

Production Management System and Phenotypic Characteristics of Native Goats in Capiz and Iloilo, Philippines

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Abstract

This study was conducted to gather information for the production management system and the phenotypic characteristics of native goats in the provinces of Capiz and Iloilo. Five selected towns from Capiz and six towns in Iloilo were randomly chosen as the study sites. Within each municipality, 8 barangay were chosen with 8 respondents having a total of 704 respondents using formula utilized by Slovin. Descriptive statistics and techniques for categorical data analysis were used in the interpretation of the results. Majority of goat raisers in Capiz and Iloilo are small scale farmers, rice farmer, tenants, grazing native goats in hilly areas with natural vegetation, confined goats at night, and did not restrict the feeding and watering system. Native goats in two provinces were both resistant in several diseases, parasitic infections and other animal threats. Native goats in the two provinces were having a smooth, plain and brown hair coat, straight horn shape, and erect ears. All native goats both in Capiz and Iloilo are under small scale farming system but with slight variations in the phenotypic characteristics.

Keywords: characteristics, management system, native goats, phenotypic, production

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Introduction

The continuing growth of population in the Philippines and rapid economic development, which brings about higher per capita income, contributes to a rapid increase in the demand for animal protein. The demand of goat meat is also increased because of the increasing numbers of goat restaurants (kandingan). An increase in goat population can meet the demand gap as goat grows and multiply fast.

Majority of the goat population are in the hands of the small-scale farmers who contribute to raise these animals as their main source of livelihood (PCAARRD, 2014). Raising goat by small-scale farmers is compatible with sustainable agriculture. Raising of goat are vital for food availability or security and poverty alleviation of small-scale farmers because goats are hardy and well adapted to harsh climate and has the ability to produce quality meat. Goats require smaller capital investment than cattle (Tacio, 2017).

Philippine native goats dominate the goat population in the Philippines and are raised primarily for their meat (chevon). Due to their early sexual maturity, short gestation, short kidding or reproductive intervals and lower capital requirements compared to cattle and carabaos, Philippine native goats are considered important genetic resources (Bondoc et. al, 2002).

However, because of the growing demand of goat meat, goat raisers tried to improve the productivity of the local kambing by upgrading the stock. In short, the native goats are crossbreed with different imported breeds like Anglo Nubian, Saanen, Toggenburg, Boer and La Mancha. Thus, the Philippine native goat germplasm is under constant threat of replacement by the transfer of genetic material from exotic breeds (DA-BAR, 2004). Thus, the government made a plan to make a priorities studies on the native animals conservation, which was implemented by the different funding agencies. One of the study that fits to this agenda is through getting the phenotypic characteristics of native animals.

Phenotypic characterization of animal genetic resources for food and agriculture is the practice of systematically documenting the observed characteristics, geographical distribution, production environments and uses of these resources (FAO, 2011). It contributes in the breeding programs which enables the breeders to achieve a particular traits found on the animals. In Western Visayas, the Department of Agriculture Regional Office has not yet established data for the phenotypic characteristics and the production management system in native goats of the region.

Thus, this study was conducted to gather information for the production management system and measure the quantitative and qualitative phenotypic characteristics of native goats in the provinces of Capiz and Iloilo. The obtained information will serve as baseline data for the native goat phenotypic characteristics

Methodology

The Provinces of Capiz and Iloilo represent the study area. Random sampling of 5 towns from Capiz and 6 towns in Iloilo were taken. The study conducted in top eight barangay (four from upland area and four from lowland area) with a high number of goats raised.

A stratified multi-stage survey of respondents was used to gather information on native goat production management system and phenotypic characteristics. Within each municipality, 8 barangay were chosen, 50% for the upland and 50% for the rain fed environment. In each barangay, 8 respondents were chosen having a total of 704 respondents using the formula utilized by Slovin. Structured questionnaire was used in the gathering of data from the respondents. Descriptive statistics and techniques for categorical data analysis were used in the interpretation of the results. From each of the study sites, the following data were gathered under the category below:

Production Management System of Native Goats in Capiz and Iloilo

The physical, social and economic environment, and resources required for goat production was documented at every sample site. This includes the socio-demographic and socio-economic profile of the goat raisers, support services, membership of any farmer organizations, dispersal program, and training/seminars that the goat raisers avail. Natural environment of native goats which are important in production system were the terrain features and surface conditions of the area, production type, level of confinement, climate modifiers, type of holding, feed and water availability, and the control of diseases, parasites and other threats to health and mating practice were also noted. Productive and reproductive parameters of native goats were also gathered in the study that includes herd and flock size, age of doe at first kidding, number of kids born, and number of kids weaned from last kidding.

Phenotypic Characteristics of Native Goat in Capiz and Iloilo

Qualitative and quantitative phenotypic characteristics of native goats were gathered in the study. Qualitative variables include back profile; hair coat color, length and type; presence of horn and beard; horn shape and orientation, facial and rump profile and ear orientation. Quantitative variables documented were the body length, height at wither and chest girth, horn and ear length for both male and female native goats. Physical and linear measurements were taken only from a representative set of adult animals. Pictures of live specimen were taken using digital camera for purposes of documentation.

Results and Discussion

Production Management System of Native Goat in Capiz and Iloilo (See table 1)

Table 1. Production Management System of Small Holder Goat Farms in Capiz and Iloilo

	Description	Capiz	Iloilo
Socio-Demographic and Socio-Economic Profile of the Respondents			
Civil Status	Married	91%	95%
Age	41-45 years old	25%	22%
Educational Attainment	High School Graduate	21%	36%
	Elementary Level		
Source of Income	Rice Farming	58%	54%
Monthly Income	2000 pesos below	37%	49.5%
Number of Years Raising	1-5 years	67.2%	68%
Tennurrial Status	Tenant	54%	66%
Size of the Farm	Less than 1 hectare	94.7%	96%
Land Utilization	Rice	71.25%	86%
Road Condition	Rough Road	68%	65%
Problems in Marketing	No problem	100%	100%
Markets Target	Local Market	100%	100%
Support Services, Membership of Any Organization, Dispersal Program and Training/Seminar			
Support Services	Yes	57%	97%
Membership of Any Organization	Yes	57%	97%
Dispersal Program	Yes	57%	97%
Training/Seminar	Yes	6.25%	32.81%
	No	93.75%	67.19%
Natural Environment			
Terrain Features	Hilly	43%	71%
Surface Conditions	Open Grassland	55.31%	69%
Native Goat Production System, Level of Confinement, Climate Modifiers, and Type of Holding Production System			
a. Grass land Based System	Pastoralist (Grazing)	100%	100%
b. Mixed System	Crop – Livestock	88.44%	60%
	Agro - Pastoralist		
Level of Confinement	Confined only at Night	93%	98%
Climate Modifiers	Housing (not completely controlled)	50%	62%
Type of Holding	Peasant Farm (Small scale Farm)	100%	100%
Feed and Water Availability			
Access to Drinking Water	Not restricted	93%	98%
Feed Availability	Not restricted	76.56%	78.91%

Table 2. Continued

	Description	Capiz	Iloilo
Control of Diseases, Parasite and Other Threats to Health			
Vaccination Program	Never	100%	100%
Ectoparasite Control and Prevention	Never	95.31%	89.84%
	Occasionally	4.69%	10.16%
Endoparasite Control and Prevention	Never	87%	93%
	Regularly	12%	6%
Veterinary Treatment When Sick	Never	95.31%	89.84%
	Occasionally	4.69%	10.16%
Traditional Treatment When Sick	Never	76.56%	78.91%
	Occasionally	17.19%	17.5%
	Regularly	6.25	6.51%

Socio-Demographic and Socio-Economic Profile of the Goat Raisers

Result of the study revealed that majority of goat raisers in Capiz and Iloilo were married, 41-45 years old, high school and elementary level, rice farmer and with monthly income of 2000 pesos and below. Many of the respondents raised native goat for about 1-5 years, tenants for less than 1 hectare of land which they cultivated and utilize in rice production as their main source of income.

More than one-half (66%) of the native goat raiser in both provinces were having a rough road condition from their farms going to market. All (100%), however, claimed that they have no problem in marketing their native goat because they don't need to go to the market, for majority of buyers bought their animals at their farms.

Support Services, Membership of Any Farmer Organizations, Dispersal Program, Training and Seminars

The study shows that majority (73%) of the native goat raisers in both provinces of Capiz and Iloilo receives support services from the government, member for some farmer organizations, and avail the dispersal program. Many (79.26%) of them, However, claimed that they had no formal training and seminar in native goat farming.

Natural Environment of Native Goats

The study revealed that more than one half (58%) of the native goat raisers raised their native goats at hilly area and in flat area (30%) with the presence of natural vegetation (open grasslands) (49%).

Native Goat Production System

Result of the study shows that all (100%) native goat raisers in both provinces of Capiz and Iloilo practiced the pastoralist way of grassland based system and crop – livestock production in the mixed production system (62%).

Level of Confinement

The study revealed that majority (95%) of the native goat raisers practiced the confinement of their native goat only at night and tether/ graze it at day. While there were few (5%) raisers that practiced continuously unconfined their native goats by freely allowing it to roam around.

Climate Modifiers and Type of Holding

More than one half (57%) of the goat raisers in two provinces answered that they provide housing but not completely controlled as climate modifiers of their native goats and all (100%) were small scale farmers (peasant).

Feed and Water Availability

Majority of the goat raisers in Capiz and Iloilo, normally practice the non restriction of drinking water, and feeding of their native goats.

Control of Diseases, Parasites and other Threats to Health

Result of the study revealed that all (100%) of the respondents did not practice vaccination and only few practice ectoparasite and endo parasite treatment, veterinary medicine assistance and treatment and also with the traditional treatment of their native goats when diseases and parasites occur. This simply shows that their native goats were resistant for the different health threats.

Productive and Reproductive Performance of Native Goats (see table 2)

Herd Size and Flock Size

The study shows that herd size of native goats are composed of breeding females, replacement females, male breeder, female kids and male kids. Majority of the herd were breeding female (37%), female kids (21%), male breeder (16%), male kids (14%), and replacement female (12%). Most of the respondents raised 1-3 heads of goat.

Table 2. Productive and Reproductive Performance of Native Goats in Provinces of Capiz and Iloilo.

Description		Capiz		Iloilo	
Herd Composition/Size	Breeding Females	253	39%	324	36%
	Replacement Female	79	12%	103	12%
	Male Breeder	103	16%	144	16%
	Female/Kids	143	22%	177	20%
	Male/Kids	75	11%	143	16%
			653	100%	891
Flock Size	1-3 heads		69.37%		84%
	4-6 heads		30.63%		16%
Common Diseases, Parasites, and other Threats to Native Goats					
Diseases (bacterial, rickettsial, viral, fungal and prion diseases).	Rare		88.43%		80%
	Frequent		10.31%		15%
	Continuously present		1.25%		5%
Ectoparasites (insects, mites, ticks, etc.)	Rare		97.81%		94%
	Frequent		2.19%		2%
	Continuously present				4%
Endoparasites (helminths, protozoa, etc.).	Rare		92.18%		81%
	Frequent		5.93%		10%
	Continuously present		1.87%		9%
Other threats including feed and water toxins, predators and other harmful animals	Rare		92.18%		81%
	Frequent		5.93%		10%
	Continuously present		1.87%		9%
Reproduction and Reproductive Strategies					
Mating Practice	Uncontrolled		69.37%		84%
	Controlled		30.63%		16%
Age of Doe at First Kidding	6-10 months		57.18%		79.4%
	11 months & above		36.56%		14.3%
Number of Kids Born for each Kidding	1		93%		89%
	2 (twinning)		7%		11%
Number of kids weaned from last kidding	1		93%		89%
	2 (twinning)		7%		11%

Common Diseases, Ectoparasites, Endoparasites and other threats to Native Goats

Native goats are known to be resistant in several diseases, parasitic infestations/infections and other animal threats. This was supported by the result of this study were majority of the respondents answers that bacterial, viral, and fungal diseases (83%), ectoparasite (96%) and endoparasite (86%) were rarely observed

among their native goats.

Method Employed for Mating Practice

Raisers in both Capiz and Iloilo answers that their method employed in mating practice during breeding season of their native goats were uncontrolled. The buck can freely visit their female goat at the grazing area and can breed their in heat animals.

Estimated Age of Doe First Kidding

More than one half (69.3%) of the goat raisers answered that the estimated age of doe at first kidding were at 6-10 months and very few (6.25%) were at 5 months and below. This results conforms to PCARRD (2011) statement where native goats sexually maturity can be observed as early as five months.

No. of Kidding Observed (Number of Kids Born)

Majority (92%) of the goat raisers in the provinces of Capiz and Iloilo answered that the number of kids they observed born in every kidding was only one and there were 8% observed twinning. This result is related to the study of Villar et. al (1984) where twinning rate in Philippine native goat is 1.35%.

Number of Kids Weaned from Last Kidding

Almost all (92%) of the native goat raisers answered that there were only one kid weaned after kidding and 8% of them answered two or twin kids.

Phenotypic Characteristics of Native Goat in Capiz and Iloilo (See Table 3)

Qualitative Variables of Native Goat

The result of the study revealed that the back profile of native goats were sloping towards the rump (89%) and very few (5%) were slope down from the wither. Nearly half (44%) from the total goats were between 1 to 2 years old and under 1 year old of age (39%). Many native goats were having a smooth hair coat (56.6%), plain hair coat color pattern (36%), and brown hair coat color type (31%).

Majority (84%) were having horns, with straight horn shape (57%), and obliquely upward orientation (76.3%). Nearly half (46%) of the native goats were having a straight and concave (42%) facial profile. Most (87%) of them were having a beard, sloping rump profile (77%), and erect ears (73%).

This data conforms to the statement of Bondoc (1998) where native goat dominant colors are black with white patches, although color combinations of black,

brown, and white are also found.

Table 3. Phenotypic Characteristics of Native Goat in the Provinces of Capiz and Iloilo.

	Description	Capiz	Iloilo
Discrete or Qualitative Variables of Native Goat			
Back Profile	Slope up toward rump	80%	96%
Estimated Age	1-2 years old	50%	46%
Body Hair Coat Colour	Plain	48%	
Pattern	Spotted		45%
Body Hair Coat Colour Type	Brown	37.2%	
	White		26.4%
Hair Coat Type	Smooth hair	60%	54%
Body Skin Color	No Pigment	79%	74%
Presence of Horn	Yes	83.75%	84%
Horn Shape	Straight	61.25%	53.4%
Horn Orientation	Obliquely Upward	70.93%	81%
Facial (Head) Profile	Straight	44.68%	
	Concave		50%
Beard	Yes	80%	93%
Rump Profile	Sloping	58.13%	92%
Ear Orientation	Erect	82.81%	64%
Quantitative Variables of a Doe			
Body Length	41-49 cm	49%	59%
Height at Wither	50-59 cm	53%	54%
Chest Girth	50-59 cm	58%	71.1%
Horn Length	11 cm and above	56.25%	45%
Ear Length	10 cm and above	75%	68%
Hair Length	5 cm and below	81.2%	80.5%
Quantitative Variables of a Buck			
Body Length	50-59 cm	57.5%	72.4%
Height at Wither	50-59 cm	60.31%	79%
Chest Girth	60 above cm and above	69.37%	48%
Horn Length	11 cm and above	64%	77%
Ear Length	10 cm and above	59.37%	53.6%
Hair Length	6 – 10 cm	49.06%	44.3%

Quantitative Variables of Native Goat

Based on the linear body measurement using a tape measure, body length, height from wither and chest girth, majority of the female (doe) is having a smaller body than the bucks. The adult doe body length and height from wither has a range of 41-49 cm (55%) while most of the adult buck has a body length and height from wither ranging 50-59 cm (56%), the adult doe chest girth ranging 50-59 cm (65%) while most of the bucks ranging from 60 cm and above (57%). The ear length and the horn length of both male and female goat are ranging up to 10 cm and above. Majority of the female goat have shorter hair wool than male goat, a doe hair wool is ranging 5 cm below (81%) while a buck hair wool are ranging 5 cm below (46%) to 6-10 cm (45%).

The body size and length of native goats in Capiz and Iloilo is related with the findings of Kharel and Lambio (1990) where Philippine native goats has a mature body length of $55.2 \pm .3$ cm, $52.7 \pm .3$ cm and $62.6 \pm .5$ cm, respectively.

Conclusions

Majority of goat raisers in Capiz and Iloilo small scale farmers, rice farmer, tenants, raised native goats for 1-5 years, graze their native goats in a hilly areas with natural vegetation, confined their goats at night at did not restrict the feeding and watering system. The phenotypic characteristics of native goat in two provinces were: back profile of native goats were sloping up towards the rump, between 1 to 2 years old, having a smooth, plain and brown hair coat (also black and combination), having straight horn shape and obliquely upward orientation, straight and concave facial profile, some having a beard, and sloping rump profile and erect ears. Female (doe) is having a smaller body than the bucks. The ear length and the horn length of both male and female goat are ranging up to 10 cm and above. Majority of the female goat have shorter hair wool than male goat. Majority of the herd were breeding female and having 1-3 goats. Goat raisers practiced the uncontrolled mating method. Estimated age of doe at first kidding was at 6-10 months with only one kid born and weaned. Native goats are known to be resistant in several diseases, parasitic infestations/infections, and other animal threats.

Recommendations

Concerned agencies may give focus on the training and financial aspects of native goat raisers by extending them credit assistance and other financial supports which motivate them to work harder and ensure profit. Technical assistance to native goat raisers for the proper management including proper sanitation, feeding, pasture development, diseases control and prevention, and housing facilities of native goats. Supporting the dispersal program given by some municipalities may be needed to improve the management practices of the native goat raisers. Promote and create awareness on how to preserve the native goat breed in the provinces of Capiz and Iloilo. Implementing innovative way of raising native goat to the farmers may be implemented to improve native goat production.

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