00
Kitchen Leftover	15	30	100	0	36.25
Palay + tubers	1	0	0	0	0.25
Palay + midlings	10	0	0	14	6.00
Rice bran	0	22	58	5	21.25
Rice midlings	0	14	54	7	18.75
Tuber	0	0	1	0	0.25
Kangkong leaves	0	0	2	0	0.5
*Multiple Responses					
**Combination of rice bran, corn grits, rice midlings					

Table 3. Nutrient composition of potential feedstuff for native chickens

Feedstuff	Nutrient Composition (%)				
	Moisture	Ash	Crude Protein	Crude Fat	Crude fiber
Buga	9.43	3.76	7.41	1.40	6.70
Galiang	8.06	4.68	4.38	1.24	2.61
Pongapong	7.51	4.36	6.00	1.49	6.68
Rice Midlings	9.29	3.62	7.36	1.44	8.30
Coconut Sapal	4.56	2.26	6.29	42.06	31.18

Pasture Species as Feed Resource

Based on the result of the survey, the raiser respondents identified different pasture species (Table 4) found in their backyard that serve as ranging areas for their chickens. Three species were identified in Ilocos Norte, 7 in Ilocos Sur and in La Union and 8 in Pangasinan. Among the plants identified, the most common in Ilocos Norte is *galot-galot* (*Cynodon dactylon*), Ilocos Sur and La Union is *barsanga* (*Cyperus rotundus*) and *kalunay* (*Amaranthus spinosus*) in Pangasinan. Native chickens are good foragers and as such they relish on any available vegetation in the ground. The presence of these vegetations serves as source of nutrients for the chickens making them survive even without feeds

given to them. Moreoften, even at minimal feeding, they are able to grow and reproduce which makes them a source of income and food for the farmers. Their ranging ability makes them adopt to harsh environment even when feeds are scarce. Native chickens are being raised on range forage on available vegetation in the backyard. These vegetations serve as a source of nutrients needed by the native chickens in order to produce meat and eggs. The availability of these species in the backyard of the farmers sustains the production of native chickens even with minimal concentrate feeds (Mananghaya, 2017).

Feeding Practices of Native Chickens

Feeding practices for native chickens varied among the four provinces of the region (Table 5). In terms of feed preparation, the majority of the raiser respondents did not perform feed preparation because they simply give the feeds in their original form as in the case of pure corn grits, pure *palay* and leftover food. On the other hand, milling by-products like rice bran are first mixed with water before feeding them to the chickens. Since rice bran is powdery, it is not practical to give them to the chickens in their raw form. Soaking them first in water will bind all the particles and is found more convenient when offered to the chickens.

Table 4. Local pasture species commonly found on the chicken range (rank).

Particulars	Province			
	Ilocos Norte	Ilocos Sur	La Union	Pangasinan
Barsanga (<i>Cyperus rotundus</i>)		1	1	3
Galot-galot (<i>Cynodon dactylon</i>)	1	7	2	
Tabtabukol (<i>Triamthema portulacastrum</i>)		2	3	
Busbusi (<i>Blaira nodiflora</i>)	3	3	5	
Carabao grass (<i>Paspalum conjugatum</i>)	2	4	6	
Dukayyang (<i>Dactyloctenium aegyptium</i>)			4	
Kalunay (<i>Amaranthus spinosus</i>)			7	1
Kangkong (<i>Ipomea aquatica</i>)		6		
Papait (<i>Mollugo oppositifolia</i>)		5		
Paragis (<i>Eleusine indica</i>)				2
Mani-manihan (<i>Arachis pintoii</i>)				6
Marakamote (<i>Ipomea triloba</i>)				4
Makahiya (<i>Mimosa pudica</i>)				5
Saluyot (<i>Corchorus capsularis</i>)				8
Marapagay				7

Table 5. Feeding practices of native chicken respondents.

Particulars	Province				
	Ilocos Norte (%)	Ilocos Sur (%)	La Union (%)	Pangasinan (%)	Region 1 (%)
<u>Feed Preparation*</u>					
Mix with water	0	40	88	46	43.50
Dry mix	0	0	0	4	1.00
Chopped leaves	0	0	2	0	0.50
No Preparation	100	87	100	79	91.50
<u>Amount of Feeds Given</u>					
<i>Rooster</i>					
25 grams & below				16	4.00
26 – 50 grams		33		25	14.50
51 – 75 grams				8	2.00
76 – 100 grams				33	8.25
101-125 grams				-	0
126-150				9	2.25
No exact amount	100	67	100	9	69.00
<i>Hen</i>					
25 grams & below					
26 – 50 grams		33		25	14.50
51 – 75 grams				11	2.75
76 – 100 grams				31	7.75
101-125 grams				2	0.50
126-150				22	5.50
No exact amount	100	67	100	9	69.00
<i>Grower</i>					
25 grams & below				7	1.75
26 – 50 grams		33		18	12.75
51 – 75 grams				9	2.25
76 – 100 grams				29	7.25
101-125 grams				3	0.75
126-150				22	5.50
No exact amount	100	67	100	12	69.75
<i>Chicks</i>					
25 grams & below				5	1.25
26 – 50 grams		33		23	14.0
51 – 75 grams				3	0.75
76 – 100 grams				29	7.75
No exact amount	100	67	100	40	76.75
<u>Give commercial feeds</u>					
Yes	80	39	16	53	47.00
No	20	61	84	47	53.00
<u>Frequency of Feeding Commercial Feeds</u>					

Particulars	Province				
	Ilocos Norte (%)	Ilocos Sur (%)	La Union (%)	Pangasinan (%)	Region 1 (%)
Once	13.75	2.56	37.50	30.20	18.08
Twice	83.75	74.36	56.25	66.03	74.47
Thrice	2.50	23.08	6.25	3.77	7.45
<u>Amount of Commercial Feeds</u>					
<i>Rooster</i>					
25 g below				3.77	1.06
26 – 50 g		30.77		3.77	7.45
51 – 75 g					0
76 – 100 g				3.77	1.06
No exact amount	100	69.23	100	88.69	90.43
<i>Hen</i>					
25 g below				3.77	1.06
26 – 50 g		30.77		3.77	7.45
51 – 75 g					0
76 – 100 g				3.77	1.06
No exact amount	100	69.23	100	88.69	90.43
<i>Growers</i>					
25 g below				1.89	0.53
26 – 50 g		30.77		9.4	9.04
51 – 75 g				1.89	0.53
76 – 100 g				3.77	1.06
No exact amount	100	69.23	100	83.02	88.84
<i>Chicks</i>					
25 g below				1.89	21.28
26 – 50 g				33.96	9.57
51 – 75 g				7.55	2.13
76 – 100 g				7.55	2.13
No exact amount	100	100	100	49.05	64.89
<u>Give supplement</u>					
Yes	9	77	69	47	50.50
No	91	23	31	53	49.50
<u>Name of supplement</u>					
Water soluble antibiotics	100	100	95.65	100	98.50
Electrolytes	0	0	4.35	0	1.50
<u>Frequency of giving Supplement</u>					
Once a week		89.61	68.11	74.47	40.60
Twice a week				23.40	5.45
Thrice a week		10.39		2.13	0.50
Once a day	100		8.70		37.12
Twice a day					3.96
Once a month			2.90		1.00
Occasional			20.29		11.37

From the identified feeds (Table 4) given to the native chickens, majority of the respondents in the region do not know the amount given to their chickens (rooster, hen, growers and chicks). A common practice is to simply give any amount enough to sustain the birds. In Pangasinan, however, the raiser respondents were able to quantify the amount of feeds given to their chickens. This practice is an indication that native chicken raisers value the inputs of production by knowing the amount which later on will become the basis in the computation of production cost.

Aside from the above feed resources, a large majority (80%) of the raiser respondents in Ilocos Norte gives commercial feeds to their native chickens twice a day at no exact amount. Majority (53%) in Pangasinan gives commercial feeds twice a day at various amounts. This is similar to the case in Ethiopia where native chickens were provided with a small amount of supplementary feeds (Desta & Wakeyo, 2012; Bakele, 2016). On the other hand, majority of the raiser respondents in Ilocos Sur and La Union give supplements to their chickens in the form of water-soluble antibiotics (Table 5).

The findings show that the respondents gave important attention to the health status of their chickens. Although native chickens are raised in the backyard, the raisers would aim to produce healthy chickens. Related findings by Lopez Jr , RV, (2014) showed that most raised native chickens traditionally in the range and do not provide housing but feed them twice a day with farm products and by-products by broadcasting on the ground. Drinking water is provided once a day in improvised water trough without supplementation.

In similar studies on feeding management conducted by Sulinthone (2006) and Lopez (2014), almost all of the respondents (99.1%) provide feeds to native chickens like rice, corn, *palay* and grated cassava. These were commonly given to the chickens by the majority of the respondents (59.2%) while some of them (16.7%) also used farm by-products such as rice bran and rice middling (5.6%), and domestic leftovers (0.9%). Only few raisers (10.2%) gave commercial feeds. Feeding the chickens twice a day is generally practiced by more than half of the farmers (58.3%). Such practice allows the farmers to inspect their flock and provide them the means to acquaint their chickens with the people in their farms/houses. Provisions of feeds in the afternoon encourage the chicken to return to their roosting grounds. Similar practices have been observed by Magpantay (2006). However, in other parts of the country particularly in Camarines Sur, Onate (1991) explained that they feed

their native chickens only once a day. Broadcasting the feeds on the ground is practiced by the majority of the raisers (74.1%). Such a method seemed to be more advantageous since the chicks and growers alike can eat more feeds.

Feeding Equipments

Result of the study showed that 35.50% of the raiser respondents in the region do not use any feeding equipment. Such practice allows the chickens to scratch the ground, a natural behavior they are used to. The respondents also used locally available materials as feeding equipment which includes bamboo, old plate, coconut shell, tire and buckets. There are many indigenous fixtures derived from used light materials and recyclable industry wastes. These fixtures are commonly used by farmers in livestock and poultry production. Bamboo and used tires are common materials for this purpose. Similarly, studies conducted in Batangas and Camarines Sur indicated that majority of raisers provide clean drinking water to their chickens once a day in improvised drinking trough such as shells of giant clams, coconut shells cult into half, plastic containers, basins and old tires cut into half. Majority do not supplement the drinking water with vitamins or antibiotics. Onate (1991) and Sulinthone (2006) observed in Camarines Sur and Batangas, respectively those raisers also provide drinking water to their chickens once a day.

Table 6. Feeding Equipments Used by the Native Chicken Respondents.

Type of feeder	Province				Region I (%)
	Ilocos Norte (%)	Ilocos Sur (%)	La Union (%)	Pangasinan (%)	
Split bamboo	13	18	61	19	27.75
Coconut shell		2		24	6.50
Old plate	9	23	34	6	18.00
Tire	18	8			6.50
Bucket	14				3.50
Plastic bottle	4				1.00
Plywood			3		0.75
Aluminum bowl			2		0.50
None	42	49		51	35.50

Conclusions

The study identified feedstuffs and feeding management for the native chickens in Region I, Philippines . As a ranging animal, the most common

native pasture species foraged by native chickens are *Cyperus rotundus*, *Cynodon dactylon*, *Amaranthus spinosus*, *Triamthema portulacastrum* and *Blaira nodiflora*.

Among the feeding management for native chicken were (1) giving of commercial feeds to no exact amount; (2) feeds simply placed on the ground during feeding; and (3) few are using split bamboo and old plates as feeding equipment. Despite the very minimal feed inputs, the native chickens were able to survive making them very sustainable in the region. Using the available feed resources of the native chicken raisers coupled with their feeding practice, an improved farmer's practice can be devised and be subjected to performance test versus the farmer's practice as a basis for recommendations to improve native chicken performance.

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Conflict of interest statement

The authors declare that there is no conflict of interest in the conduct of the study.

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