PHILIPPINE SMALL RUMINANTS INDUSTRY ROADMAP 2022-2040

DEPARTMENT OF AGRICULTURE
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PHILIPPINE SMALL RUMINANTS INDUSTRY ROADMAP 2022-2040

Department of Agriculture
BUREAU OF ANIMAL INDUSTRY

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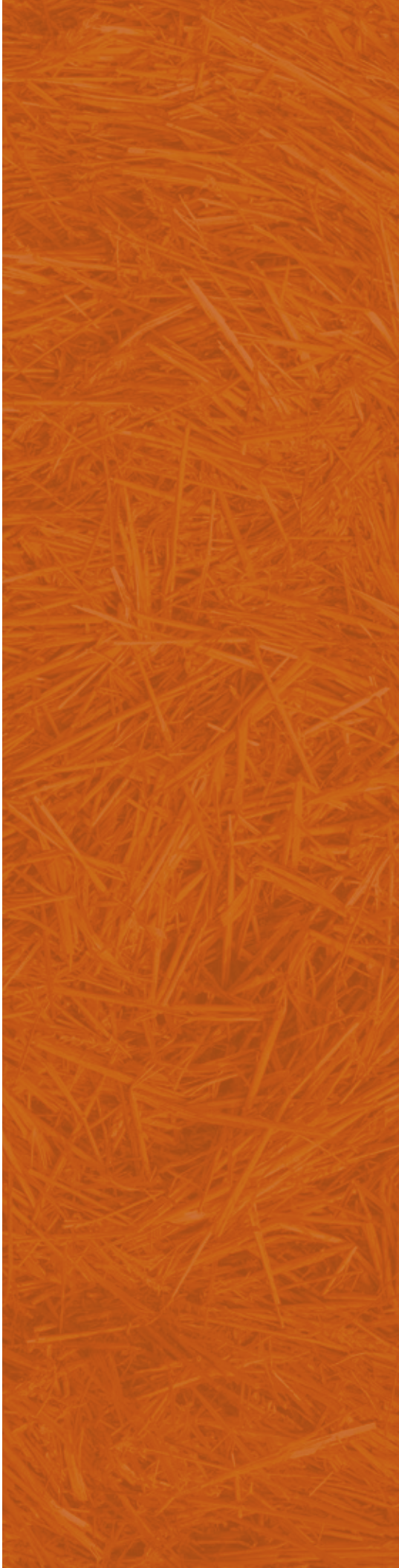

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ACRONYMS AND ABBREVIATIONS

AI	Artificial Insemination
ARMM	Autonomous Region in Muslim Mindanao
AMAS	Agribusiness and Marketing Assistance Service
ASEAN	Association of Southeast Asian Nations
ATI	Agricultural Training Institute
BAFE	Bureau of Agricultural and Fisheries Engineering
BAI	Bureau of Animal Industry
BAR	Bureau of Agricultural Research
BAS	Bureau of Agricultural Statistics
CALABARZON	Cavite, Laguna, Batangas, Rizal and Quezon
CIF	Cost, Insurance and Freight
CLSU	Central Luzon State University
CVO	City Veterinary Office
CVSRRC	Cagayan Valley Small Ruminants Research Center
DA	Department of Agriculture
DBP	Development Bank of the Philippines
DepEd	Department of Education
DOH	Department of Health
DSWD	Department of Social Welfare and Development
FAOSTAT	Food and Agriculture Organization Corporate Statistical Database
FGASPAPI	Federation of Goat and Sheep Producers Associations of the Philippines, Inc.
FMD	Foot-and-Mouth Disease
FNRI	Food and Nutrition Research Institute

FOB	Freight on Board
GAHP	Good Animal Husbandry Practices
IECs	Information, Education and Communication
IRR	Internal Rate of Return
ISU	Isabela State University
KRAs	Key Result Areas
LDC	Livestock Development Council
LGU	Local Government Unit
LOM	Livestock 'Oksyon' Market
LPS	Livestock Population Survey
MIMAROPA	Mindoro, Marinduque, Romblon and Palawan
MVO	Municipal Veterinary Office
NDA	National Dairy Authority
NGOs	Non-Government Organizations
NLP	National Livestock Program
NMIS	National Meat Inspection Service
NPV	Net Present Value
NSRRDC	National Small Ruminant Research and Development Center
OE	Operating Expenses
OIE	World Organization for Animal Health
OWWA	Overseas Workers Welfare Administration
PCAARRD	Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development
PCAF	Philippine Council for Agriculture and Fisheries
PCC	Philippine Carabao Center
PCSRP	Philippine College of Small Ruminant Practitioners
PHilMech	Philippine Center for Postharvest Development and Mechanization

PNS	Philippine National Standards
PPR	Peste des Petits Ruminants
PSA	Philippine Statistics Authority
PVO	Provincial Veterinary Office
RFO	Regional Field Offices
ROI	Return of Investment
SR	Small Ruminants
SRC	Small Ruminant Center
SUCs	State Universities and Colleges
SWOT	Strengths, Weaknesses, Opportunities and Threats
TESDA	Technical Education and Skills Development Authority
TMT	Thousand metric tons
VCA	Value Chain Analysis
SMFP	School Milk Feeding Program
SMP	Skimmed Milk Powder
SSG	Special Safeguard Mechanism
SUCs	State Universities and Colleges
UHT	Ultra High Temperature
UNDP	United Nations Development Program
UNAIP	Unified National Artificial Insemination Program
UPLB	University of the Philippines at Los Baños
US	United States
USDA	United States Department of Agriculture
USDA FAS	USDA Foreign Agricultural Service
VBAIT	Village-based Artificial Insemination Technician
VCA	Value Chain Analysis

MESSAGE

The Philippine Small Ruminant Industry Roadmap 2020-2040 was crafted to help level up agriculture and achieve the Department of Agriculture (DA) vision for "a food secure and resilient Philippines with prosperous farmers and fisherfolk". This is the combined efforts of the small ruminant stakeholders to set a common vision for the next 2 decades and identify key strategies, policies, and programs that would help achieve that vision.

The main challenge of the small ruminant industry is the supply of chevon, sheep meat, and goat's milk since it cannot meet the estimated demands of the Filipinos. There is a need to improve both the quantity and quality of meat and milk produced by the small ruminants and to promote enterprise development along the value chain. Various programs, projects, and activities (PPAs) aligned to the One DA reform agenda of consolidation, modernization, industrialization, and professionalization coupled with the crafting of enabling policies shall be implemented for the realization of the set short-, medium- and long-term targets.

This roadmap will serve as a compass for small ruminant stakeholders in going to the direction that they envisioned. Established plans like this would aid in ensuring that there will be continuity in the implementation of the PPAs despite the changing political environment. The DA through its bureaus, regional field offices (RFOs), attached agencies, and corporations will support in acting on the concerns within its mandates and in ensuring that enough funds will be allotted to the PPAs specified in this roadmap.

I would like to congratulate all the men and women behind the development of the Philippine Small Ruminant Industry 2020-2040. I hope that by 2040, the small ruminant production will not be considered anymore as a sunrise industry but as a vibrant and competitive industry that helps in achieving food security in the country.

WILLIAM D. DAR, Ph.D.
Secretary
Department of Agriculture

FOREWORD

Small ruminant livestock, primarily sheep and goats, are spread widely across the regions of the world. Goats and sheep thrive most on mixed farms and rainfed systems. Hence, on a global scale, it is not surprising that a large proportion of the total population of goat and sheep are more often than not found in Africa and Asia. Being among the first livestock domesticated by humans, small ruminants have been a steady source of meat, milk, and fiber for sustenance. In addition, there are instances where produce from small ruminants serve as a buffer against imminent impact of environmental fluctuations reducing the risks to farmers. This makes small ruminants produce invaluable assets to most poverty-stricken families.

In the Philippines, the small ruminant livestock industry exhibits a steady yet budding growth and expansion rate. As a matter of fact, the World Organization for Animal Health (OIE) has proclaimed the country as Peste des Petits Ruminants (PPR)-free and Foot-and-Mouth Disease (FMD)-free without vaccination with all its zones equally recognized. However, just like any other promising industry, the small ruminant livestock industry also faced challenges. Currently, the supply of chevon, sheep meat, and goat's milk are too low compared to their estimated demands.

Working around these circumstances, the Small Ruminant Industry Roadmap brings together various innovative strategies set to address challenges and bridge identified gaps, with eyes set to an increased goat and sheep production by 30% and 175% in 2030 and 2040. The roadmap puts forward the improvement of animal genetics, nutrition, farm management, health/disease management, and the conduct of research and development studies.

The Small Ruminants Roadmap utilizes a holistic approach, where dairy goat farmers are also empowered into becoming agripreneurs through post-harvest facilities and equipment; technical and marketing assistance, and capacity building training. Furthermore, goat and sheep allied enterprises are also enjoined into this endeavor by launching massive information dissemination and awareness raising campaigns. Together, we can work hand in hand towards achieving a globally competitive and sustainable Philippine Small Ruminants industry by 2040.

WILLIAM C. MEDRANO, Ph.D.
Undersecretary for Livestock
Department of Agriculture

PREFACE

For the past several years, the Department of Agriculture (DA) through the Bureau of Animal Industry (BAI) has been spearheading the development of various livestock and poultry roadmaps. One of these is the Philippine Small Ruminant Industry (SRI) Roadmap 2020-2040.

This roadmap aims to come up with a small ruminant industry blueprint that is inclusive, stakeholders crafted and market-driven. Three (3) important questions were answered in this document.

Where are we now? Industry situation and competitiveness were analyzed using local and global scanning and benchmarking, supply and value chain analysis, and SWOT analysis, among others.

Where do we want to go? Industry goals, objectives, key result areas (KRAs), and targets for the short-, medium- and long- terms were all set with the vision of "A competitive and sustainable Philippine goat and sheep industry by 2040."

How do we get there? Strategies were identified and translated into quantitative targets and costs. Also, a list of policy recommendations in support of the programs, projects, and activities was provided.

The crafting of the SRI roadmap was never easy. It underwent a series of stakeholder consultations and consensus-building on strategies to achieve a shared vision for industry competitiveness and sustainability.

We salute all the small ruminant stakeholders who actively participated and generously shared their valuable inputs during the consultation meetings. Thank you for your unwavering support to this endeavor.

Mabuhay po tayong lahat!

NEAL A. DEL ROSARIO, Central Luzon State University Small Ruminant Center
Technical Consultant
Small Ruminants Industry Roadmap Development Team

EXECUTIVE SUMMARY

Small ruminants (SR) form an important economic and ecological niche in agricultural systems in the developing countries like the Philippines. Goat production in the country is considered as a sunrise industry. There is potential in the small ruminant industry of the Philippines especially that our country was declared by the World Organization for Animal Health (OIE) as Peste des Petits Ruminants (PPR)-free and Foot-and-Mouth Disease (FMD)-free without vaccination with all its zone equally recognized. The supply of chevon, sheep meat and goat's milk at present are too low compared to their estimated demands. The demand for goat meat may also rise since other meat sources are having problems on diseases causing a decrease in supply and increase in market prices. There is also an increasing local and global demand for HALAL meat products since Muslim population is increasing.

This roadmap aims to address major problems of the SR industry on low total production and limited productivity and hopes to increase goat and sheep production by 30% and 175% in 2030 and 2040, respectively. Strategies such as herd infusion, animal distribution, application of reproductive biotechnologies and increasing the numbers of GAHP-compliant farms are seen to address the production problem. Productivity will be enhanced by various programs targeting to improve animal genetics, nutrition, farm management, health/disease management and conduct of research and development studies. The plan also intends to not only increase the dairy goat farmers but also develop them into agripreneurs by providing them post-harvest facilities and equipment; technical and marketing assistance, and capability building trainings. Goat and sheep allied enterprises will be developed also by massive promotion using various IECs and through development of standards. Supporting policies and programs to help in the realization of the set key result areas (KRAs) were also identified. A total of PhP 8.02B and P10.46B investments of the government and private sectors, respectively are required to achieve a globally competitive and sustainable Philippine goat and sheep industry by 2040.

INTRODUCTION

Rationale

It is the vision of the Department of Agriculture (DA) to have "A food secure and resilient Philippines with prosperous farmers and fisher folk". To help realize this vision, Secretary William D. Dar set eight (8) paradigms to level up agriculture. Among these paradigms is roadmap development wherein the private sector and other stakeholders shall be consulted to solicit their inputs in generating "big ideas" for the roadmap. Private sector has more access to export markets and has the capacity to fund researches for the development of the Philippine agriculture. Different bureaus, attached agencies and corporations of the DA were tasked to prepare their respective roadmap(s) using value-chain approach that also consider the smallhold farmers.

The National Livestock Program (NLP) with a vision "A meat, egg and milk secured and resilient Philippines anchored on a vibrant, robust and globally competitive livestock and poultry industry and prosperous farmers" conforms to this directive of the DA Secretary. On June 11, 2020, Special Order 496 series of 2020 was signed by the DA Secretary to create various committees for livestock and poultry commodity roadmap enhancement and development. Among the commodity roadmaps for enhancement is the Small Ruminant Industry Roadmap- the only livestock commodity roadmap approved by the former DA Secretary Emmanuel F. Piñol. The approval was granted last July 22, 2019 on a meeting attended by key representatives of the Federation of Goat and Sheep Producers Associations of the Philippines, Inc. (FGASPAPI), the Bureau of Animal Industry (BAI), Office of the Assistant Secretary for Livestock, among others.

Small ruminants form an important economic and ecological niche in agricultural systems in the developing countries like the Philippines. Goat production in the country is considered as a sunrise industry. Goat is popularly known as the poor man's cow because children and old folks who cannot afford cow's milk prefer drinking goat's milk. Moreover,

goat's milk is more digestible compared to cow's milk. Among all animals, goats possess inherent characteristics that could provide comparative advantage in production over large ruminants, poultry and swine. Goats subsist on native and improved vegetation, have shorter estrus cycle, and high reproductive rate (multiple births). Raising them requires minimal investment while providing good returns. In a study conducted by a government agency (BAR, 2012), it was found out that goat is a multi-purpose ruminant producing 58.4% milk, 35.6% meat, 4.3% hide, and 1.7% fiber. According to the study, goat can provide the answer to improve nutritional requirements of the predominantly rural farm families scattered all over the archipelago. Chevon is lower in saturated fat than pork, chicken, and beef (Alo, 2017). It is also low in cholesterol and calories but high in protein, potassium, and iron content (Yap, 2020). In terms of health benefits, goat's milk is considered to be closer to human milk especially in terms of oligosaccharides and its influence on the gastrointestinal environment and allergy-related immune pathways compares to a cow's milk (Prosser, 2021). Moreover, there are also beauty products developed out of the goat's milk like soap, lotion and cosmetics. Goat's milk has capric and caprylic acids known to reduce the alkalinity in many beauty products resulting in a pH level suitable for a healthy human skin.

In like manner, raising sheep in the Philippines can be as profitable as raising goats in local farms. In five months, they would already give birth. If the sheep reaches the optimum weight of 18 kilograms, they can already be sold. Sheep contributes to food production, rural employment and gross national product by converting roughages into meat, wool and skin. However, raising of sheep is not common and as popular as raising goats in the Philippines. In general, most people are used to eating chevon and prefer it over that of lamb. However, some people who had eaten lamb said that it tastes better and is juicier and tenderer. At present, there are records of sheep meat exports of the Philippines to other countries.

There is potential in the small ruminant industry of the Philippines especially that our country was declared by the World Organization for Animal Health (OIE) as Peste des Petits Ruminants (PPR)-free and Foot-and-Mouth Disease (FMD)-free without vaccination with all its zone equally recognized. The supply of chevon, sheep meat and goat's milk

at present are too low compared to their estimated demands. The demand for goat meat may also rise since other meat sources are having problems on diseases causing a decrease in supply and increase in market prices. There is also an increasing local and global demand for HALAL meat products since Muslim population is increasing.

The combined efforts of the government, private sector, academe, among others is required to work on how to address the supply problem. The National Livestock Program (NLP) and the Bureau of Animal Industry (BAI) are committed to help the industry by taking on the responsibility of spearheading the drafting of their masterplan titled "Small Ruminant Industry Roadmap".

Objectives

The major objective is to come up with a small ruminant industry blueprint that is inclusive, stakeholders'crafted and market-driven. The specific objectives are to:

a. Provide a situational assessment of the small ruminant industry;

b. Set goals and strategies as well as plan targets towards a competitive and sustainable small ruminant industry, and;

c. Recommend strategic directions and action programs for short-term (2022-2025); medium- term (2026-2030) and long term (2031-2040)

Definition of Terms

ARTIFICAL INSEMINATION: The injection of semen into the female reproductive tract through the use of an instrument (example: French gun) in order for the animal to become pregnant.

AVERAGE DAILY GAIN (ADG): The amount of weight gained each day during a period of time.

BUCK (Billy): A sexually mature intact male goat used for breeding.

CHEVON: Chevon is the French word for goat. These are animals that are slaughtered near or shortly after weaning.

CROSSBRED: Sheep that are a combination of two or more different breeds. This can make them stronger for a certain environment and in some cases more disease resistant.

DAIRY GOATS: Goats that are used primarily for milk production. For more information please see the breeds section in the goat Community of Practice area.

DOE (Nanny): A sexually-mature female goat.

DRESSING PERCENTAGE: The dressing percentage is calculated by dividing the carcass weight by the live weight.

EMBRYO: Unborn offspring that does not yet have developed organ systems and is in the very early stages of development in the uterus.

EWE: Female sheep

FLEECE: The wool from one sheep

FORAGE: The hay and/or grassy portion of the diet of goats, sheep and cattle.

Lamb: The meat from an animal less than one year old.

MEAT GOAT (type): A breed of goat that is primarily used for meat production.

MUTTON: The meat from a sheep that is older than 12 months.

NUTRIENT REQUIREMENTS – The level of specific nutrients required to keep an animal healthy and productive.

NUTRITION – The study of nutrients, determining what nutrients are required, what levels of nutrients are necessary for various levels of productivity, and how to provide those nutrients.

PUREBRED: An individual whose parents are of the same breed and can be traced back to the establishment of that particular breed through the records of a registry association.

RAM: A male sheep aged over 12 months.

ROUGHAGE: A high fiber, low total digestible nutrient feed consisting of coarse bulky plants or plant parts; dry or green feed with over 18% crude fiber.

RUMINANT: Animals that have a four-compartment stomach (rumen or paunch, reticulum or honeycomb, omasum or manyplies, and abomasum or true stomach).

VACCINE: A biological product that is injected into an animal to stimulate an immunity to a particular disease.

WEANER or WEANLING: An animal that has been weaned from its mother or has stopped suckling its mother. WETHER: A male sheep or goat that has been castrated.

WOOL: Fiber that most sheep grow.

YEARLING: A male or female sheep or goat that is between 1 and 2 years of age.

Small Farm vs Medium Farm vs. Large Farm

According to BAS (2013) a commercial farm refers to any farm that satisfies at least one of the following conditions: a) At least 21 head adult animals and zero young; b) At least 41 head young animals; and c) At least 10 head adult animals and 22 head young animals.

In this roadmap, FGASPAPI categorized the small ruminant farms into small, medium and large. According to the association, those that have a doe level of less than 25 are considered small. Meanwhile, those that have greater than 25 but less than 100 doe level are considered medium. And finally, those that have more than 100 doe level are considered large.

TABLE 1. SMALL RUMINANT INDUSTRY STRUCTURE IN THE PHILIPPINES

STRUCTURE	Small	Medium	Large
Doe – level (Population)	25 and below	>25	>100
Production Management System	Extensive	Semi-intensive	Intensive
Record Keeping	Lacking	Good	Very good
Type of Operation	Meat/milk	Meat/milk	Meat/milk
2016	0.50	0	
2017	0.51	2.00	
2018	0.51	0	
2019	0.50	-1.96	
2020	0.51	2.00	
Average	0.50		

Data Sources

Data for the small ruminants' roadmap were obtained from various sources such as BAI, FGASPAPI, other goat and sheep farmers, goat and sheep traders and retailers, MADECOR/Livestock Development Council (LDC), Philippine Statistical Authority (PSA), Bureau of Agriculture and Fisheries Standards (BAFS), Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development (PCAARRD), National Meat Inspection Service (NMIS), FAOSTAT, among others. Data were obtained through numerous consultation meetings with the stakeholders; interviews with key informants [i.e. goat and sheep farmers (commercial and backyard farms), traders or "viajeros", and retailers)] for the Value Chain Analysis, Cost and Return Analysis and Competitive Analysis; and desktop research to gather information on benchmarking, market trends and prospects, among others.

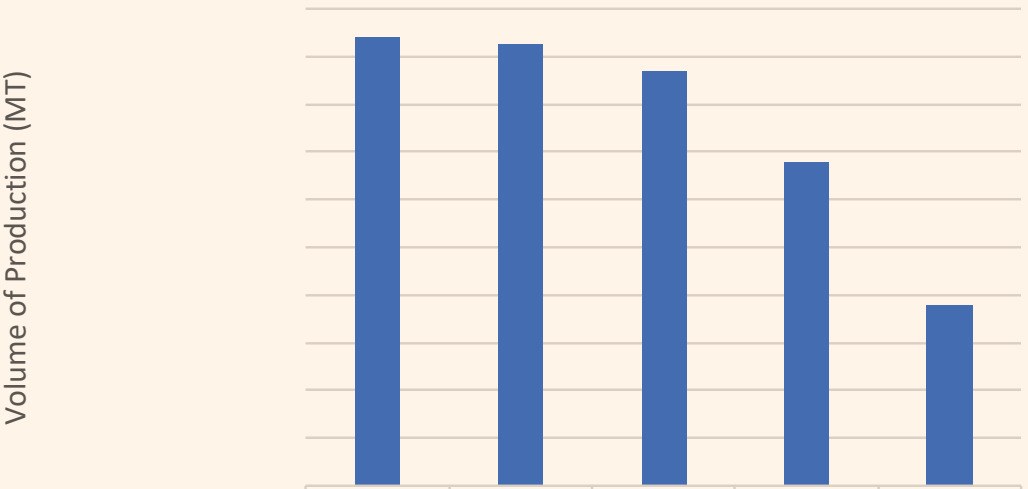
INDUSTRY SITUATION AND OUTLOOK

Goat

Production

As of 2019, 76.35 thousand metric tons (TMT) of goats were produced nationwide. This was 0.77% lower than the previous year production of 76.95 TMT. Since 2015, goat production demonstrated a downward trend.

FIGURE 1. GOAT VOLUME OF PRODUCTION OF THE PHILIPPINES, 2015-2019



	2015	2016	2017	2018	2019
Volume of Production	77,480	77,454	77,338	76,953	76,358

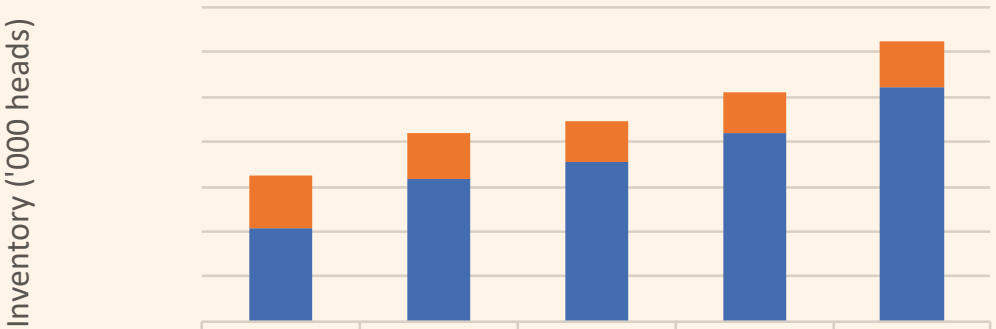
Source: Philippine Statitstics Authority

Inventory

From 2016 to 2020, goat population increased by 1.01 percent per annum. Average annual inventory stood at 3.73 million (M) heads. It can be observed that there was

continuous increase in the goat inventory since 2016. In 2020, total goat population increased by 1.52%, from 3.75M heads in 2019 to 3.81 M heads in 2020.

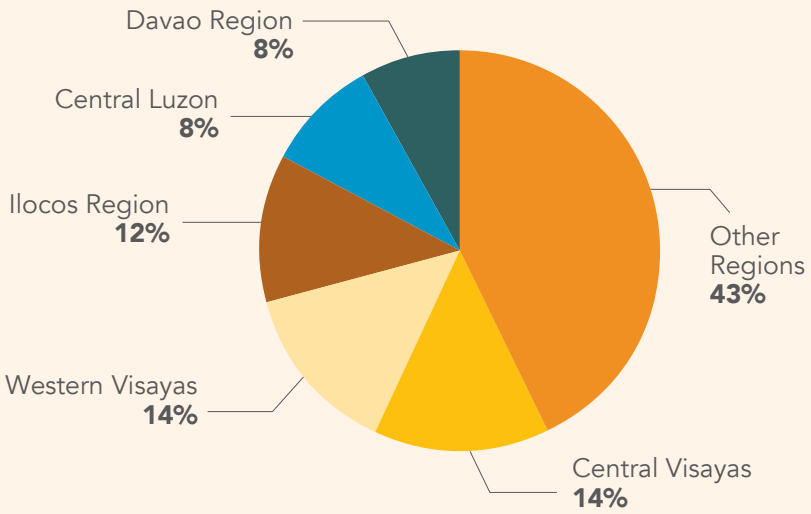
FIGURE 2. GOAT INVENTORY IN THE PHILIPPINES, 2016-2020



	2016	2017	2018	2019	2020
Commercial	58	50	47	46	51
Backyard	3604	3659	3677	3709	3761

As of January 1, 2020, the regions with highest goat inventory were Central Visayas (536,614 heads), Western Visayas (517, 049 heads), Ilocos Region (470,040 heads), Central Luzon (337,842 heads) and Davao Region (308, 013 heads).

FIGURE 3. PERCENT SHARE OF TOP-PRODUCING REGIONS IN TERMS OF TOTAL GOAT INVENTORY IN THE PHILIPPINES (AS OF JANUARY 1, 2020)

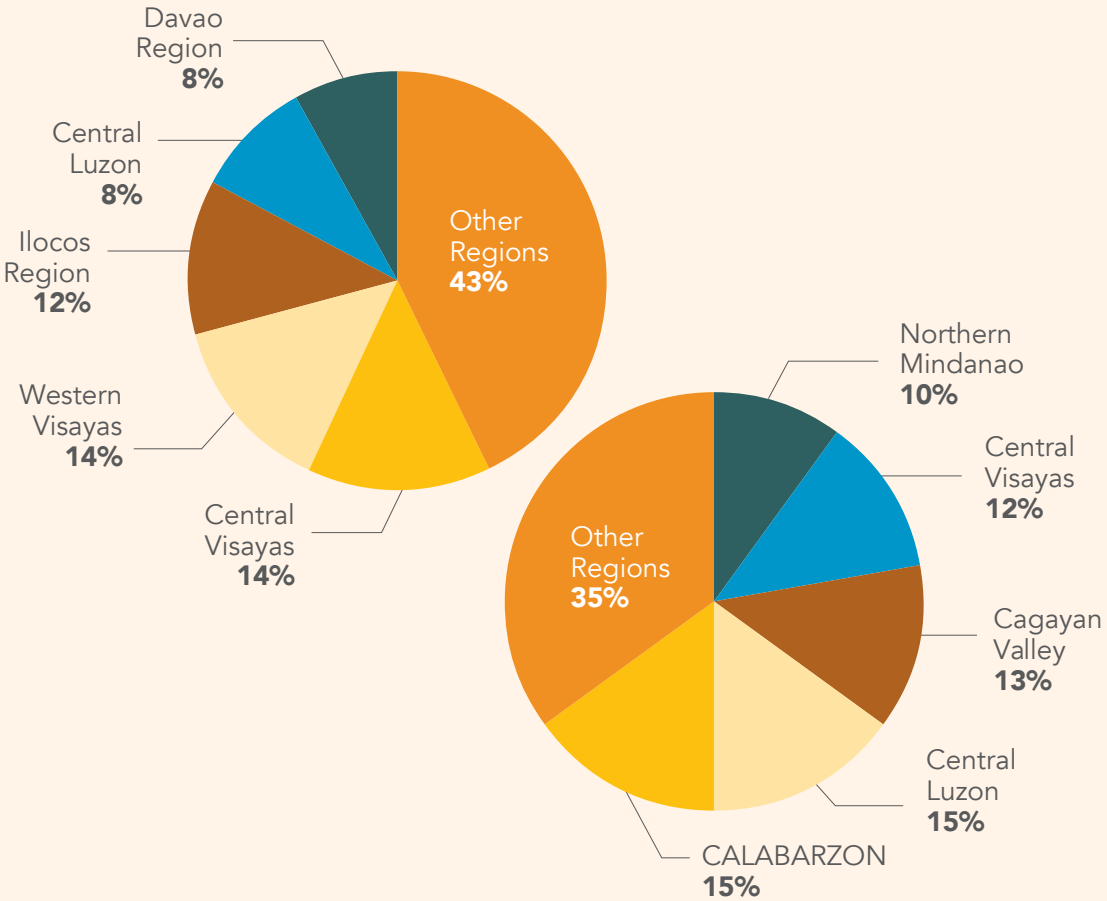


Source: Philippine Statitstics Authority

Regions that led in terms of backyard goat inventory were also the same regions that were identified as top producers of goat in the country. As previously discussed, 98.64% of the goatinventory was produced in the backyard farms. The five regions produced around 57% of the total goat population.

On the other hand, CALABARZON dominated the commercial goat production, raising 15% of the total commercial inventory. CALABARZON is near Metro Manila with the largest urban concentration. Other regions with high commercial goat production were Central Luzon (7,565 heads), Cagayan Valley (6,984 heads), Central Visayas (6, 135 heads) and Northern Mindanao (5, 134 heads). Their combined output constituted about 65% of the total commercial goat inventory.

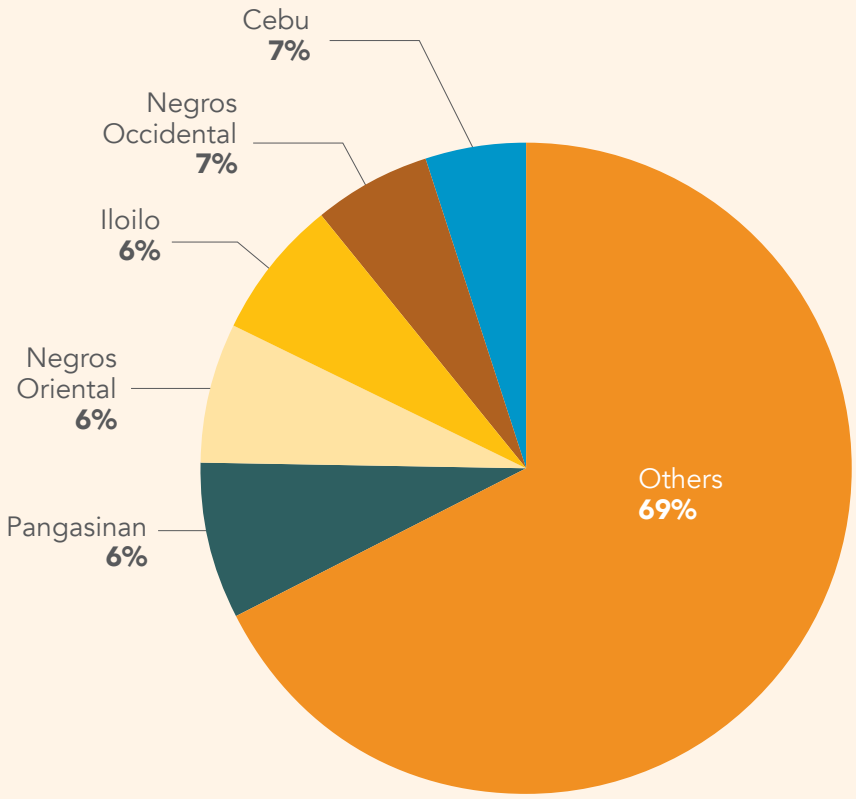
FIGURE 4. PERCENT SHARE OF TOP-PRODUCING REGIONS IN TERMS OF BACKYARD (LEFT) AND COMMERCIAL (RIGHT) GOAT INVENTORY IN THE PHILIPPINES (AS OF JANUARY 1, 2020)



Source: Philippine Statitstics Authority

On a provincial level, the major sources of goats were Cebu (234,713 heads), Negros Occidental (220,682 heads), Iloilo (208, 723 head), Pangasinan (179,046 heads) and Negros Oriental (186, 659 heads), which accounted for 31% of the total goat inventory of the country.

FIGURE 5. PERCENT SHARE OF TOP-PRODUCING PROVINCES IN TERMS OF TOTAL GOAT INVENTORY IN THE PHILIPPINES (AS OF JANUARY 1, 2020)



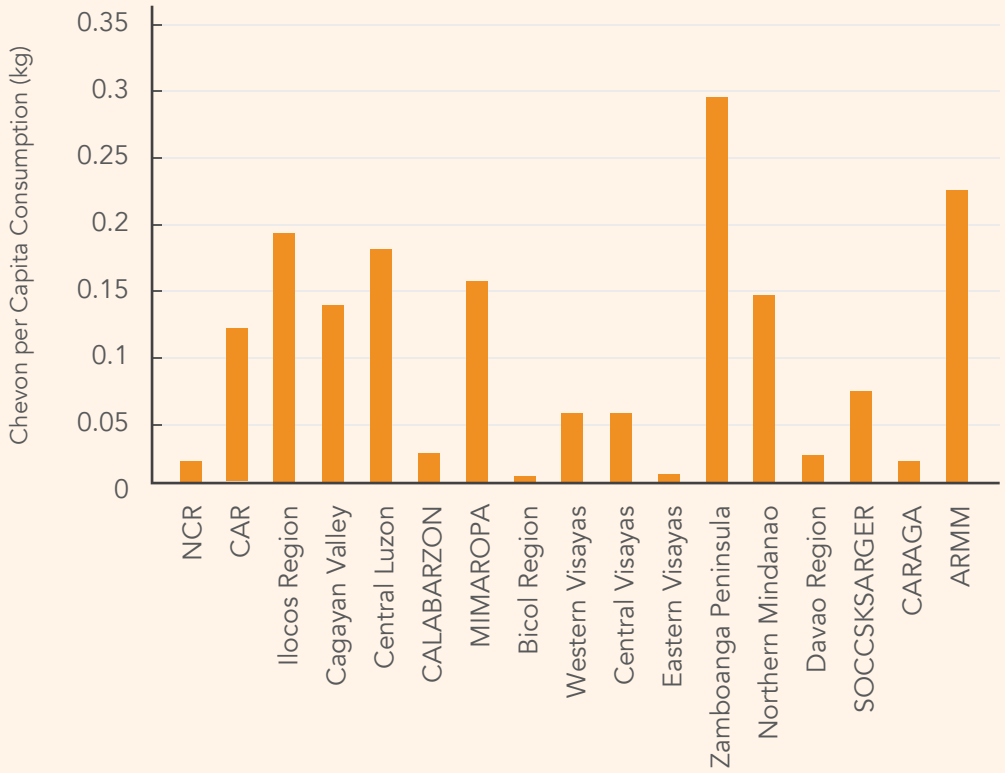
Source: Philippine Statitstics Authority

Consumption

Chevon

Average per capita consumption of chevon per region for 2015-2016 is shown in Figure 6. Highest per capita consumption was recorded in Zamboanga Peninsula, ARMM, Ilocos Region, Central Luzon and MIMAROPA with 0.298, 0.227, 0.193, 0.181 and 0.156 kg/person/year, respectively. On the otherhand, Bicol Region, Eastern Visayas and CARAGA ate the least volume of chevon on that year.

FIGURE 6. REGIONAL PER CAPITA CONSUMPTION OF CHEVON (IN KILOGRAMS), 2015-2016

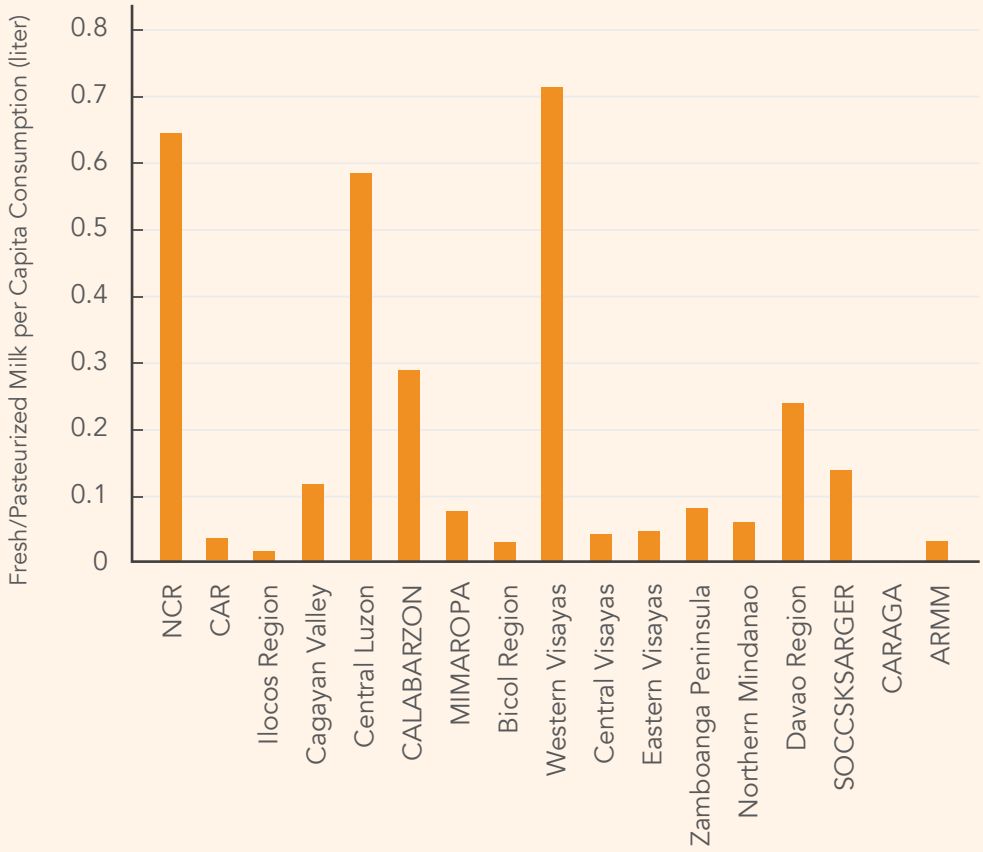


Source: Philippine Statitstics Authority

Milk

Average per capita consumption of fresh/pasteurized milk per region for 2015-2016 is shown in Figure 7. But this was not solely for goat's milk but also included cow and carabao's milk. Highest per capita consumption was recorded in Western Visayas, National Capital Region, Northern Luzon, CALABARZON and Davao Region with 0.711, 0.645, 0.583, 0.29 and 0.24 li/person/year, respectively. Ilocos Region, Bicol Region and ARMM had the lowest per capita consumption for milk.

FIGURE 7. REGIONAL PER CAPITA CONSUMPTION OF FRESH/PASTEURIZED MILK (IN LITERS), 2015-2016



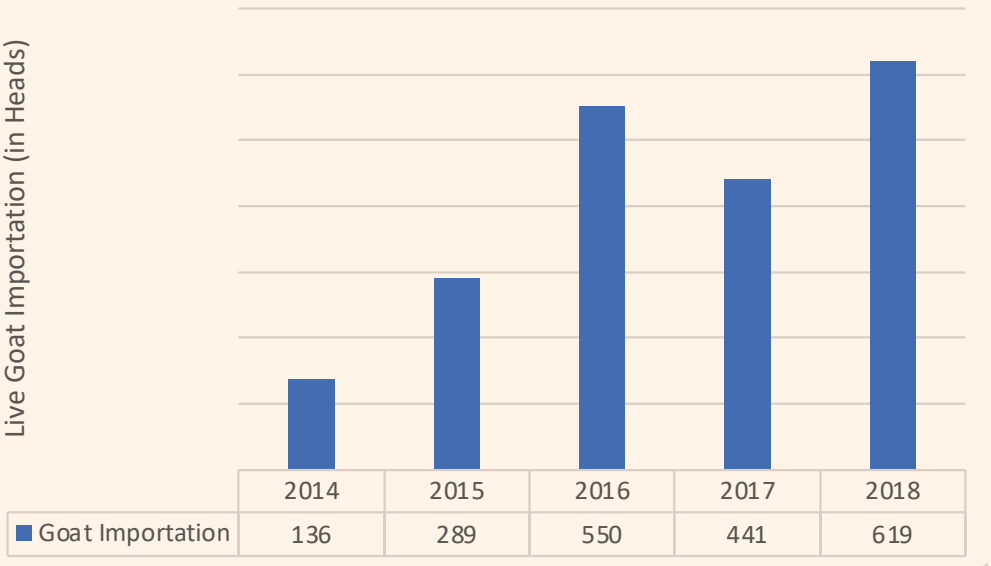
Trade (Import & Export)

Importation

Live Animal

Importation of goats is mostly for breeding purposes. An erratic trend in the importation of goats can be observed from 2014. The highest importation of goat was in 2018 with a total of 619 heads as shown in Figure 8.

FIGURE 8. LIVE GOAT IMPORTATION OF THE PHILIPPINES, 2014-2018



Source: BAI–National Veterinary Quarantine Services Division

Chevon

Existing data for chevon importation is scarce. No chevon importation was recorded from the last 5 years. Last chevon importation record was in 2014, when the Philippines imported 7,081 Kgs. meat.

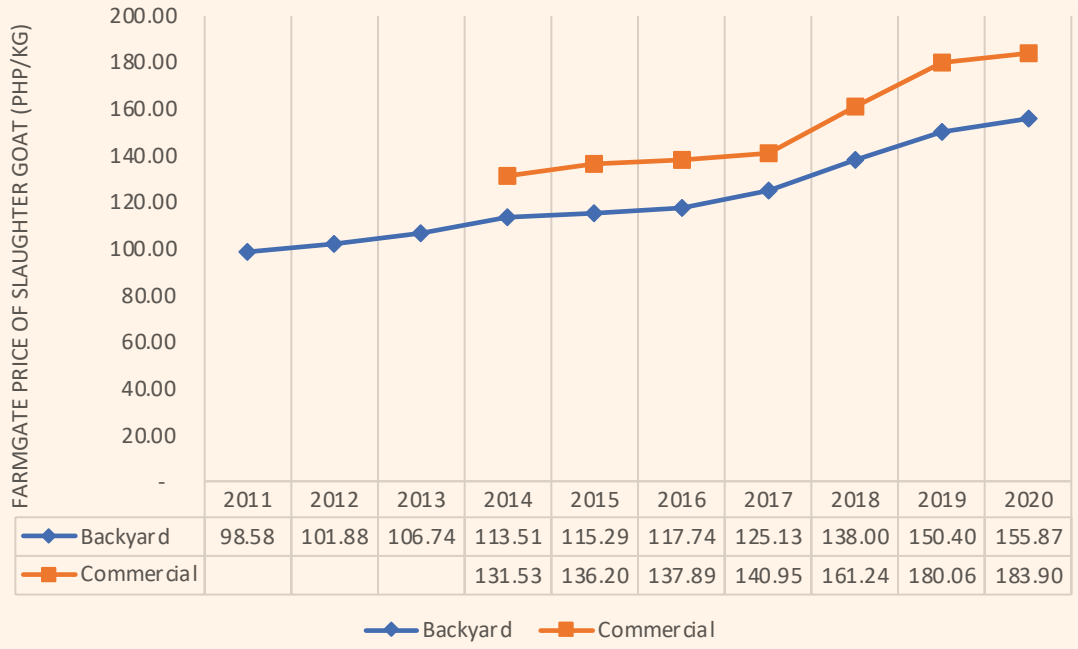
Exportation

The Philippines has no record or do not export goat (live, meat and meat products), although the Philippines has a potential to export these commodities to other countries.

Prices

Farmgate prices of goat per kilogram from 2011 to 2020 constantly increased every year. From 2011 to 2020, the price of live goat in the backyard and commercial farms per year increased by 5.26% and 5.87% on the average, respectively. Highest growth of 10.29% in backyard farms and 14.40% in commercial farms were posted in 2018.

FIGURE 9. FARMGATE PRICES OF LIVE GOAT IN THE PHILIPPINES, 2011-2020



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Backyard	98.58	101.88	106.74	113.51	115.29	117.74	125.13	138.00	150.40	155.87
Commercial				131.53	136.20	137.89	140.95	161.24	180.06	183.90

Source: Philippine Statistics Authority

Sheep

Production

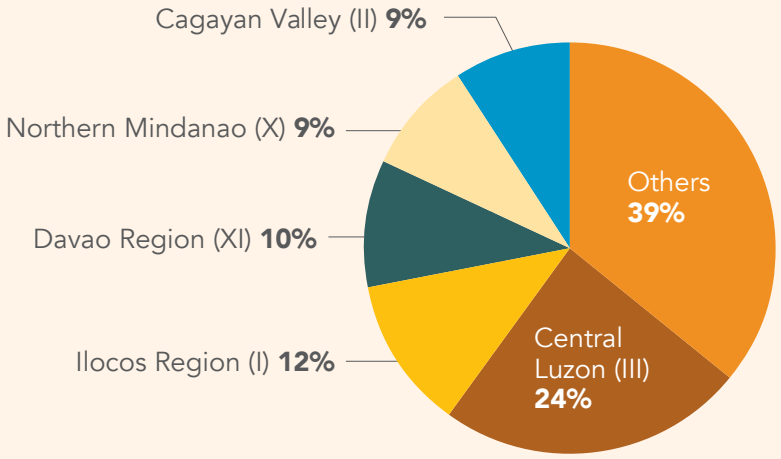
There is no available information on the volume and value of sheep production in the Philippines since sheep is not included in the data systems of the Livestock and Poultry Statistics Division (LPSD) of Philippine Statistics Authority (PSA) is not monitoring the data. They considered sheep as an emerging commodity.

Inventory

There is no much information available with regards to sheep inventory in the Philippines. Only in 2010 when the Philippine Statistics Authority was able to collect data on sheep population through a Livestock Population Survey (2010). According to the survey, the total sheep population recorded was 49,747 head as of April, 2010.

As per the LPS (2010), Central Luzon (Region III) obtained the highest share at 24%, while Ilocos Region (I) distantly followed with 12% share. Completing the top 5 regions with highest sheep population were Davao Region (XI), Cagayan Valley (Region II) and Northern Mindanao (Region X) that composed 10%, 9.1% and 8.8% of the sheep population, respectively. The top 5 regions comprised more than half of the sheep population (64%).

FIGURE 10. PERCENT SHARE OF TOP-PRODUCING REGIONS IN TERMS OF SHEEP INVENTORY IN THE PHILIPPINES (AS OF APRIL 2010)



Source: Livestock Population Survey 2010

Consumption

Sheep meat per capita consumption in the Philippines for the last 10 years was displayed in Table 2. For the span of 10 years, annual consumption of sheep meat only ranged from 0.49 to 0.52 kg/person/year. For 2020, Filipinos consumed an average of 0.51 kg/person/year in 2020, 2% higher than the level during the previous year.

TABLE 2. SHEEP MEAT PER CAPITA CONSUMPTION IN THE PHILIPPINES, 2011-2020

Year	Per Capita Consumption of Sheep Meat	Percent Change (%)
2011	0.52	
2012	0.50	-3.85
2013	0.49	-2.00
2014	0.49	0
2015	0.50	2.04
2016	0.50	0
2017	0.51	2.00
2018	0.51	0
2019	0.50	-1.96
2020	0.51	2.00
Average	0.50	

Source: https://www.statista.com/statistics/756770/philippines-sheep-meat-consumption-per-capita/

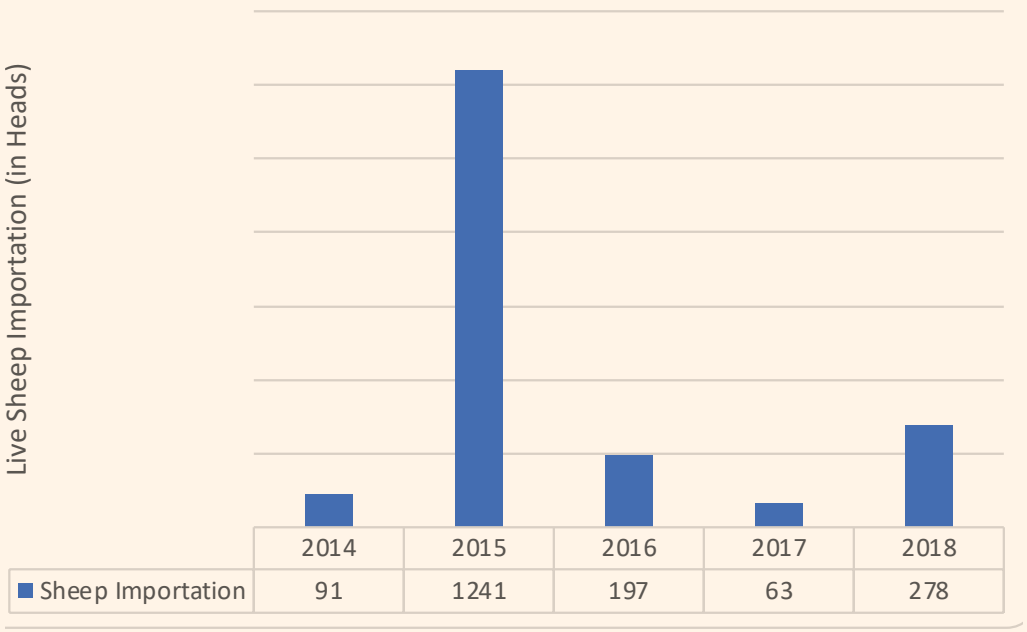
Trade (Import & Export)

Importation

Live Animal

Live sheep importation of the Philippines from 2014 to 2018 was observed to follow an erratic trend. Highest importation was seen in 2015 when the country brought in a total of 1,241 head sheep as shown in Figure 13.

FIGURE 11. LIVE SHEEP IMPORTATION OF THE PHILIPPINES, 2014-2018

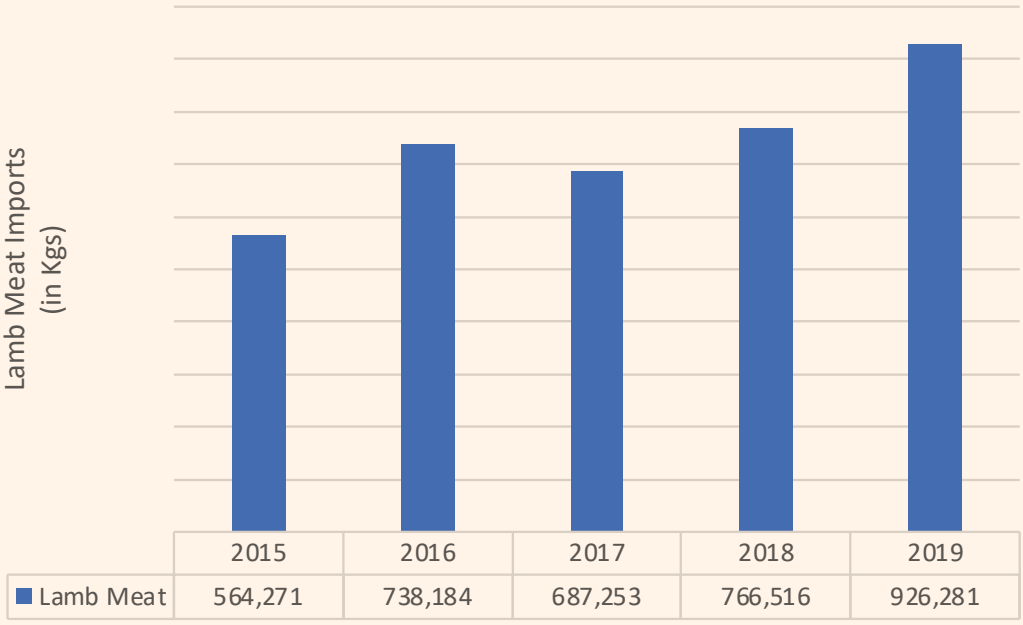


Source: BAI–National Veterinary Quarantine Services Division

Lamb Meat

Lamb meat importation had an annual increase of 14.07% from 2015 to 2019. Highest lamb meat importation was in 2019 amounted to 926, 281 Kgs.

FIGURE 12. LAMB MEAT IMPORTATION OF THE PHILIPPINES, 2015-2019



	2015	2016	2017	2018	2019
Lamb Meat	564,271	738,184	687,253	766,516	926,281

Source: BAI–National Veterinary Quarantine Services Division

There are importations of lamb offal for the years 2015, 2016 and 2017 equaled to 594 Kgs; 3,000 Kgs, and; 10,050 Kgs, respectively.

Exportation

Lamb

The Philippines has only 2 records of lamb export since 2006 (Figure 11). First importation was the 3 kg. offal export to Japan in 2012. On the other hand, the 21, 245kg. casing export in 2013 were brought to Japan and New Zealand.

Prices

Neither PSA nor the DA-Agribusiness and Marketing Assistance Service (AMAS) has record of domestic prices of sheep.

ANALYSIS OF THE SMALL RUMINANT INDUSTRY

Value Chain Analysis

Small ruminant supply chain is basically comprised of input and services supply (i.e. feeds, veterinary and artificial insemination services), small ruminant production, primary processing (i.e. carcass production) and marketing.

Input Supply

Supplier of animal feeds, veterinary and artificial insemination services are the actors in the input supply.

Large raisers usually have breeding farms as source of animals to be fattened while they are either importing or locally sourcing quality breeds. There are already local commercial farms that can provide quality breeds, comparable to the imported ones.

For feed supply, backyard farmers usually fed their animals with the locally-grown and/or available feed resources commercial. While those capable of buying concentrates sourced their feeds from the feed millers and/or feed retailers.

For veterinary and artificial insemination services, there are LGUs that provide these kinds of services to their farmers through their Provincial/City/Municipal Veterinary Offices (PVOs/CVOs/MVOs).

Small Ruminant Production

As mentioned in the discussions, small ruminant production in the Philippines is mostly backyard. There are few medium- to large-scale commercial farms that also contribute in the small ruminant inventory of the country.

Live Goat/Sheep Marketing

Live goat/sheep marketing can be done either of the following methods or channels:

Livestock 'oksyon' markets (LOMs), stockyards or concentration yards- Farmers or traders bring the small ruminants to the concentration yards for marketing. Transactions can either be farmer to trader; trader to trader; or trader to farmer. As of November 2015, around 86 are operational BAI-accredited LOMs in the country.

Traders- These are highly skilled in the estimation of liveweights of the animals. They are the ones that purchase small ruminants from scattered backyard farms and market them to viajeros. There are also instances that they already act as viajeros and sell the small ruminants directly to the retailers.

Primary Processing

Primary processing includes the slaughtering of the small ruminants and fabrication of its carcasses and these activities are done in or outside a slaughterhouse. At present there are very few slaughterhouses that slaughter small ruminants and none of them are solely used for small ruminant slaughtering and fabrication.

Chevon Marketing

Chevon is brought by the traders or integrators to various outlets before it can reach the final consumers. Chevon can be brought to few meat stalls in public markets where meat is usually hung in bulk and sliced only when the customers come, or in grocery stores where meat are properly fabricated and handled.

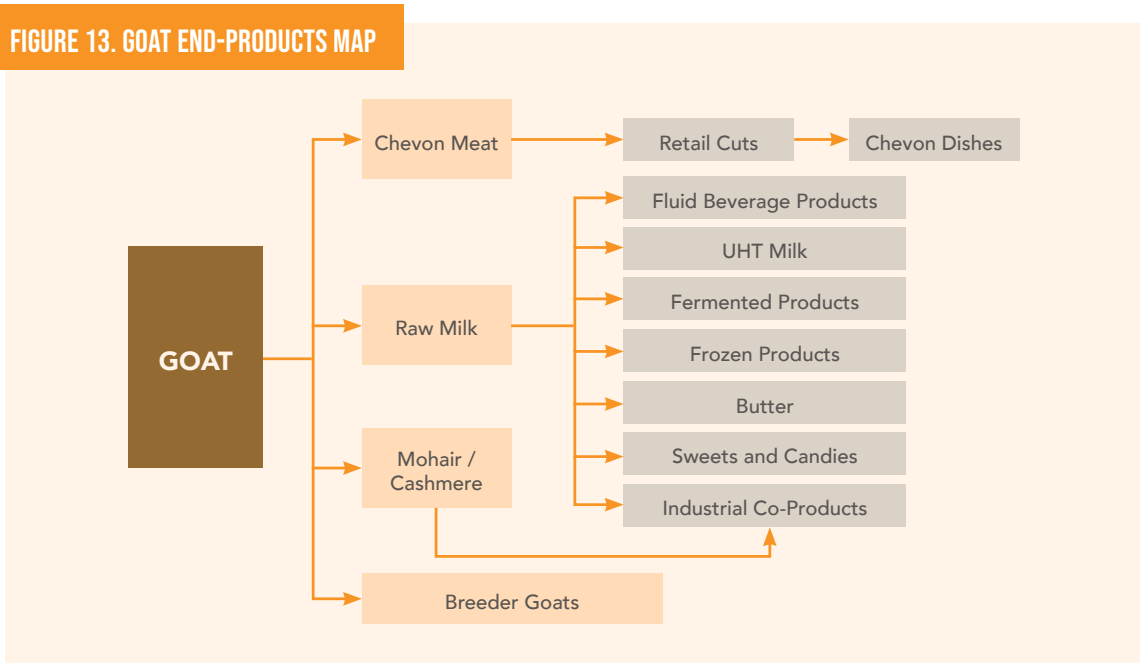
Product Forms

Goat

Goat is defined as a hardy domesticated small ruminant that has backward curving horns, cloven hooves and (in the male) a beard. This animal is usually raised for meat and milk. Goat has two types: the domesticated goats (Capra hircus) that are raised as farm animals; and mountain goats (Oreamnosamericanus) that thrive in steep, rocky areas in the American Northwest. The Philippine strain (also known as the common goat) and the Dadiangas goat (which originated from General Santos City) are among the goats raised by most Filipino farmers. Some farmers are also raising exotic breeds like Anglo-Nubian, Toggernburg, Saanen, French Alpine, and Boer.

Goat end-products are illustrated in Figure 13. Four (4) major products can be derived from goats namely chevon, milk, mohair/cashmere and the breeder animals. Raw milk is an input to a number of products like yoghurt, ice cream, butter, cheese, sweets (e.g. pastillas), soap, lotion, among others. Mohair/cashmere can be converted into sweaters, clothes, socks and scarves.

FIGURE 13. GOAT END-PRODUCTS MAP



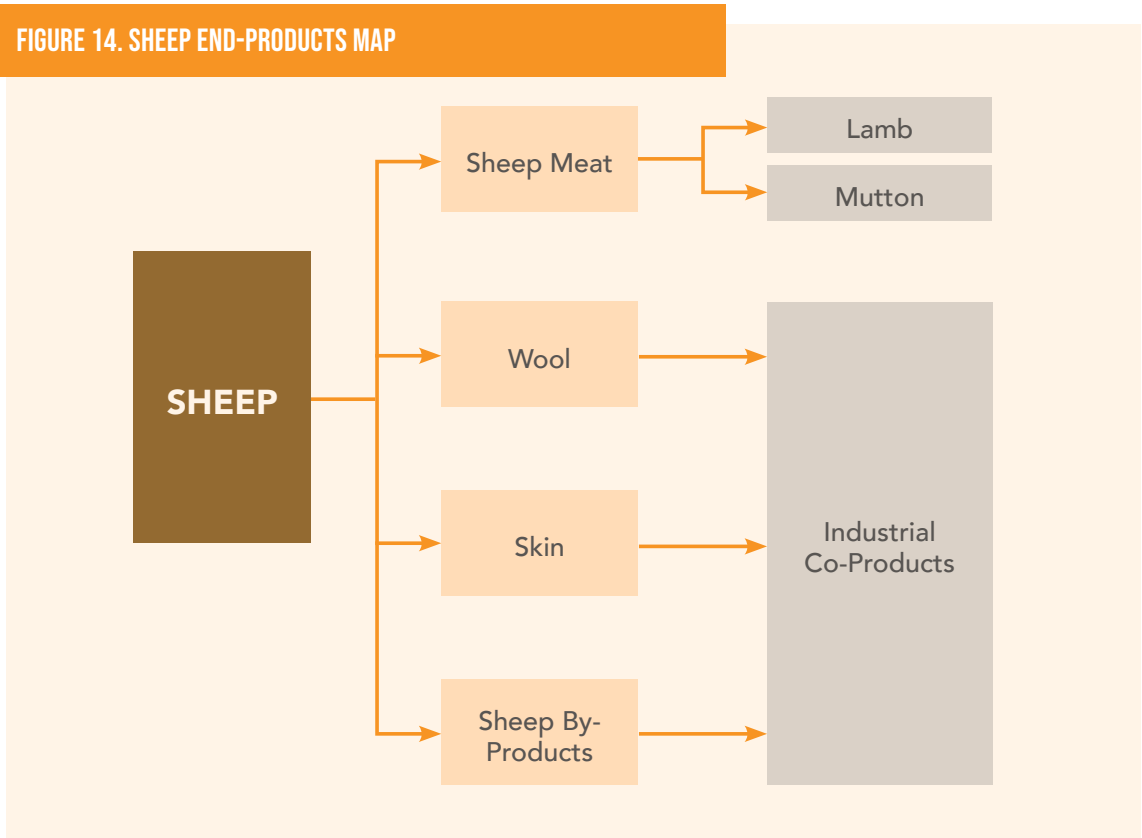
For the purpose of this roadmap, discussions will be focused on chevon and goat's milk only.

Sheep

Sheep with scientific name of Ovis aries is another small ruminant that is being raised for its meat, milk and wool. It is usually stockier than goat and unlike goat, male sheep has no beard. Generally, sheep is raised for meat, pet and seldom as source of livelihood to increase family income. Average matured weight of Philippine sheep is 29 kilograms where the liveweight of the male sheep was higher than the ewes by about 25% (Lambio et al., 1989). In both sexes, white is the primary color although there are sheep with significant amount of brown and brown and white combination.

Sheep end-products map is shown in Figure 14.

FIGURE 14. SHEEP END-PRODUCTS MAP

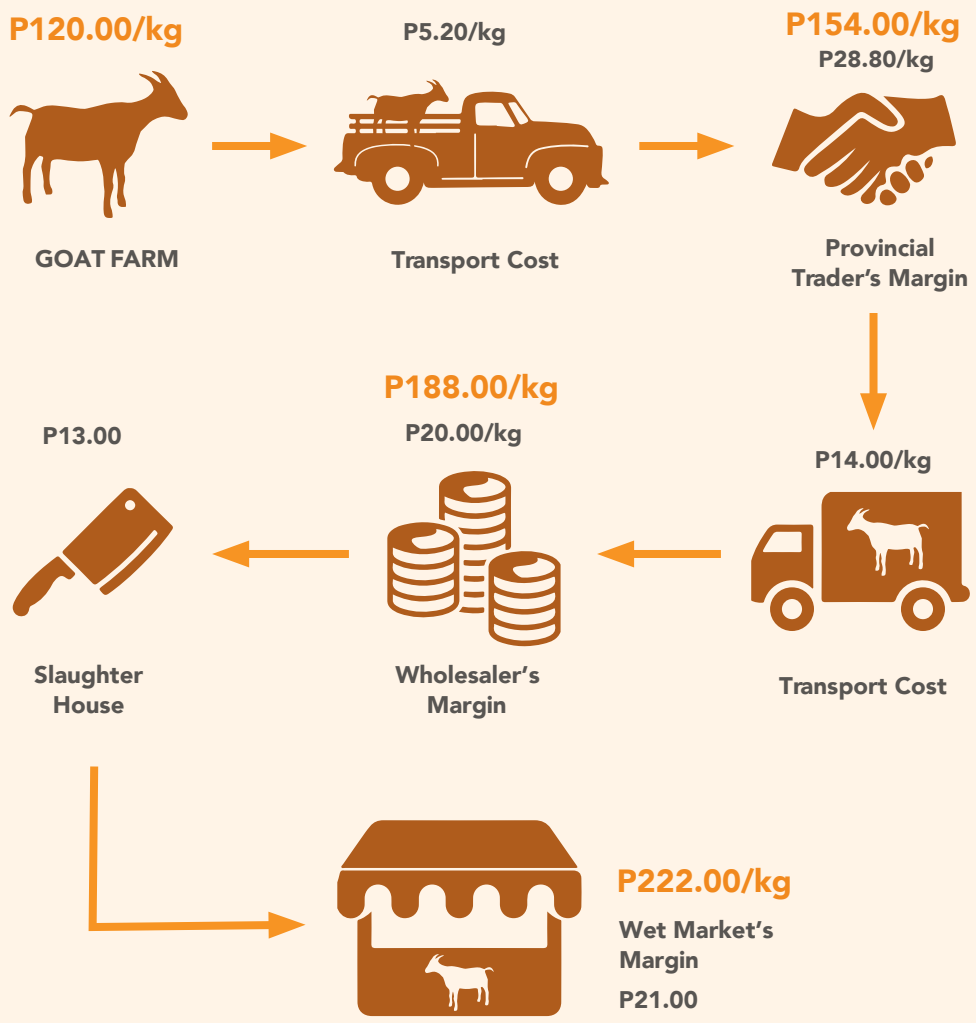


In this roadmap, most of the discussion on sheep products will be centered on sheep meat.

Goat

From the commodity end-products map, value chain structures of two main goat products (i.e. chevon and milk) are presented below. Figure 15 shows the value-chain of slaughter goat from Tarlac to Manila (2014). From the farmgate price of PhP120.00/kg, price of chevon reached PhP222.00/kg when sold in the wet market. There was a PhP102.00 price difference between the farmgate and the retail market. Highest margin was obtained by the provincial trader (i.e. 28.24% of the PhP102.00).

FIGURE 15. VALUE CHAIN OF SLAUGHTER GOAT FROM TARLAC TO METRO MANILA, 2014

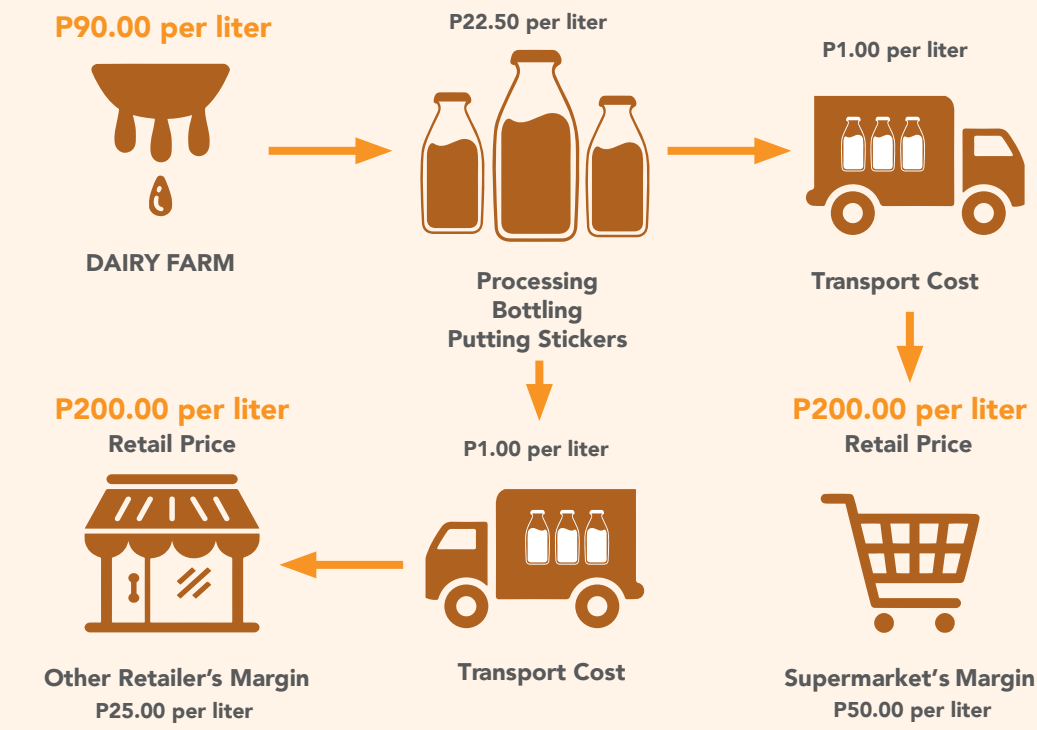


Source: Interview

Figure 16 illustrates logistic situation of the dairy milk goat in the Bicol Region. In terms of value chain analysis after the farm, raw milk is priced at P90 per liter. Processing costs from raw milk to pasteurized milk was around P14 per liter (this is broken down into P12 bottle cost and P2 overhead cost for gas, ice, and electricity). Add to the processing cost the P8.50 sticker price. After the goat's milk was processed, these were transported to various retailers for a P1 per liter transport cost.

The Bicol farm is wholesaling its goats' milk for P150 liter to P175 liter depending on the establishment. For example, SM and other famous establishments will get the goats' milk at P150 per liter while other lesser known establishments will get them P175 per liter. However, the milk sells for P200 per liter in the market. This is the retail price regardless of whether the Bicol farm itself or other establishments sell the milk. So, whether it is in wholesaling or retailing its own goat's milk, the goat farm and its retailing partners are earning quite handsomely.

FIGURE 16. VALUE CHAIN OF DAIRY MILK IN BICOL REGION, 2014

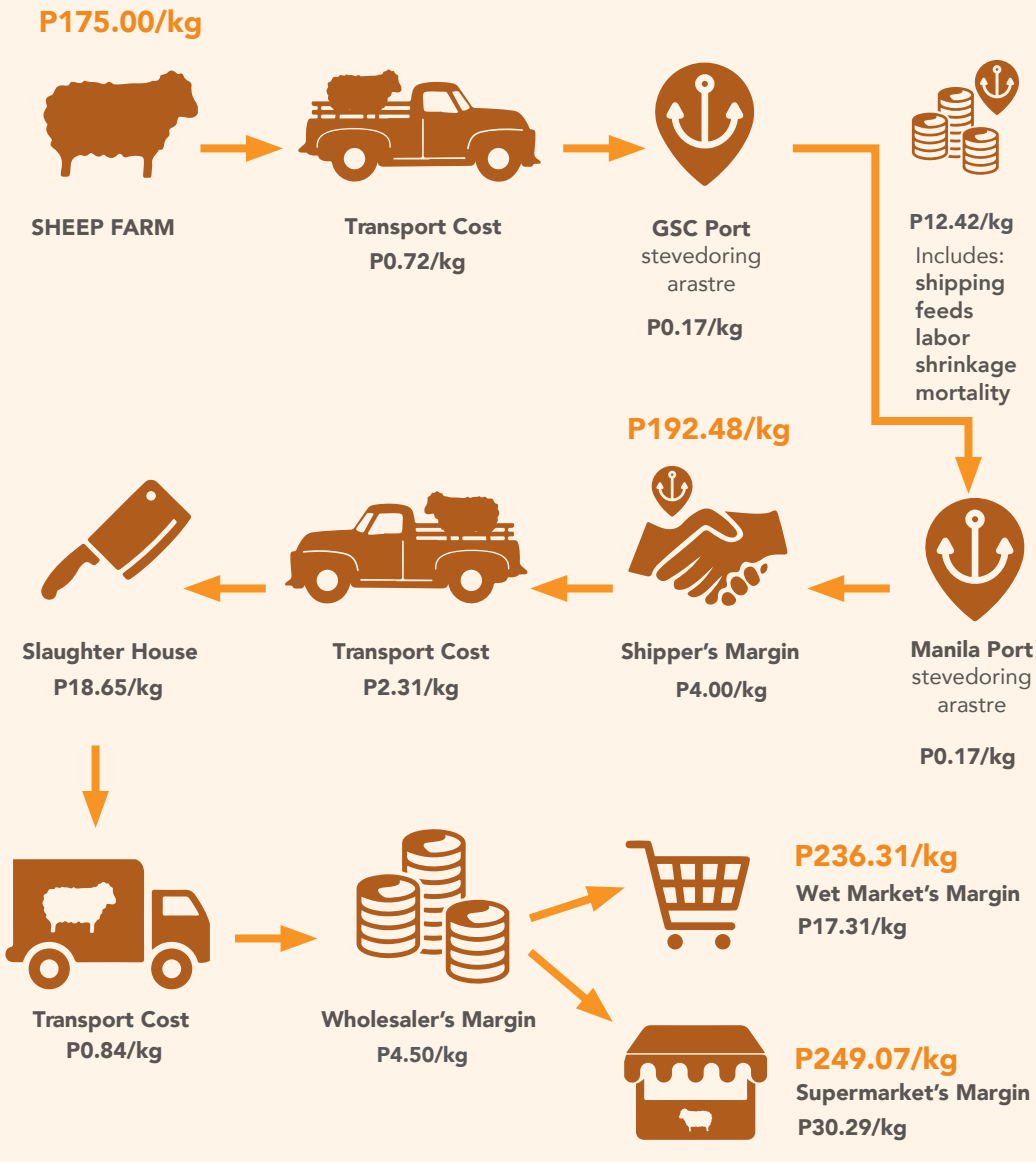


Source: Interview

Sheep

Value chain analysis of slaughter sheep from General Santos City is summarized in Figure 17. Farmgate price of sheep PhP175.00/kg went up to as high as PhP236.09/kg in the supermarket and PhP249.07 in the wet market. Based on the figure, wet market has bigger margin (i.e. PhP30.29/kg) compared to the supermarket (i.e. PhP17.31/kg).

FIGURE 17.VALUE CHAIN OF LIVE SHEEP IN GENERAL SANTOS CITY, 2014



Source: Interview

SWOT Analysis

To establish the strategies that need to be addressed in the Goat and Sheep Industry, the strengths, weaknesses, opportunities and threats were determined according to several categories namely: input supply, farm production, post-harvest and processing and marketing.

TABLE 3. SWOT ANALYSIS OF THE PHILIPPINE SMALL RUMINANT INDUSTRY (PER VALUE CHAIN SEGMENT)

Strengths	Weaknesses
Input Supply • Availability of good small ruminant genetics locally and abroad • Availability of areas and technologies for forage production and development • Availability of veterinary drugs and biologics • Freedom from FMD and PPR	**Input Supply** • Bureaucratic procurement system and weak implementation of regulatory standards for breeder goats • Weak implementation of the farm accreditation system for small ruminant • Absence of breed registry • Inadequate government policies to support the SR input supply industry • Difficulty in accessing credit
Farm Production • Existing/available technologies in SR production (i.e. feeding program) • Availability of training/teaching modules to capacitate the small hold farmers (FLS-GEM-Farm Production Technology) • Utilization of artificial insemination in goats	**Farm Production** • No established national farm recording systems for small ruminants • Limited budget for wider coverage of FLS –GEM training modality in Visayas and Mindanao; • Limited AI technician and promotion of artificial insemination in small ruminants. • Weak implementation of animal health programs at the LGU level • No national program for sheep • Limited information on national sheep inventory • Absence of national performance data (ADG, FCR etc.) for sheep as basis for establishing standard
Post-Harvest and Processing • Established licensing system for SR traders and carriers (vehicle) • Existing HALAL roadmap • Established goat-based aesthetic products • Established SR meat packaging	**Post-Harvest and Processing** • Weak implementation of Animal Welfare Act on small ruminant transport • Numerous municipal ordinances and cash points • Low private sector investments on small ruminant post-harvest • Lack of standards relative to live goat and sheep, meat (lamb and mutton) grading and processing standards

cont'd ▶

Strengths	Weaknesses
Marketing • Available technologies on chevon-based products (e.g. CLSU-developed products) • Presence of strategic LOMs all over the country • Popularity of chevon-based cuisine in local restaurants	**Marketing** • Lack of promotion on chevon and lamb • Unorganized smallholder marketing in some areas • Lack of quality standards for lamb, mutton, and goat's milk
Opportunities	**Threats**
Input Supply • Feed forage production as a profitable enterprise • Entrepreneurial opportunities (i.e. concentrate and pelletized feeds, supplements for different growth stages of goat)	**Input Supply** • Importation of breeding animals (has a negative impact to the industry stakeholders since there is competition rather than complementation) • Higher risk of entry of new diseases as a result of small ruminant importation • Seasonal availability of forage • Imported veterinary drugs and biologics (live vaccines) that might bring exotic small ruminant diseases
Farm Production • Development of local disease test kits from researches • Improved capability in biotechnology capability (i.e. cryopreservation, embryo transfer, among others)	**Farm Production** • Emerging small ruminant diseases • Climate change
Post-Harvest and Processing • Business opportunities on the provision of post-harvest facilities	**Post-Harvest and Processing**
Marketing • Domestic demand on choice cuts of chevon and mutton by hotels and restaurants • Growing halal market for small ruminant meat especially in Southeast Asia and the Middle East • Increasing demand for healthy food alternative • Business opportunities for goat's skin for leather and hair for cashmere • High potential market niche for chevon and lamb	**Marketing** • Lower priced imported chevon and mutton

Cost and Return Analysis

Goat

Technical and financial assumptions for goat production are shown in Appendix 1 and 2, respectively. For goat, three (3) types of goat enterprises were analyzed: 1) 100-doe level breeder goat farm; 2) 25- doe level meat-type goat farm, and; 3) 25- doe level dairy goat farm. The project statement, return of investment (ROI), internal rate of return (IRR) and net present value (NPV) at 16% discount rate of the respective goat enterprise are shown below.

Breeder Goat Farm (100-Doe Level)

TABLE 4. PROJECTED INCOME STATEMENT FOR A BREEDER GOAT FARM (100-DOE LEVEL) UNDER PURE CONFINEMENT SYSTEM, YEARS 1-5

Particulars	Project Year				
	Year 1	Year 2	Year 3	Year 4	Year 5
A. Sales Revenues					
Sale of Stocks	992,250	1,983,500	992,250	1,983,500	992,250
Inventory Value of Stocks					370,000
Total Sales Revenues	**992,250**	**1,983,500**	**992,250**	**1,983,500**	**1,362,250**
B. Direct Expenses					
Operating Expenses (OE)					
Labor	109,500	109,500	109,500	109,500	109,500
Cost of Concentrate	73,224	114,048	73,224	114,048	73,224
Veterinary Drug & Supply	10,700	16,400	10,700	16,400	10,700
Forage & Pasture Maintenance	0.00	4,000	4,000	4,000	4,000
Light & Water	6,000	6,000	6,000	6,000	6,000
Transportation	5,000	5,000	5,000	5,000	5,000
Repair & Maintenance	0.00	15,000	15,000	15,000	15,000
Land Rental	2,000	2,000	2,000	2,000	2,000
Interests on Loans	74,400	74,400	59,715	42,681	22,921
Total Operating Expenses	**280,824**	**346,348**	**285,139**	**314,629**	**248,345**

Particulars	Project Year				
	Year 1	Year 2	Year 3	Year 4	Year 5
C. Operating Income	**711,426**	**1,637,152**	**707,111**	**1,668,871**	**1,113,905**
Amortization (F&PD)	40,000	40,000	40,000	40,000	40,000
Amortization (Prepaid Expenses)	10,000	10,000	10,000	10,000	10,000
Depreciation	25,000	25,000	25,000	25,000	25,000
Total Indirect Expenses	**75,000**	**75,000**	**75,000**	**75,000**	**75,000**
D. Earnings Before Taxes (EBT)	**636,426**	**1,562,152**	**632,111**	**1,593,871**	**1,038,905**
Taxes (35% of EBT)	222,749	546,753	221,239	557,855	363,617
E. Net Income	**413,677**	**1,015,399**	**410,872**	**1,036,016**	**675,288**
ROI (%)	**44%**	**109%**	**44%**	**111%**	**73%**

Total project cost for a 100-doe level breeder goat farm is shown in Appendix 3.

TABLE 5. NET PRESENT VALUE AND INTERNAL RATE OF RETURN ANALYSIS FOR A BREEDER GOAT FARM (100-DOE LEVEL) PROJECT

	Initial Investment	Year 1	Year 2	Year 3	Year 4	Year 5
Cash flows	-930,000	548,677	998,620	379,408	987,517	977,029
IRR	**70%**					
NPV at 16% discount rate	**P1,393,086.90**					

Schedule of amortization and projected balance sheetfor a breeder goat farm (100-doe level) project from Year 1 to 5 are shown in Appendix Table 4 and 5, respectively.

Meat-Type Goat Farm (25-Doe Level)

TABLE 6. PROJECTED INCOME STATEMENT A MEAT-TYPE GOAT FARM (25-DOE LEVEL) UNDER SEMI-INTENSIVE SYSTEM, YEARS 1-5

Particulars	Project Year				
	Year 1	Year 2	Year 3	Year 4	Year 5
A. Sales Revenues					
Sale of Stocks	173,250	347,875	173,250	347,875	173,250
Inventory Value of Stocks					92,500
Total Sales Revenues	**173,250**	**347,875**	**173,250**	**347,875**	**265,750**
B. Direct Expenses					
Operating Expenses (OE)					
Labor	45,750	45,750	45,750	45,750	45,750
Cost of Concentrate	6,000	6,750	6,000	6,750	6,300
Veterinary Drug & Supply	2,500	5,000	2,500	5,000	2,500
Forage & Pasture Maintenance	0.00	4,000	4,000	4,000	4,000
Light & Water	2,000	2,000	2,000	2,000	2,000
Transportation	2,500	2,500	2,500	2,500	2,500
Repair & Maintenance	0.00	2,000	2,000	2,000	2,000
Land Rental	1,000	1,000	1,000	1,000	1,000
Interests on Loans	18,200	18,200	14,608	10,441	5,607
Total Operating Expenses	**77,950**	**87,200**	**80,358**	**79,441**	**71,657**
C. Operating Income	**95,300**	**260,675**	**92,892**	**268,434**	**194,093**
Amortization (F&PD)	5,000	5,000	5,000	5,000	5,000
Amortization (Prepaid Expenses)	6,000	6,000	6,000	6,000	6,000
Depreciation	6,500	6,500	6,500	6,500	6,500
Total Indirect Expenses	**17,500**	**17,500**	**17,500**	**17,500**	**17,500**
D. Earnings Before Taxes (EBT)	**77,800**	**243,175**	**75,392**	**250,934**	**176,593**
Taxes (35% of EBT)	27,230	85,111	26,387	87,827	61,807
E. Net Income	**50,570**	**158,064**	**49,005**	**163,107**	**114,785**
ROI (%)	**22%**	**69%**	**22%**	**72%**	**50%**

Total project cost for a 25-doe level meat-type goat farm is shown in Appendix 6.

TABLE 7. NET PRESENT VALUE AND INTERNAL RATE OF RETURN ANALYSIS FOR A MEAT-TYPE GOAT FARM (25-DOE LEVEL) PROJECT

	Initial Investment	Year 1	Year 2	Year 3	Year 4	Year 5
Cash flows	-227,500	88,070	153,113	40,462	150,396	189,741
IRR	**41%**					
NPV at 16% discount rate	**P139,252.24**					

Schedule of amortization and projected balance sheetfor a meat-type goat farm (25-doe level) project from Year 1 to 5 are shown in Appendix Table 7 and 8, respectively.

Dairy Goat Farm (25- Doe Level)

TABLE 8. PROJECTED INCOME STATEMENT A DAIRY GOAT FARM (25-DOE LEVEL) UNDER PURE CONFINEMENT SYSTEM, YEARS 1-5

Particulars	Project Year				
	Year 1	Year 2	Year 3	Year 4	Year 5
A. Sales Revenues					
Sale of Stocks	468,500	473,750	468,500	473,750	468,500
Inventory Value of Stocks					74,500
Total Sales Revenues	**468,500**	**473,750**	**468,500**	**473,750**	**543,000**
B. Direct Expenses					
Operating Expenses (OE)					
Labor	72,000	72,000	72,000	72,000	72,000
Cost of Concentrate	14,000	14,000	14,000	14,000	14,000
Veterinary Drug & Supply	3,000	3,000	3,000	3,000	3,000
Forage & Pasture Maintenance	0.00	10,000	10,000	10,000	10,000
Light & Water	1,000	1,000	1,000	1,000	1,000
Transportation	1,000	1,000	1,000	1,000	1,000
Repair & Maintenance	0.00	10,000	10,000	10,000	10,000
Land Rental	1,000	1,000	1,000	1,000	1,000
Milk containers (P12 x 20 bo. X 310)	74,400	74,400	74,400	74,400	74,400
Interests on Loans	27,200	27,200	21,831	15,604	8,380
Total Operating Expenses	**193,600**	**213,600**	**208,231**	**202,004**	**194,780**

cont'd ▶

Particulars	Project Year				
	Year 1	Year 2	Year 3	Year 4	Year 5
C. Operating Income	**274,900**	**260,150**	**260,269**	**271,746**	**348,220**
Amortization (F&PD)	8,000	8,000	8,000	8,000	8,000
Amortization (Prepaid Expenses)	4,000	4,000	4,000	4,000	4,000
Depreciation: (H&E)	10,000	10,000	10,000	10,000	10,000
Depreciation: (F&R)	4,000	4,000	4,000	4,000	4,000
Depreciation: (Fencing)	2,500	2,500	2,500	2,500	2,500
Total Indirect Expenses	**28,500**	**28,500**	**28,500**	**28,500**	**28,500**
D. Earnings Before Taxes (EBT)	**246,400**	**231,650**	**231,769**	**243,246**	**319,720**
Taxes (35% of EBT)	86,240	81,078	81,119	85,136	111,902
E. Net Income	**160,160**	**150,573**	**150,650**	**158,110**	**207,818**
ROI (%)	**31%**	**22%**	**17%**	**15%**	**16%**

Total project cost for a 25-doe level dairy goat farm is shown in Appendix 9.

TABLE 9. NET PRESENT VALUE AND INTERNAL RATE OF RETURN ANALYSIS A DAIRY GOAT FARM (25-DOE LEVEL) PROJECT

	Initial Investment	Year 1	Year 2	Year 3	Year 4	Year 5
Cash flows	-340,000	303,560	219,919	214,627	215,860	332,845
IRR	**72%**					
NPV at 16% discount rate	**P431,307.40**					

Schedule of amortization and projected balance sheetfor a dairy goat farm (25-doe level) project from Year 1 to 5 are shown in Appendix Table 10 and 11, respectively.

Sheep

Slaughter Sheep Farm (25-Ewe Level)

Only one (1) sheep enterprise (i.e. 25-ewe level slaughter sheep farm) was analyzed. The project statement, return of investment (ROI), internal rate of return (IRR) and net present value (NPV) at 16% discount rate of the aforementioned sheep enterprise are shown below.

TABLE 10. PROJECTED INCOME STATEMENT FOR A SLAUGHTER SHEEP FARM (25-EWE LEVEL) UNDER SEMI-EXTENSIVE SYSTEM, YEARS 1-5

Particulars	Project Year				
	Year 1	Year 2	Year 3	Year 4	Year 5
A. Sales Revenues					
Sale of Stocks	203,500	416,250	203,500	416,250	203,500
Inventory Value of Stocks					112,500
Total Sales Revenues	**203,500**	**416,250**	**203,500**	**416,250**	**316,000**
B. Direct Expenses					
Operating Expenses (OE)					
Labor	48,000	48,000	48,000	48,000	48,000
Salt blocks	120	120	120	120	120
Veterinary Drug & Supply	2,000	2,000	2,000	2,000	2,000
Forage & Pasture Maintenance	0.00	2,000	2,000	2,000	2,000
Light & Water	3,300	3,300	3,300	3,300	3,300
Transportation	3,600	3,600	3,600	3,600	3,600
Repair & Maintenance	0.00	7,000	7,000	7,000	7,000
Land rental	500	500	500	500	500
Interests on Loans	21,400	21,400	17,176	12,277	6,593
Total Operating Expenses	**78,920**	**87,920**	**83,696**	**78,797**	**73,113**
C. Operating Income	**124,580**	**328,330**	**119,804**	**337,453**	**242,887**
Amortization (F&PD)	5,000	5,000	5,000	5,000	5,000
Amortization (Prepaid Expenses)	6,000	6,000	6,000	6,000	6,000
Depreciation	8,750	8,750	8,750	8,750	8,750
Total Indirect Expenses	**19,750**	**19,750**	**19,750**	**19,750**	**19,750**

cont'd ▶

Particulars	Project Year				
	Year 1	Year 2	Year 3	Year 4	Year 5
D. Earnings Before Taxes (EBT)	**104,830**	**308,580**	**100,054**	**317,703**	**223,137**
Taxes (32% of EBT)	33,546	98,746	32,017	101,665	71,404
D. Net Income	**71,284**	**209,834**	**68,037**	**216,038**	**151,733**
ROI (%)	**25%**	**74%**	**24%**	**76%**	**53%**

Total project cost for a 25-ewe level meat-type sheep farm is shown in Appendix 12.

TABLE 11. NET PRESENT VALUE AND INTERNAL RATE OF RETURN ANALYSIS FOR A SLAUGHTER SHEEP FARM (25-EWE LEVEL) PROJECT

	Initial Investment	Year 1	Year 2	Year 3	Year 4	Year 5
Cash flows	-267,500	111,034	301,931	89,181	301,931	201,681
IRR	**62%**					
NPV at 16% discount rate	**P321,133.17**					

Schedule of amortization and projected balance sheetfor a slaughter sheep farm (25-ewe level) project from Year 1 to 5 are shown in Appendix Table 13 and 14, respectively.

Benchmark Analysis

Local

TABLE 12. COMPARISON OF BACKYARD AND COMMERCIAL FARMS IN TERMS OF PROJECTED INCOME STATEMENT

Parameters	Backyard	Year 2
Investment	Goat house Breeding stock	Fixed Investment Land, goat house, fences pasture area, water pump, feeding trough, spade, wheelbarrow, ropes Stocks Breeding does and breeding bucks
Operating Expenses	Veterinary medicines, vaccines, concentrates, additional feed supplements	Veterinary medicines, drugs and vaccines; feed supplements and goat rations; labor (fixed and seasonal); repair and maintenance of goat house, fences, equipment and pasture
Total Expense for 5 Years (PhP)	373,262.00	1,524,004
Total Income for 5 years [sale of stocks + stock inventory value (PhP)]	623,750.00	2,439,000
Net Income for 5 Years (PhP)	250,489.00	914,996
ROI (%)	67	60

1Under semi-confinement scheme 2Under pure-confinement scheme
Source: Business Diary PH, 2019

Global

For global benchmarking comparison includes the industry performance in terms of production and trade.

Goat

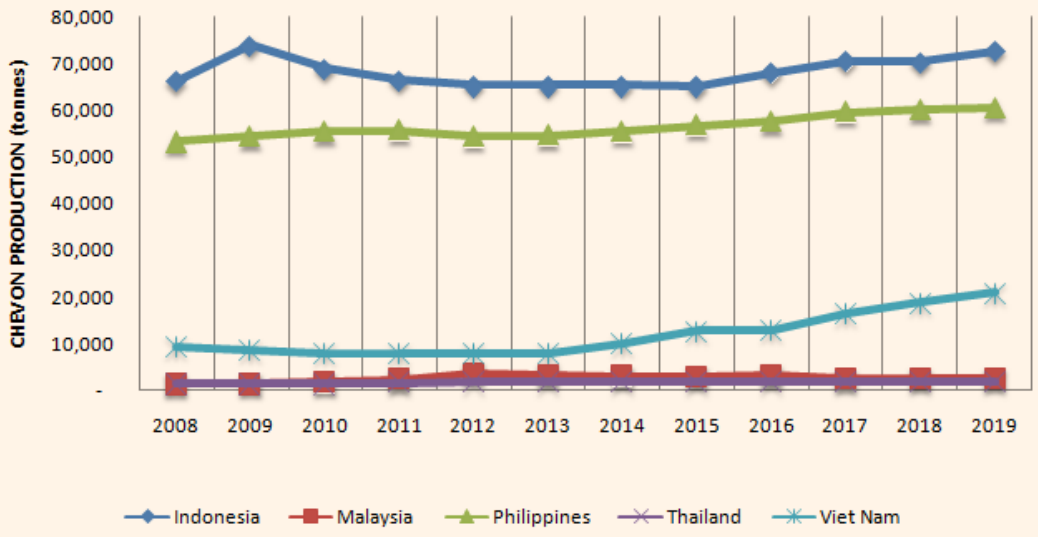
Volume of Production

Philippines. The average annual chevon production in the Philippines from 2008-2019 was 56,450 tonnes. For the past 10 years, growth of production was increasing except

for 2012 where there was an observed decline of -2.45% from the 2011 production level of 55, 619 tonnes. Annual production growth averaged 1.17%. Biggest growth recorded was 3.32% in 2017, with 59,510tonnes. In 2019, production totaled 60,526 tonnes, higher by 0.67% than 2018 level.

Comparative Analysis. Figure 18 shows the chevon production of the Philippines and the neighboring ASEAN countries namely Indonesia, Malaysia, Thailand and Vietnam. The Philippines ranked second to Indonesia in terms of chevon production. Average annual quantity produced by Indonesia was 11,581tonnes higher than the Philippines' production. Philippines output was almost five times higher than production level of Vietnam and 22 times higher than that of Malaysia. Thailand had the smallest chevon production among the five countries compared.

FIGURE 18. CHEVON PRODUCTION BY COUNTRY, 2008-2019



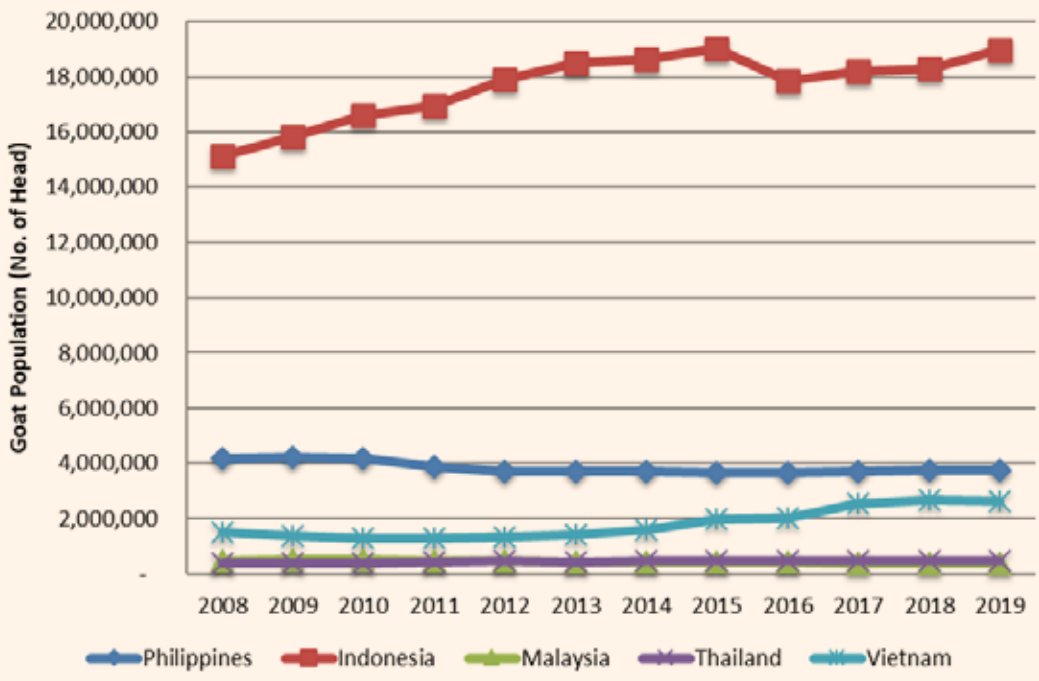
Source: FAOSTAT

Inventory

Philippines. The average annual goat inventory in the Philippines from 2008 to 2019 was 3.84M heads. For the past 10 years, growth of goat population was erratic. Annual population growth averaged -0.92%. Biggest growth recorded was 1.29% in 2017, with 3.71M heads. According to FAOSTAT data, goat inventory in 2019 totaled 3.75M heads, higher by 0.83% than 2018 level.

Comparative Analysis. Figure 19 shows the goat population of the Philippines and the neighboring ASEAN countries namely Indonesia, Malaysia, Thailand and Vietnam. The Philippines ranked second to Indonesia in terms of goat inventory. Average annual goat population in Indonesia was higher by 13.81 M heads compared to the Philippines' average. Philippines goat population was nine times higher than that of Malaysia and Thailand. Thailand had the smallest number of goat stocks among the five countries compared.

FIGURE 19. GOAT POPULATION BY COUNTRY, 2008-2019



Source: FAOSTAT

Trade

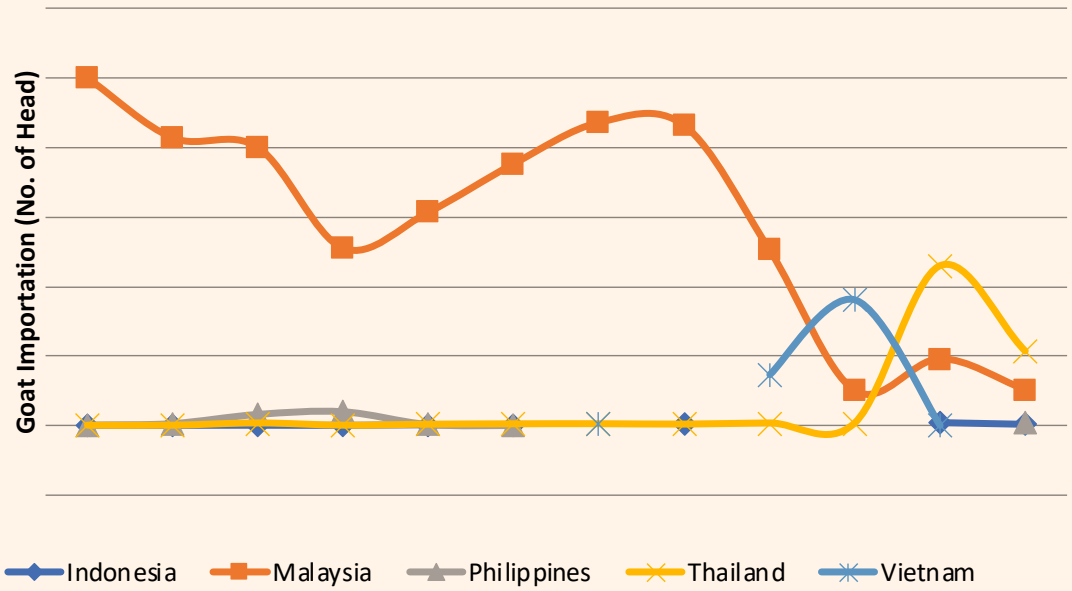
Importation

Live Goats

Philippines. Goat imports of the Philippines had an erratic trend for the past 10 years. Highest importation was 4,100 heads in 2011, 24.47% higher than the previous year's level. Value of importation had an annual average of around US$158,571. In 2019, the Philippines only had 692 heads imported goats with a value of US$200,000. There were no recorded importations from 2014 to 2018. The Philippines' imported pure-bred breeding goats from the United States and Australia

Comparative Analysis. Among the five (5) countries, the Philippines is the least in terms of goat importation, importing and average of 252 heads annually. While Malaysia had the highest number of goats imported during the reference years averaging 59, 505 heads per year.

FIGURE 20. GOAT IMPORTATION BY COUNTRY, 2008-2019



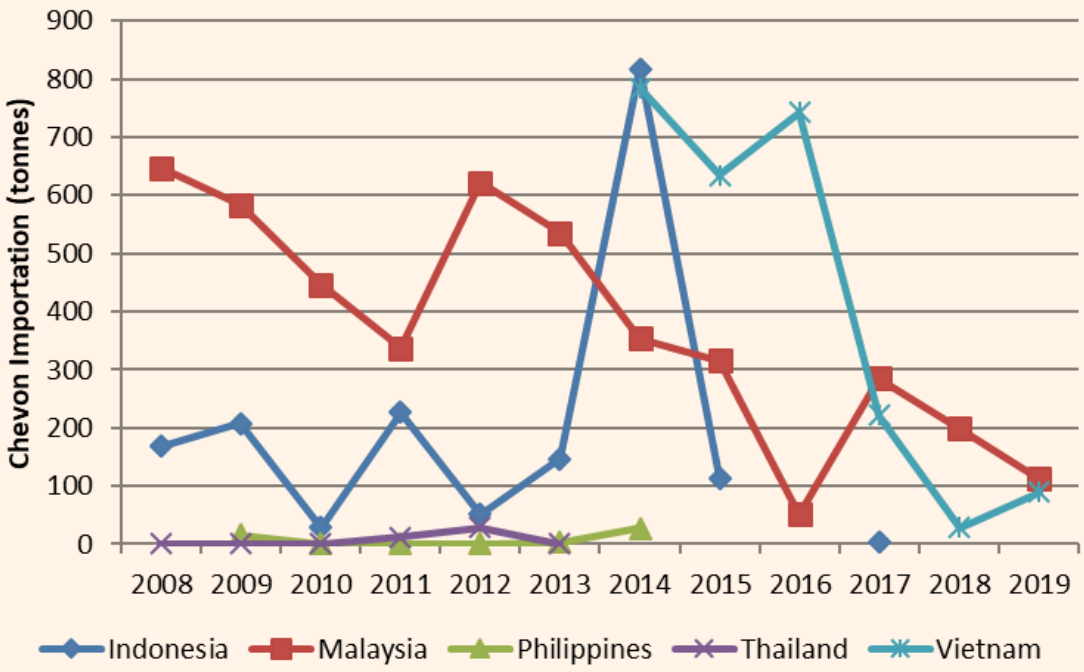
Source: FAOSTAT

Chevon

Philippines. Chevon importations of the Philippines were small, with an annual average of 8 tonnes. Based on the FAOSTAT data, the Philippines only imported chevon in the years 2009, 2012 to 2014 which were 16, 1, 3 and 27 tonnes, respectively. Goat's meats were imported from the USA, Australia and China.

Comparative Analysis. In terms of chevon importation, the Philippines ranked fourth among the five (5) countries considered. Although Filipinos are known to be pork and chicken eaters, presence of imports indicates that there is a demand for chevon in the country. It was Vietnam that led in the chevon importation, followed by the Malaysia and Indonesia.

FIGURE 21. CHEVON IMPORTATION BY COUNTRY, 2008-2019



Source: FAOSTAT

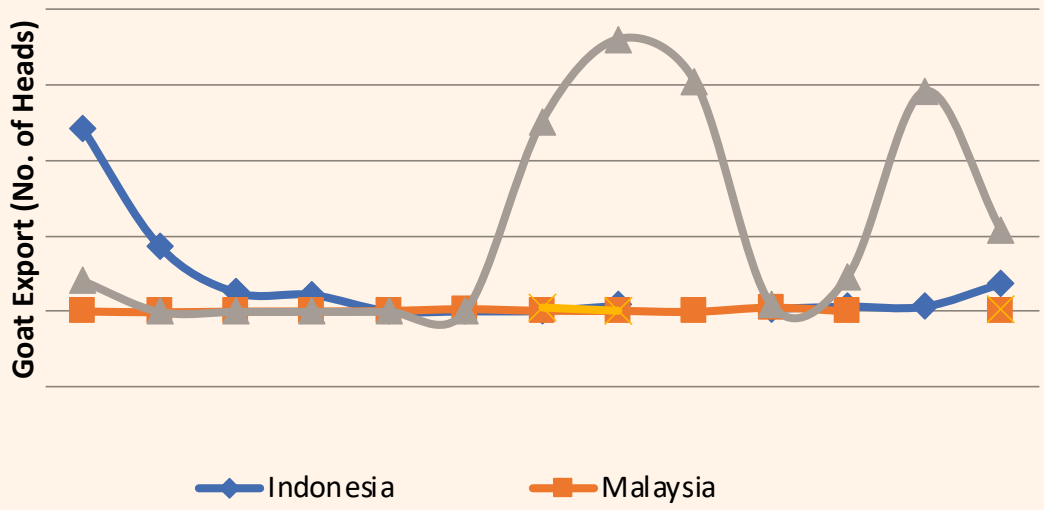
Exportation

Live Goats

Philippines. FAOSTAT has no available data on live goat volume and value of exports of the Philippines.

Comparative Analysis. Philippines is not yet a player in terms of live goat export. Thailand was the top live goat exporter among the four (4) ASEAN countries. Indonesia, Vietnam and Malaysia followed Thailand.

FIGURE 22. GOAT EXPORTS BY COUNTRY, 2008-2019



Chevon

Philippines. FAOSTAT has no available data on chevon volume and value of exports of the Philippines.

Comparative Analysis. All the five (5) ASEAN countries were not yet active exporters of chevon.

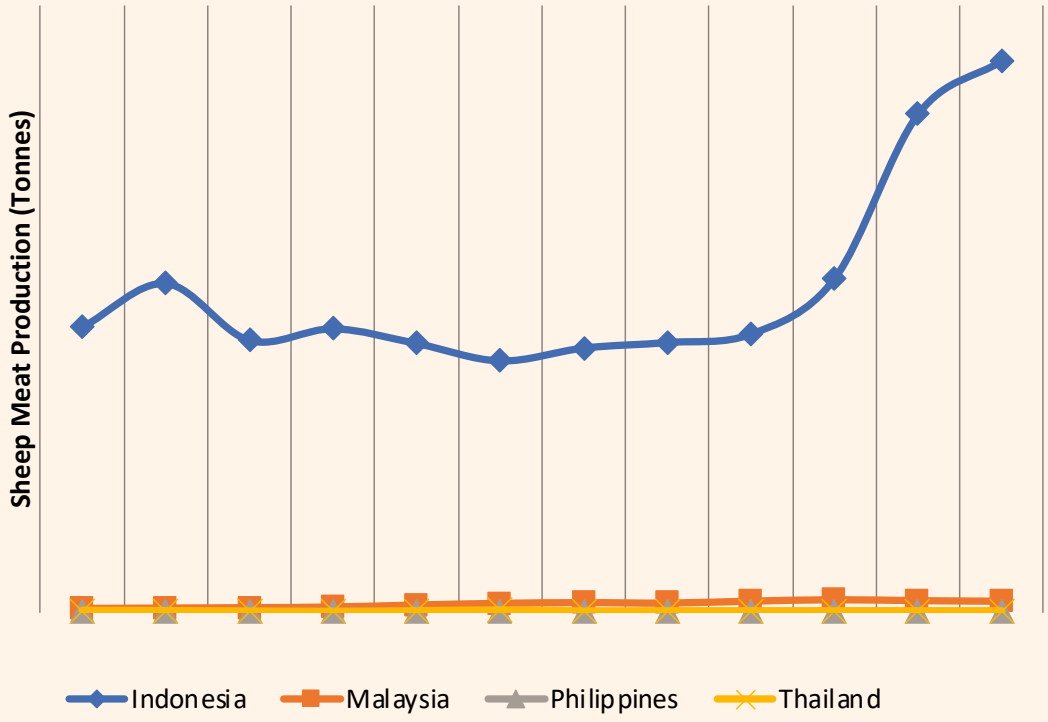
Sheep

Volume of Production

Philippines. The sheep meat production in the Philippines remained at 117 tonnes from 2008-2019.

Comparative Analysis. Figure 23 shows the sheep meat production of the Philippines and the neighboring ASEAN countries. The Philippines had the lowestsheep meat production while Indonesia had the biggest production. It can be observed that there was a big difference on Indonesia's output compared to the other 3 countries.

FIGURE 23. SHEEP MEAT PRODUCTION BY COUNTRY, 2008-2019



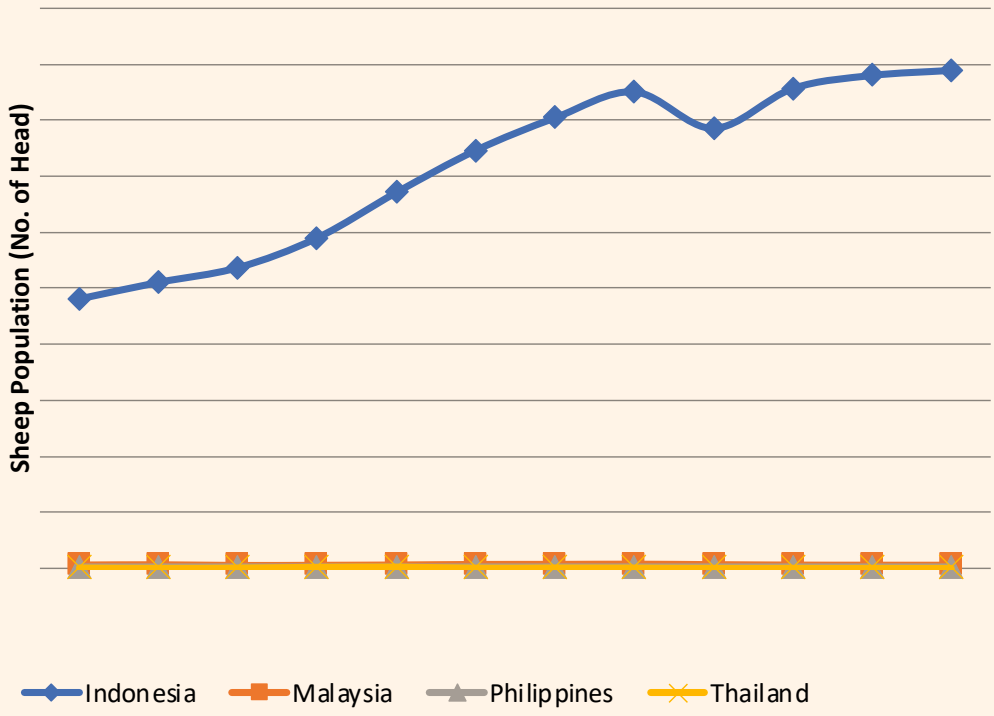
Source: FAOSTAT

Inventory

Philippines. For the past 10 years, sheep population in the Philippines was nailed to 30,000 heads.

Comparative Analysis. Figure 24 shows the sheep population of the Philippines and the neighboring ASEAN countries namely Indonesia, Malaysia, Thailand and Vietnam. The Philippines ranked lowest in terms of sheep inventory. Indonesia had the largest population of sheep among the four (4) compared.

FIGURE 24. SHEEP POPULATION BY COUNTRY, 2008-2019



Source: FAOSTAT

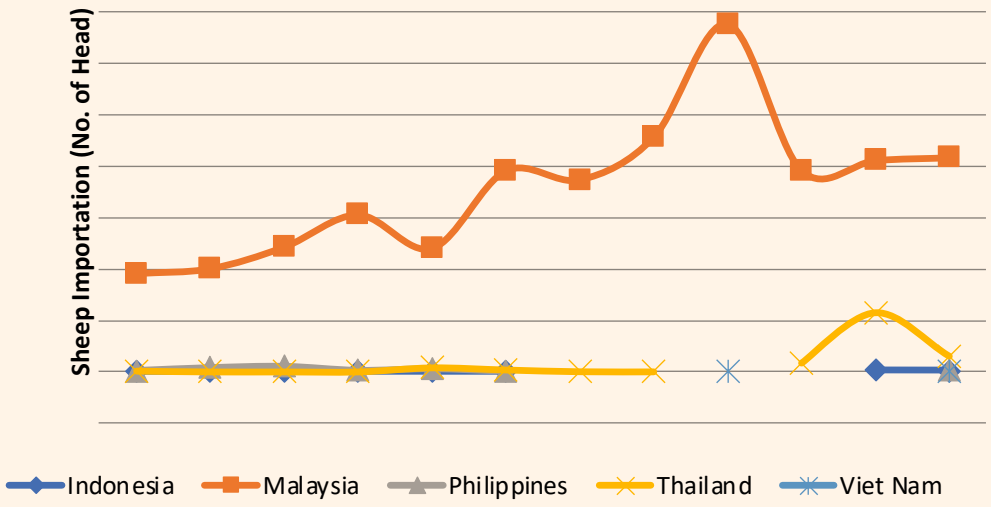
Importation

Live Sheep

Philippines. Sheep imports of the Philippines had an erratic trend for the past 10 years. Highest importation was 1,191 heads in 2010, 33.67% higher than the previous year's level. Value of importation had an annual average of around US$158,571. In 2019, the Philippines only had 433 heads imported sheep with a value of US$91,000. There were no recorded importations from 2014 to 2018.

Comparative Analysis. Among the five (5) countries, the Philippines ranked third in terms of sheep importation, importing an average of 528 heads annually. While Malaysia had the highest number of sheep imported during the reference years averaging 59, 505 heads per year.

FIGURE 25. SHEEP IMPORTATION BY COUNTRY, 2008-2019



Source: FAOSTAT

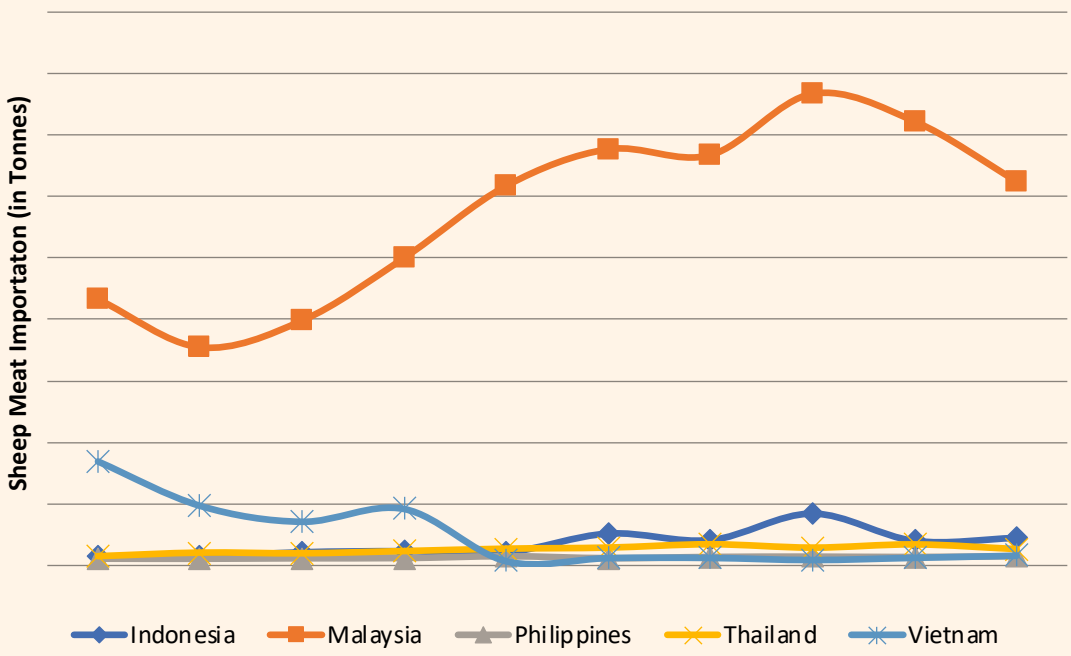
Sheep Meat

Philippines. Sheep meat imports of the Philippines usually increased for the past 10 years except for 2011, 2015 and 2018. Highest importation was 780 tonnes in 2019,

12.55% higher than the previous year's level. Value of importation had an annual average of around US$4,10M. In 2019, the Philippines had 780 tonnes imported sheep meat with a value of US$578, 000.

Comparative Analysis. Among the five (5) countries, the Philippines is the least in terms of sheep meat importation, importing and average of 643 tonnes annually. While Malaysia had the highest number of sheep meat imported during the reference years averaging 28, 811 tonnes per year.

FIGURE 26. SHEEP MEAT IMPORTATION BY COUNTRY, 2008-2019



Source: FAOSTAT

Exportation

Sheep Meat

Among the five (5) ASEAN countries, only Malaysia consistently exported sheep meat averaging 57.4 tonnes per year. Philippines, Indonesia, Thailand and Vietnam were not yet active exporters of sheep meat.

Competitive Analysis

Local

Quality Standards and Comparisons

Goat

There is no existing Philippine National Standards (PNS) for the live and meat grading of goat thus, its marketing is solely based on weight. Quality goat and chevon receives no premium in the existing market. Yet, there are already existing PNS to ensure the quality of the produced goat and its products.

TABLE 13. STANDARDS FOR GOATS IN THE PHILIPPINES

Philippine National Standard (PNS) Number	Title
164: 2015	Code of Slaughtering Practices for Goats
165:2015	Chevon cuts
201: 2017	Code of Good Animal Husbandry Practice for Goats

Sheep

Just like in goats, there is no Philippine National Standards (PNS) for the live and meat grading of sheep that would command premium pay for quality animals and meat. However, the Code of Good Animal Husbandry Practice for Sheep (PNS/BAFS 202:2017) will ensure the quality of the produced sheep and its products.

International/Global

Price Competitiveness

Goat

Chevon

In terms of competitiveness analyses for goat meat, local chevon is competitive vis-à-vis imported ones as indicated by import parities of 1.22 and 1.28 for two (2) price regimes of US$5,200 and US$5,500 per MT, respectively.

TABLE 14. COMPETITIVENESS ANALYSES FOR GOAT MEAT

At Different Price Quotation (FOB) and Same Exchange Rates	Carcass, half-carcasses, and frozen Price/Kilo at 30% in-quota tariff		Carcass, half-carcasses, and frozen Price/Kilo at 30% in-quota tariff	
	(Per MT)	(Per Kg)	(Per MT)	(Per Kg)
FOB Price (US$ per MT)*	5,200	5	5,500	6
Freight and Insurance (US$)	650	1	650	1
CIF Manila ($)	**5,850**	**6**	**6,150**	**6**
Times Foreign Exchange rate	46		46	
CIF Manila (PhP)	**269,100**	**269**	**282,900**	**283**
Plus Tariff Rate %	0		0	
Tariff Cost (PhP)	80,730	81	84,870	85
Plus Handling Distribution Cost (HDC)	1100	1	1100	1
Total Landed Cost (PhP)	**350,930**	**351**	**368,870**	**369**
Plus Trading Cost/Margins (TC/M) at 5%	17547	18	18444	18
Domestic Wholesale Import Parity Price (PhP)	**368,477**	**368**	**387,314**	**387**
Domestic Wholesale Price (PhP)^	**302,000**	**302**	**302,000**	**302**
Import Parity/Domestic Wholesale Price		**1.22**		**1.28**

* FOB price quotation from BAI-NVQSD, as of June, 2015

^ as of June 2015

Note: Competitiveness exists if import parity/domestic wholesale price is greater than 1.

Goat's Milk

The Philippines does not import goat's milk but mainly cow's milk. But since goat's milk can be a substitute for cow's milk, analyses were deemed necessary although it is not an apple-to-apple comparison. In terms of competitiveness analyses for milk, local milk is barely competitive vis-à-vis imported ones because of import parities of 0.91 and 1.07 for the two (2) price regimes of US$2,500 and US$3,000 per MT.

TABLE 15. COMPETITIVENESS ANALYSES FOR MILK

At Different Price Quotation (FOB) and Same Exchange Rates	Full cream Milk Price/Kilo at 30% in-quota tariff		Full cream Milk Price/Kilo at 35% in-quota tariff	
	(Per MT)	(Per Kg)	(Per MT)	(Per Kg)
FOB Price (US$ per MT)*	2,500	3	3,000	3
Freight and Insurance (US$)	385	0	385	0
CIF Manila ($)	**2,885**	**3**	**3,385**	**3**
Times Foreign Exchange rate	46		46	
CIF Manila (PhP)	**132,710**	**133**	**155,710**	**156**
Plus Tariff Rate %	0		0	
Tariff Cost (PhP)	39,813	40	46,713	47
Plus Handling Distribution Cost (HDC)	640	1	640	1
Total Landed Cost (PhP)	**173,163**	**173**	**203,063**	**203**
Plus Trading Cost/Margins (TC/M) at 5%	8,658	9	10,153	10
Domestic Wholesale Import Parity Price (PhP)	**181,821**	**182**	**213,216**	**213**
Domestic Wholesale Price (PhP)^	**200,000**	**200**	**200,000**	**200**
Import Parity/Domestic Wholesale Price		**0.91**		**1.07**

* FOB price quotation, as of December, 2014
^ as of May 2007
Note: Competitiveness exists if import parity/domestic wholesale price is greater than 1.

Sheep

Lamb

In terms of competitiveness analyses for lamb, local lamb is competitive vis-à-vis imported ones because of import parities of 1.29 and 1.43 for the two (2) price regimes of US$5,800 and US$6,500 per MT.

TABLE 16. COMPETITIVENESS ANALYSES FOR LAMB

At Different Price Quotation (FOB) and Same Exchange Rates	Lamb shoulder Price/Kilo at 30% in-quota tariff		Lamb shoulder Price/Kilo at 30% in-quota tariff	
	(Per MT)	(Per Kg)	(Per MT)	(Per Kg)
FOB Price (US$ per MT)*	5,800	6	6,500	7
Freight and Insurance (US$)	745	1	745	1
CIF Manila ($)	**6,545**	**7**	**7,245**	**7**
Times Foreign Exchange rate	46		46	
CIF Manila (PhP)	**301,070**	**301**	**333,270**	**333**
Plus Tariff Rate %	0		0	
Tariff Cost (PhP)	90,321	90	99,981	100
Plus Handling Distribution Cost (HDC)	1,240	1	1,240	1
Total Landed Cost (PhP)	**392,631**	**393**	**434,491**	**434**
Plus Trading Cost/Margins (TC/M) at 5%	19,632	20	21,725	22
Domestic Wholesale Import Parity Price (PhP)	**412,263**	**412**	**456,216**	**456**
Domestic Wholesale Price (PhP)^	**320,000**	**320**	**320,000**	**320**
Import Parity/Domestic Wholesale Price		**1.29**		**1.43**

* FOB price quotation from BAI-NVQSD, as of June, 2015
^ as of June, 2015
Note: Competitiveness exists if import parity/domestic wholesale price is greater than 1.

TABLE 17. STRENGTHS OF THE COMPETITOR'S SMALL RUMINANT INDUSTRY

	Indonesia[1]	Thailand[2]	Vietnam[3]
Input Supply	Abundance of forage in the middle zones and uplands Good quality of Etawah-grade goats as breeding stock Climatic condition and natural environment are suitable for goat farming High prolificacy of small ruminants High quality of manure	Areas of palm oil and rubber plantation is expanding where goat farms can be incorporated Implementation of School Milk Programme	Available local indigenous and imported dairy goat breeds Presence of Goat and Rabbit Research Center (GRRC) that coordinates breeding and research programs Agro by-products that can be used as goat feed are available

Sources:
1Stanton, Emms and Sia (2010); Budisatria et al. (2007)
2Anothaisinthawee, S., S. Nakavisut1 , S. Yuyuen1 & T. Thongchumroon (2012)
3Nguyen, M.D. & N.A. Nguyen (2012)

TABLE 18. WEAKNESSES OF THE COMPETITOR'S SMALL RUMINANT INDUSTRY

	Indonesia[1]	Malaysia[2]	Thailand[3]	Vietnam
Input Supply	Lack of financial capital Many goat farms have limited space for farm expansion Unavailability of suitable breeding goats Lack of feed resources Most farmers lack the technical knowledge and training to improve their livestock's productivity Lack of good production practices program for farmers Susceptibility of small ruminants to diseases, e.g. scabies, bloat and poisoning Traditional management Lack of household labor Per capita annual consumption of chevon is relatively low Low milk consumption Information on the population, milk production and on dairy goat business centers is scarce Lack of market priority (export) Limited post-harvest technology and facilities	Land farm/zoning Dependency on imported breeding stock Limited ability of the farmers to utilize comparative advantages concept Demand for goat's milk is very small due to "goaty" odour	Aversion of most people against the strong smell in goat milk Lacks suitable land for small ruminant farming Lacks feed resources in some parts of the country Most farmers have inadequate knowledge of goat husbandry Weak market	Aversion of most people against the strong smell in goat milk Lacks suitable land for small ruminant farming Lacks feed resources in some parts of the country Most farmers have inadequate knowledge of goat husbandry Weak market

Sources:
1Stanton, Emms and Sia (2010); Budisatria et al. (2007); Astuti, D.A. & A. Sudarman (2012)
2Loh, T.C. (); Jamaluddin, A.A., K. Idris & R. Roslaini (2012)
3Anothaisinthawee, S., S. Nakavisu, S. Yuyuen1 & T. Thongchumroon (2012)
4Nguyen, M.D. & N.A. Nguyen (2012)

MARKET TRENDS AND PROSPECTS

Key Demand Drivers

Human population is continuously increasing so as the demand for livestock meat, milk, among other products. According to Worldometers (2021), the current population of the Philippines is 111,241,145. Since 2015, there was a mean annual population increase of 1.47%. Population size is projected to increase to 142M in 2040 (Racelis et al, 2012). Per capita consumption of chevon was 1.53 grams/day or 0.55 kg/year in 2014. Assuming that the demand would be constant, the Philippines needs 61.18 M kilogram of chevon this year and an estimated 78.10M in 2040. The demand for goat meat may also rise since other meat sources are having problems on diseases causing a decrease in supply and increase in market prices.

Meanwhile, annual per capita milk consumption in the country is approximately 22 kg. This means we need to produce a total of 2.45B kg this year and 3.12B kg in 2040. As of now, we are still import-dependent in terms of milk. The supply of chevon, sheep meat and goat's milk at present are too low compared to their estimated demands.

Another demand driver is the urbanization. According to Worldometers (2021), 47.5% of the population in the Philippines is urban. Urbanization connotes fast-paced lifestyle and the demand for easy-to-cook and ready-to-eat food. There will be future for goat meat canning technology like the Chevon Valley developed by the Isabela State University (ISU). Income growth is another reason why demand for small ruminant's products like chevon, sheep meat and goat's milk can increase. As income increases, so as the spending for livestock products (Steinfeld et al. 2006). Chevon dishes like kaldereta, papaitan, among others are popular as 'pulutan'. When there is improvement in income, there would be more available money for drinking spree and a possible growth in chevon consumption.

Market Prospects

Local and International Market Prospects of Goat and Sheep

Goat production has a high rate of return even with a low investment. The low supply of goat's meat or chevon amidst its high demand is an evidence of its potential especially for health-conscious consumers (DOST-PCAARRD, 2016). Chevon is lower in saturated fat than pork, chicken, and beef (Alo, 2017). It is also low in cholesterol and calories but high in protein, potassium, and iron content (Yap, 2020).

Central Luzon State University (CLSU) introduced the goat meat on-the-go chevon-based products through a research initiative funded by the Department of Agriculture- Bureau of Agricultural Research (DA- BAR) through its National Technology Commercialization Program entitled "Enhancement if Innovative Chevon-Based Products Towards Commercialization" products include: instant kapukan, chevon papaitan, chevon jerky or bak-wa, binalot na kalderetang kambing and chevon tapa (Gestupa, 2019). Additionally, in 2015, chevon-based food products such as: different variants of chevon mixes, ready to eat chevon in pouches, bulgogi, kambing satay, and bouillon have been developed and applied for patent. There are also canned products namely: canned adobo kambing, kambing kilawin and kalderetang kambing that have been commercialized with Agric Component Corporation, a commercial establishment that processes and cans chevon in Isabela (Alo, 2017). These products have a potential in the market as well as for export.

There is an increasing demand for halal food, and this is due to the increase in Muslim population that is projected to be about 26.4% (8.3B) of the world's population by 2030 (Yap, 2020). Another reason for the demand of halal products is the interest of consumers for a safe, clean, and wholesome food. Goat is a popular choice as the Qurbani or "sacrifice" during Islamic religious events such as Eid'lFitr and Eid'lAdha this is because it is an affordable option compared to cattle, buffalo, or sheep (Yap, 2020).

PRIORITY CONCERNS & OPPORTUNITIES/ CONSTRAINTS AND OPPORTUNITIES

Below are the priority concerns/ constraints of the small ruminant industry that will be addressed by this roadmap.

Input Supply

- Bureaucratic procurement system and weak implementation of regulatory standards for breeder goats
- Weak implementation of the farm accreditation system for small ruminant
- Absence of breed registry and recording system
- Inadequate government policies to support the SR input supply industry
- Difficulty in accessing credit

Farm Production

- Limited budget for wider coverage of FLS –GEM training modality in Visayas and Mindanao;
- Limited AI technician and promotion of artificial insemination in small ruminants.
- Weak implementation of animal health programs at the LGU level
- No national program for sheep
- Limited information on national sheep inventory
- Absence of national performance data (ADG, FCR etc.) for sheep as basis for establishing standard

Post-Harvest and Processing

- Numerous municipal ordinances and cash points
- Low private sector investments on small ruminant post-harvest facilities
- Lack of standards relative to live goat and sheep live, meat grading and processing standards

Marketing

- Lack of promotion on chevon and lamb
- Unorganized smallholder marketing in some areas
- Lack of quality standards for lamb, mutton, and goat's milk

THE SMALL RUMINANT INDUSTRY ROADMAP

WAY FORWARD

TARGET SETTING
(WHERE DO WE WANT TO GO?)

Industry Vision

"A competitive and sustainable Philippine goat and sheep industry by 2040."

Industry Mission

"Capacitating the goat and sheep industry stakeholders using a science and technology-based modality, and adopting economically-viable and environmentally- sound value chain practices, in order to provide healthy food for the Filipinos and the global community."

Industry Goals, Objectives and Targets

TABLE 19. GOAL, OBJECTIVES AND TARGETS OF THE PHILIPPINE SMALL RUMINANT INDUSTRY FOR SHORT-, MEDIUM- AND LONG-TERM

Goal 1: To improve the quantity of goat and sheep by 2040			
	Short-Term (2021-2025)	**Medium (2026-2030)**	**Large (2031-2040)**
Objectives	Increase the population of quality goat and sheep by 710% from the baseline of 3of 3.81M (2020) and 0.049M (2010)	Increase the population of quality goat and sheep by 307% from% from the baseline of 3of 3.81M (2020) and 0.049M (2010)	Increase the population of quality goat and sheep by 203175% from the baseline of 3of 3.81M (2020) and 0.049M (2010)
Targets: Goat	4,086,752	4,971,584	10,478,081
Sheep	53,319	64,863	136,704
Objectives	Improve production efficiency		
Targets for Meat-Type Goat			
Milking period, days	90	180	240
Milk production, L/day	0.5	2.0	4.0
Pre-weaning mortality, %	25	10	5
Goal 2: To promote enterprise development along the value chain			
	Short-Term (2021-2025)	**Medium (2026-2030)**	**Large (2031-2040)**
Objectives	Increase goat farmers by 13% from the baseline 659,772 (2014) and develop them into agripreneurs	Increase goat farmers by 27% from the baseline 659,772 (2014) and develop them into agripreneurs	Increase goat farmers by __% from the baseline 659,772 (2014)
Targets	745,542	837,910	

*Assumptions: Good genetics and best management practices (i.e. feeds and feeding management, health management and regular husbandry practices) are made available to smallhold farmers

RECOMMENDATIONS FOR POLICIES, STRATEGIES AND PROGRAMS

TABLE 20. MATRIX OF STRATEGIES, POLICIES AND PROGRAMS SET FOR THE PHILIPPINE SMALL RUMINANT INDUSTRY

Strategies	Programs/Policies/ Activities	Key Performance Indicators (KPIs)	Resources (in million PhP)	Timeframe	Who will do it?
KRA 1: Increased goat and sheep population by 30% and 175% in 2030 and 2040, respectively Issues/Constraints/Objectives being addressed: 1. Low in total production 2. Limited AI technicians and promotion of artificial insemination in small ruminants 3. Weak implementation of farm accreditation system for small ruminants 4. Inadequate government policies to support the SR input supply industry 5. Difficulty in accessing credit 6. Numerous municipal ordinances and cash points 7. No national program for sheep					
Herd Infusion	Herd infusion (island-born pure-bred) of stock farms, multiplier farms and organized farmers farms	Nos. of bucks procured and infused			**BAI, NDA**, FGASPAPI among other goat producers
		11,336	795.75	Short-term	
		14,170	1,532.59	Medium-term	
	Regional allocation for the procurement of local stocks	No. of regions provided with the budget to procure stocks			**DA-RFOs, LGUs**
		2,000	140.39	Short-term	
		2,500	270.39	Medium-term	

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Strategies	Programs/Policies/ Activities	Key Performance Indicators (KPIs)	Resources (in million PhP)	Timeframe	Who will do it?
Animal Distribution/ Dispersal	Animal distribution or dispersal	Nos. of animals distributed			DA-RFOs, LGUs, **BAI, NDA**
		13,336		Short-term	
		16,720		Medium-term	
		Nos. of farmer recipients/ beneficiaries			
		5,400		Medium-term	
	Develop information, education, and communication (IECs) for recipient farmers.	Nos. of printed materials (pcs.)			**BAI, NDA,** DA-RFOs
		13,336	0.56	Short-term	
		16,720	1.03	Medium-term	
		33,340	3.30	Long-term	
		Length of radio air time (hours)			
		32	20.66	Short-term	
Increase GAHP-compliant farms	Improve existing farms (i.e. adopting GAHP)	Nos. of farms improved			**FGASPAPI** among other goat producers
		40	9.74	Short-term	
		50	20.83	Medium-term	
		100	87.58	Long-term	
	Establish new farms (i.e. must be new members of the association)	Nos. of new farms established			**FGASPAPI** among other goat producers
		2,400	1,010.81	Short-term	
		3,000	1,946.80	Medium-term	
		6,000	8,184.84	Long-term	
		Nos. of SR multiplier farms established			
		120	269.55	Short-term	
		150	519.15	Medium-term	
		300	2,182.62	Long-term	
	Accredit more nucleus farms and SR multiplier farms	Nos. of nucleus farms and multiplier farms accredited			**BAI**
Application of reproductive biotechnologies to farms	Establish/strengthen AI center per region	Nos. of AI Centers established/ strengthened			DA-RFOs, LGUs, **BAI**
		16	87.50	Short-term	

Strategies	Programs/Policies/ Activities	Key Performance Indicators (KPIs)	Resources (in million PhP)	Timeframe	Who will do it?
	Introduce reproductive biotechnologies (i.e. artificial insemination, embryo transfer, among others)	Nos. of biotechnologies introduced/applied	22.50	Short-term	**PCC**, ISU-CVSRRC among other SUCs
			37.50	Medium-term	
			75.00	Long-term	
		Procurement of sexing machines for small ruminants			**PCC**
	Maintain and operationalize the National Center for Cryobanking in the PCC	National Center for Cryobanking established Nos. of years maintained			**PCC**, ISU-CVSRRC among other SUCs
		4	33.20	Short-term	
		5	41.50	Medium-term	
		20	83.00	Long-term	
	Allow the application of reproductive biotechnologies to farms	Nos. of farms that applied reproductive biotechnologies			**FGASPAPI** among other goat producers
Breeder Importation	Importation of genetically-superior animals (PL-480) (recipients must be only those willing and organized SR farmer associations)	Imported dairy goats			**BAI, NDA** FGASPAPI among other goat producers
		NDA-2,625	318.75	Short-term	
Supporting Policies & Programs	Provide credit windows to credible goat and sheep farmers	% increase in the nos. of SR farmers that accessed credit		Short-term	ACPC, Landbank, DBP, and other government banks
	Study the legal basis of imposing passing through fees and the possibility of removing them in the system	Amendment(s) of the existing laws/ regulations Remove Blue Tongue Test as requirement in shipping goats		Medium-term	**DA Policy**, LGUs
	One-Stop Shop Regulatory Body	One-Stop Shop Regulatory Office established		Medium-term	**Office of the Undersec-retary for Livestock**, BAI, NMIS, NDA
	Regulation on the slaughtering of female goats and sheep	Enactment of the law regulating the slaughtering of female goats and sheep		Short-term	BAI, **NMIS**

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Strategies	Programs/Policies/ Activities	Key Performance Indicators (KPIs)	Resources (in million PhP)	Timeframe	Who will do it?
	Review the farm accreditation system implementation for small ruminants	Farm accreditation system reviewed		Short-term	**BAI**, FGASPAPI among other SR producers
	Philippine Farm Act that will secure the funds for the agricultural programs and projects for the next 10 years	Philippine Farm Act enacted		Medium-term	**DA- Policy**, Budget; Office of the Undersecretary for Livestock
	Establish a National Program for Sheep	National Program for Sheep created		Short-Term	Office of the Undersecretary for Livestock, **BAI**, NMIS, AMAS
KRA 2: Conversion of smallhold farmers into agripreneurs Issues/Constraints/Objectives being addressed: 1. Limited budget to for the wider coverage of FLS –Goat Enterprise Module training modality in Visayas and Mindanao 2. Unorganized smallholder marketing in some areas					
Capability building to farmers	Conduct of Trainings of Trainers (TOT) using the FLS GEM plus Learn to Earn modality	Nos. of zones covered			**DA-ATI** with DA-BAI, CLSU among other SUCs and FGASPAPI
		141	49.94	Short-term	
		394	139.54	Medium-term	
	Make available the farms as training laboratories or demo farms	Nos. of farms available for training and demo purposes		Short-term	**FGASPAPI** among other goat producers
				Medium-term	
	Monitor and evaluate farmers trained	Nos. of zones monitored			**DA-ATI**, DA-BAI, DOST-PCAARRD, CLSU, DA-RFOs (with FGASPAPI)
		83	1.04	Short-term	
		452	4.81	Medium-term	
	Conduct of business orientation to SMEs	Nos. of business orientation conducted			FGASPAPI, with **DA-AMAS, OWWA**, NGO
		12	1.32	Short-term	
		12	1.96	Medium-term	
		20	5.76	Long-term	
	Conduct of Small Ruminant Congress	Nos. of Small Ruminant Congress conducted			**FGASPAPI** among other goat producers, NLP, BAI, NDA, NMIS
		1		Short-term	
		2		Medium-term	
		3		Long-term	

Strategies	Programs/Policies/ Activities	Key Performance Indicators (KPIs)	Resources (in million PhP)	Timeframe	Who will do it?
Training module development	Develop training module on sheep production (i.e. PCAARRD)	Nos. of module developed and printed	0.83	Short-term	**DA-ATI** in partnership with DA-BAI and DOST-PCAARRD
			0.81	Medium-term	
			3.42	Long-term	
Provision of technical assistance to farmers	Provide technical and business advisory	Nos. of farmers assisted			**DA-BAI** and DA-ATI
	Share farm production and financial performance data	Nos. of farms that shared their production and financial data			**FGASPAPI** among other goat producers
Supporting Policies & Programs	Regulation on the training for goat and sheep production	Enactment of the law regulating the training for goat and sheep production		Medium-term	**DA-ATI** with DA-BAI, TESDA, CLSU among other SUCs and FGASPAPI
	Strengthen the extension network	Nos. of trainings provided to agricultural extension workers (AEWs)		Short to Long-term	**DA-ATI**, DA-RFOs, LGUs, DA-BAI, FGASPAPI
		Nos. of vehicles procured and provided to AEWs		Short to Long-term	DA-RFOs, **LGUs**
KRA 3: Improved production efficiency Issues/Constraints/Objectives being addressed: 1. Low in total production and limited in productivity 2. Bureaucratic procurement system and weak implementation of regulatory standards for breeder goats 3. Absence of breed registry and recording system 4. Seasonal availability of forage 5. Weak implementation of animal health programs at the LGU level 6. Limited information on national sheep inventory 7. Absence of national performance data (ADG, FCR etc.) for sheep as basis for establishing standard					
Genetic improvement	Genetic Improvement Program for goats and sheep- by adopting a breeding plan, e.g. via ADGA for dairy goats	Nos. of farms adopting breeding plan			**BAI, NDA** with FGASPAPI among other goat producers
		Government-owned breeding centers			
		15	0.06	Short-term	
		15	0.15	Medium-term	

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Strategies	Programs/Policies/ Activities	Key Performance Indicators (KPIs)	Resources (in million PhP)	Timeframe	Who will do it?
		Zones			
		83	0.81	Short-term	
		452	2.88	Medium-term Long-term	
		Private farms			
		25		Short-term	
	Trainings with ADGA officials and users	Nos. of trainings conducted			**DA-ATI**, BAI, NDA, FGASPAPI among other goat producers
		3	4.97	Short-term	
		2	4.85	Medium-term	
	Establish breed and farm registry	Breed registry established Farm registry established			**BAI-NSRRDC**, Small Ruminant Center
	Establish a standard/ specification of an ideal dairy goat	PNS for dairy goat developed			**BAFS** in coordination with BAI and FGASPAPI
		1	0.10	Short-term	
Nutrition improvement	Develop/access to new feeding guides that will improve the production performance	Nos. of years with access to feeding guides			**DA-ATI**, BAI, NDA, DA-RFOs in partnership with SUCs
		4	0.80	Short-term	
		5	1.00	Medium-term	
		10	2.00	Long-term	
	Establish forage seedling nurseries	Nos. of forage seedling nurseries established			**BAI**, DA-RFOs
		Regions			
		13	1.3	Short-term	
		Provinces			**FGASPAPI** among other goat producers
		27	3.01	Short-term	
		50	8.13	Medium-term	
	Establish pasture and forage production areas per region	Size of the production areas of pasture and forage establishment (in thousand)			**BAI**, DA-RFOs
		455	4,550.00	Short-term	
		2,150	21,500.00	Medium-term	

Strategies	Programs/Policies/ Activities	Key Performance Indicators (KPIs)	Resources (in million PhP)	Timeframe	Who will do it?
	Development of machineries for local forage production	Nos. of machineries developed	10.0	Short-term	**PHILMECH**, BAFE, BAI, NDA, BAR
			15.0	Medium-term	
Farm management improvement	Establish a unified farm recording system (i.e. animal performance and evaluation)	Unified farm recording system established			**BAI-NSRRDC, NDA**
		Nos. of personnel			
		60	7.49	Short-term	
		150	18.73	Medium-term	
	Adopt GAHP for goat & sheep	Nos. of farms that were GAHP-compliant		Short-term Medium-term Long-term	FGASPAPI among other goat producers
	Proper herd management	Nos. of farms with proper herd management		Short-term Medium-term Long-term	**FGASPAPI** among other goat producers
Research and Development	Conduct of researches on small ruminant (e.g. right feeding, new feed resources, diseases, breeding, among others)	Nos. of R&D projects conducted			**BAI**, NDA, DOST-PCAARRD, SUCs, DA-RFOs
		30	150.00	Short-term	
		50	250.00	Medium-term	
		100	500.00	Long-term	
Health/disease management	Disease surveillance	Nos. of diseases covered			**BAI**, LGUs
		2	8.00	Short-term	
		2	10.00	Medium-term	
		2	20.00	Long-term	
	Empower the government veterinarians for small ruminants through continuous education (i.e. trainings, graduate studies)	Nos. of local trainings conducted			**BAI, NDA**, PCSRP
		9	2.48	Short-term	
		15	6.09	Medium-term	
		30	20.61	Long-term	
		Nos. of local trainings conducted			
		2	1.11	Short-term	
		2	1.54	Medium-term	
		5	5.41	Long-term	

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Strategies	Programs/Policies/ Activities	Key Performance Indicators (KPIs)	Resources (in million PhP)	Timeframe	Who will do it?
Supporting Policies & Programs	Strengthen the implementation of regulatory standards for breeder goats	Regulatory standards/ specifications for breeder goats established		Long-term	**BAI, NDA**
	Strengthen the implementation of animal health programs at the LGU level	% reduction in disease occurrence and mortality of the SR		Short-term	BAI, **LGUs**
	Include the sheep in the list of livestock commodity regularly monitored by the Philippine Statistics Authority (PSA).	Available inventory, production, trade and price data of SR		Medium-term	**PSA**, BAI, NDA, NMIS, AMAS, LGUs
	Private sector to take the initiative on "National Goat Farm Production Performance Monitoring System"	"National Goat Farm Production Performance Monitoring System" established		Short-term	**FGASPAPI** among other goat producers
KRA 4: Developed allied enterprises for goat and sheep Issues/Constraints/Objectives being addressed: 1. Lack of promotion on chevon and lamb 2. Lack of standards relative to live goat and sheep, meat (lamb and mutton) grading and processing standards 3. Lack of quality standards for lamb, mutton and goat's milk					
SR Allied Industries Promotion	Promote chevon and mutton-based products	Nos. of IEC materials printed, pcs.			**NMIS**, BAI, DA-ATI
		1,500	0.28	Short-term	
		2,500	0.68	Medium-term	
		5,000	2.80	Long-term	
	Promote non-food allied industries, e.g. leather	Nos. of IEC materials printed, pcs.			**BAI**, DA-ATI
		1,500	0.14		
		2,500	0.34		
		5,000	1.40		

Strategies	Programs/Policies/ Activities	Key Performance Indicators (KPIs)	Resources (in million PhP)	Timeframe	Who will do it?
	Promote vermiculture	Nos. of IEC materials printed, pcs.			**BSWM**, BAI, DA-ATI
		750	0.14	Short-term	
		1,250	0.34	Medium-term	
		2,500	1.40	Long-term	
	Conduct promotional activities on SR allied industries	Nos. of promotional activities conducted			DA-ATI, **BAI, NDA**
		8	2.59	Short-term	
		12	5.58		
		25	24.40	Long-term	
Commercial-ization	Commercialize all the developed allied enterprises	Nos. of allied enterprises commercialized			**FGASPAPI** among other goat producers (small hold thru cooperatives and farmers' associations)
	Develop quality standards on food and non-food products (e.g. personal care, leather, among others)	PNS developed • Slaughtering practices for Lamb/mutton • Lamb/mutton cuts • Goat's leather	0.30	Medium-term	**BAFPS**, BAI, NDA, NMIS, SUCs, FGASPAPI among other goat producers

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Strategies	Programs/Policies/ Activities	Key Performance Indicators (KPIs)	Resources (in million PhP)	Timeframe	Who will do it?
KRA 5: Increased dairy goat farmers by 27% Issues/Constraints/Objectives being addressed: 1. Lack of promotion on chevon, lamb and goat's milk 2. Low private sector investments on small ruminant post-harvest facilities 3. Lack of consultation with the stakeholders regarding the SR programs					
Marketing assistance and promotion of goat's products	Provide assistance in the marketing of goat products (e.g. buy back scheme)	Nos. of farmers assisted			NDA, BAI, **DA-AMAS**
	Include goat's milk in the milk feeding program	Nos. of students benefited			**DepEd**, NDA, DSWD, FNRI, LGUs
		19,860	57.19	Short-term	
		131,280	378.09	Medium-term Long-term	
	Promote goat's milk consumption and its health benefits thru IECs and seminars	Nos. of IEC materials printed, pcs.			**DA-ATI**, NDA, DOH-FNRI, FGASPAPI among other goat producers
		1,500	0.28	Short-term	
		2,500	0.68	Medium-term	
		5,000	2.80	Long-term	
	Linkage with other agencies/groups associated in promoting goat's milk health benefits (e.g. DOH-FNRI, DepEd, DSWD, DTI, LGUs, NGOs)	Nos. of linkages created			**FGASPAPI** among other goat producers (small hold thru cooperatives and farmers' associations)
Provision of post-harvest facilities and equipment	Establish small-scale milk processing in targeted areas	Nos. of small-scale milk processing established			**NDA**
		1	3.00		
		2	7.92		
	Make available portable milk pasteurizers per dairy zone	Nos. of beneficiaries			**NDA**
		Dairy zones		Short-term	
		80	4.15	Medium-term	
		452	22.6	Long-term	
		Extra		Short-term	
		30	1.50	Medium-term	
		50	2.50	Long-term	

Strategies	Programs/Policies/ Activities	Key Performance Indicators (KPIs)	Resources (in million PhP)	Timeframe	Who will do it?
	Establish halal-compliant slaughterhouses for goats and sheep	Nos. of halal-compliant slaughterhouses for SR Established			**NMIS**
		2	330.00	Short-term	
		3	786.24	Medium-term	
		Developed standards on SR slaughterhouses			
		1		Short-term	
		Government Expenses	6,311.48	Short-term	
			25, 097.12	Medium-term	
			8,522.02	Long-term	
			39,930.62	**Sub-Total**	
		Private Expenses	1,322.49	Short-term	
			2,613.25	Medium-term	
			10,463.61	Long-term	
			14,399.35	**Sub-Total**	
		Total Expenses	7,633.97	Short-term	
			27,710.37	Medium-term	
			18,985.63	Long-term	
			54,329.97	**Sub-Total**	

*Those in bold letters are the proposed leads of the programs/policies/activities

INDUSTRY CLUSTER GOVERNANCE NETWORK (IMPLEMENTATION TEAM)

TABLE 21. GENERAL GOVERNANCE NETWORK FOR THE IMPLEMENTATION AND MONITORING OF THE PHILIPPINE SMALL RUMINANT INDUSTRY ROADMAP

Role	Actors	Responsibilities
Steering Committee (SC)	Chair: FGASPAPI President Co- Chair: Undersecretary for Livestock Members: 1 BAI 1 NMIS 1 NDA 1 ATI 1 BAR 1 DOST-PCAARRD 1 CLSU-SRC 1 PCSRP 3 FGASPAPI members (1 for each of the following sectors: dairy goat, meat goat and sheep sectors) Secretariat: BAI (interim) until the industry is able to establish itself and stand by itself	1. Oversee the implementation of all plans, R&D projects and initiatives related to small ruminants that are aligned with the set priorities of the Small Ruminant Industry Roadmap at a given period; 2. Ensure that funds will be made available to implement approved R&D projects and initiatives; 3. Monitor and ensure the successful implementation of the plans, projects and initiatives of the TWGs; 4. Deliberate on the resolutions and policy recommendations based on the submitted reports of the TWGs and forward them to the concerned government agencies, private companies, industry groups and associations to facilitate addressing the industry challenges and issues; 5. Facilitate the updating of the Small Ruminant Industry Roadmap; and 6. Conduct quarterly and special meetings to resolve pressing matters within the set programs

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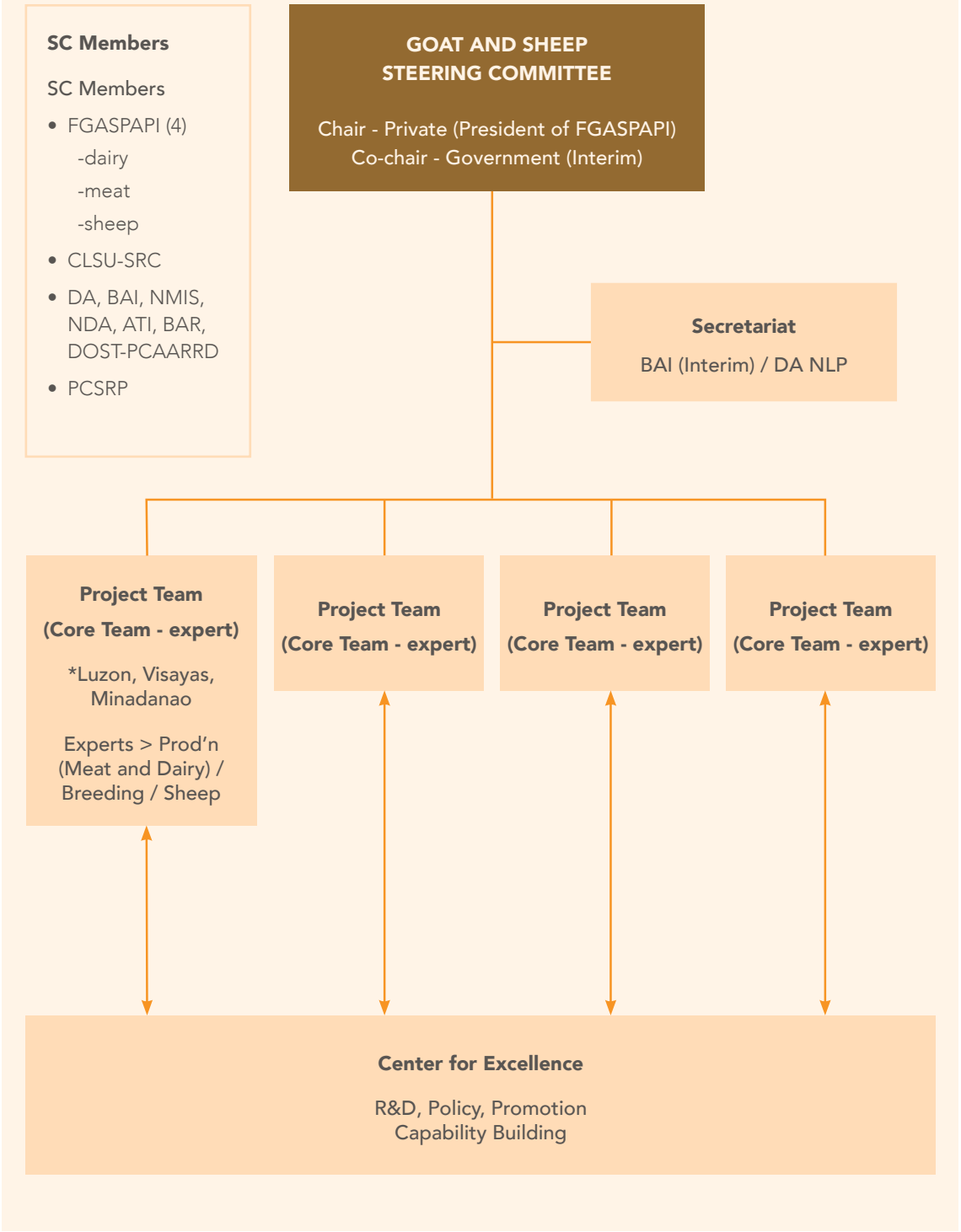
Role	Actors	Responsibilities
Project Core Teams: • Farm Production (Meat and Dairy)/Breeding • Post-Harvest • Meat and Milk Processing • Logistics and Marketing	Chair: FGASPAPI Focal Persons in Luzon, Visayas and Mindanao Co-Chair and members are to be determined	1. Contribute in the updating of the Small Ruminant Industry Roadmap and timeline; 2. Prepare their respective work and budget plans based on the set priority action programs of the Steering Committee; 3. Implement all the set projects, activities and other initiatives approved by the Steering Committee; 4. Monitor and evaluate the status of all projects, activities and other initiatives vis-à-vis the set targets and objectives in the roadmaps; 5. Conduct meetings to discuss issues and concerns involving their respective project core team and submit report and recommendations to the Steering Committee for their deliberation and policy recommendations, and; 6. Connect with the Center for Excellence in the academe, research and development, policy, promotion and capability building for the implementation of various programs, projects, policies and activities
Monitoring Committee	Philippine Council for Agriculture and Fisheries (PCAF) as the lead	Monitor and ensure the successful implementation of the plans, projects and initiatives indicated in the roadmap. Monitoring will be based on the targets being set, the expenditures being invested and most importantly, if the industry is achieving the technical parameters that they set.

FIGURE 27. PROPOSED IMPLEMENTATION STRUCTURE FOR THE SMALL RUMINANT INDUSTRY ROADMAP



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APPENDICES

APPENDIX 1 TECHNICAL ASSUMPTIONS FOR GOAT PRODUCTION

Carrying Capacity Housing (m2)	50 animals/ha
Does	1.5/head
Bucks	2.0/head
Growing	1.0/head
Type of housing and fencing materials	Permanent/Semi-permanent
Male to Female Ratio	1:25
Conception Rate	80%
Kid Size	1.5
Kidding per year	1.5/year
Culling Rate	10%
Concentrate Consumption	100g/day/head x 180 days
Forage Consumption	5 kg/day
Kinds of Forage	Napier and leguminous species
Mortality Rate	
Matured	5%
Growing	10%
Kids	20%

APPENDIX 2 FINANCIAL ASSUMPTIONS FOR GOAT PRODUCTION

Housing	P40,000 to P150,000
Fencing	P25,000 to P 100,000
Land Rent	P500 to P2,000
Cost of Stocks	
Does/Ewes (upgraded: 50N:50AN)	P2,500/head to P3, 500/head
Buck/Ram	P12,000/head to P39,000/head
Labor	P4,000 to P6,000 per month
Concentrate Feed	P6,000/month to P74,000/month
Veterinary Drugs and Supplies	P2,000/month to P14,000/month
Forage and Pasture Development	P 25,000 to P 200,000
Forage and Pasture Maintenance	P2,000 to P10,000
Price of Fattener	P3,000/head to P3,500/head
Price of Breeder	P13,000/head to P15,000/head
Average Marketable Weight	20 Kg
Life Span of Housing and Fence	10 Years
Rate of Interest on Capital	16%/annum

APPENDIX 3 TOTAL PROJECT COST FOR A BREEDER GOAT FARM (100-DOE LEVEL)

Housing	150,000	
Fencing	100,000	
Forage & Pasture Development	200,000	
Prepaid Expenses	50,000	
Stocks		
Doe (100)	250,000	
Buck (4)	120,000	
Working Capital	60,000	
Sub-Total	930,000	
Distribution of Equity and Loan for the Project		
Equity	465,000	465,000
Loan	465,000	465,000
Total	930,000	100%

APPENDIX 4 SCHEDULE OF AMORTIZATION FOR ABREEDER GOAT FARM (100-DOE LEVEL) PROJECT

	1	2	3	4	5
Balance of Principal	465,000	465,000	373,221	266,757	143,259
Principal Repayment		91,779	106,464	123,499	143,259
Interest	74,400	74,400	59,715	42,681	22,921
Level Payment		166,179	166,179	166,180	166,180

APPENDIX 5 PROJECTED BALANCE SHEET FOR A BREEDER GOAT FARM (100-DOE LEVEL) PROJECT, YEARS 1-5 PROJECT

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
ASSETS						
CURRENT ASSETS						
Cash in Bank	60,000	548,677	1,547,297	1,926,705	2,914,222	3,891,252
Stocks Inventory						
Doe (100)	250,000	250,000	250,000	250,000	250,000	-
Buck (4)	120,000	120,000	120,000	120,000	120,000	-
Forage & Pasture Development	200,000	160,000	120,000	80,000	40,000	-
Prepaid Expenses	50,000	40,000	30,000	20,000	10,000	-
Total Current Assets	680,000	1,118,677	2,067,297	2,396,705	3,334,222	3,891,252
FIXED ASSETS						
Housing	150,000	135,000	120,000	105,000	90,000	75,000
Fencing	100,000	90,000	80,000	70,000	60,000	50,000
Total Fixed Assets	250,000	225,000	200,000	175,000	150,000	125,000
TOTAL ASSETS	**930,000**	**1,343,677**	**2,267,297**	**2,571,705**	**3,484,222**	**4,016,252**
LIABILITIES AND EQUITY						
LONG TERM LIABILITIES						
Long Term Debt (Commercial Bank Loans	465,000	465,000	373,221	266,757	143,259	(0)
Total Long-Term Liabilities	465,000	465,000	373,221	266,757	143,259	(0)
STOCKHOLDER'S EQUITY						
Paid-up Capital	465,000	465,000	465,000	465,000	465,000	465,000
Retained Earnings		413,677	1,429,076	1,839,948	2,875,964	3,551,252
Total Equity	465,000	878,677	1,894,076	2,304,948	3,340,964	4,016,252
TOTAL LIABILITIES & EQUITY	930,000	1,343,677	2,267,297	2,571,705	3,484,222	4,016,252

APPENDIX 6 TOTAL PROJECT COST FOR A MEAT-TYPE GOAT FARM (25-DOE LEVEL)

Housing	40,000	
Fencing	25,000	
Forage & Pasture Development	25,000	
Prepaid Expenses	25,000	
Stocks		
Doe (25)	62,500	
Buck (1)	30,000	
Working Capital	20,000	
Sub-Total	227,500	
Distribution of Equity and Loan for the Project		
Equity	113,750	50%
Loan	113,750	50%
Total	227,500	100%

APPENDIX 7 SCHEDULE OF AMORTIZATION FOR A MEAT-TYPE GOAT FARM (25-DOE LEVEL) PROJECT

	1	2	3	4	5
Balance of Principal	113,750	113,750	91,299	65,256	35,045
Principal Repayment		22,451	26,043	30,211	35,045
Interest	18,200	18,200	14,608	10,441	5,607
Level Payment		40,651	40,651	40,652	40,652

APPENDIX 8 PROJECTED BALANCE SHEET FOR A MEAT-TYPE GOAT FARM (25-DOE LEVEL) PROJECT, YEARS

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
ASSETS						
CURRENT ASSETS						
Cash in Bank	20,000	88,070	241,183	281,644	432,041	621,781
Accounts Receivable						
Stocks Inventory						
Doe (100)	250,000	250,000	250,000	250,000	250,000	-
Buck (4)	120,000	120,000	120,000	120,000	120,000	-
Forage & Pasture Development	200,000	160,000	120,000	80,000	40,000	-
Prepaid Expenses	50,000	40,000	30,000	20,000	10,000	-
Total Current Assets	162,500	220,570	363,683	394,144	534,541	621,781
FIXED ASSETS						
Housing	40,000	36,000	32,000	28,000	24,000	20,000
Fencing	25,000	22,500	20,000	17,500	15,000	12,500
Total Housing and Equipment	***65,000***	***58,500***	***52,000***	***45,500***	***39,000***	***32,500***
Total Fixed Assets						
TOTAL ASSETS	**227,500**	**279,070**	**415,683**	**439,644**	**573,541**	**654,281**
LIABILITIES AND EQUITY						
LONG TERM LIABILITIES						
Long Term Debt (Commercial Bank Loans	113,750	113,750	91,299	65,256	35,045	(0)
Total Long-Term Liabilities	113,750	113,750	91,299	65,256	35,045	(0)
STOCKHOLDER'S EQUITY						
Paid-up Capital	113,750	113,750	113,750	113,750	113,750	113,750
Retained Earnings		51,570	210,634	260,639	424,746	540,531
Total Equity	113,750	165,320	324,384	374,389	538,496	654,281
TOTAL LIABILITIES & EQUITY	227,500	279,070	415,683	439,644	573,541	654,281

APPENDIX 9 TOTAL PROJECT COST FOR A DAIRY GOAT FARM (25-DOE LEVEL)

Housing	100,000	
Fencing	25,000	
Forage & Pasture Development	40,000	
Refrigerators	20,000	
Freezers	20,000	
Prepaid Expenses	20,000	
Stocks		
Doe (25)	62,500	
Buck (1)	12,000	
Working Capital		40,500
Sub-Total	340,000	
Distribution of Equity and Loan for the Project		
Equity	170,000	170,000
Loan	170,000	170,000
Total	340,000	100%

APPENDIX 10 SCHEDULE OF LOAN AMORTIZATIONA DAIRY GOAT FARM (25-DOE LEVEL) PROJECT

	Year 1	Year 2	Year 3	Year 4	Year 5
Balance of Principal	170,000	170,000	136,446	97,523	52,373
Principal Repayment		33,554	38,923	45,150	52,373
Interest	27,200	27,200	21,831	15,604	8,380
Level Payment		60,754	60,754	60,754	60,753

APPENDIX 11 PROJECTED BALANCE SHEET FORA DAIRY GOAT FARM (25-DOE LEVEL) PROJECT, YEARS 1-5

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
ASSETS						
CURRENT ASSETS						
Cash in Bank	40,500	303,560	523,479	738,105	953,965	1,286,810
Stocks Inventory						
Doe (100)	62,500	62,500	62,500	62,500	62,500	-
Buck (4)	12,000	12,000	12,000	12,000	12,000	-
Forage & Pasture Development	40,000	32,000	24,000	16,000	8,000	-
Prepaid Expenses	20,000	16,000	12,000	8,000	4,000	-
Total Current Assets	*175,000*	*426,060*	*633,979*	*836,605*	*1,040,465*	*1,286,810*
FIXED ASSETS						
Housing	100,000	90,000	80,000	70,000	60,000	50,000
Fencing	25,000	22,500	20,000	17,500	15,000	12,500
Freezers and Refrigerators	40,000	36,000	32,000	28,000	24,000	20,000
Total Fixed Assets	***165,000***	***148,500***	***132,000***	***115,500***	***99,000***	***82,500***
TOTAL ASSETS	**340,000**	**574,560**	**765,979**	**952,105**	**1,139,465**	**1,369,310**
LIABILITIES AND EQUITY						
LONG TERM LIABILITIES						
Long Term Debt (Commercial Bank Loans	170,000	170,000	136,446	97,523	52,373	(0)
STOCKHOLDER'S EQUITY						
Paid-up Capital	170,000	170,000	170,000	170,000	170,000	170,000
Retained Earnings		234,560	459,533	684,582	917,092	1,199,310
Total Equity	170,000	404,560	629,533	854,582	1,087,092	1,369,310
TOTAL LIABILITIES & EQUITY	**340,000**	**574,560**	**765,979**	**952,105**	**1,139,465**	**1,369,310**

APPENDIX 12 TOTAL PROJECT COST FOR A SLAUGHTER SHEEP FARM (25-EWE LEVEL)

Housing	40,000	
Fencing	50,000	
Forage & Pasture Development	25,000	
Prepaid Expenses	20,000	
Stocks		
Ewe (25)	87,500	
Ram (1)	25,000	
Working Capital	20,000	
Sub-Total	267,500	
Distribution of Equity and Loan for the Project		
Equity	133,750	50%
Loan	133,750	50%
Total	267,500	100%
Loan	170,000	170,000
Total	340,000	100%

APPENDIX 13 SCHEDULE OF AMORTIZATION FOR A SLAUGHTER SHEEP FARM (25-EWE LEVEL) PROJECT

	1	2	3	4	5
Balance of Principal	133,750	133,750	107,351	76,728	41,206
Principal Repayment		26,399	30,623	35,522	41,206
Interest	21,400	21,400	17,176	12,277	6,593
Level Payment	21,400	47,799	47,799	47,799	47,799

APPENDIX 14 PROJECTED BALANCE SHEET FORA SLAUGHTER SHEEP FARM (25-EWE LEVEL), YEARS 1-5

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
ASSETS						
CURRENT ASSETS						
Cash in Bank	20,000	111,034	412,965	502,146	804,077	1,005,758
Stocks Inventory						
Doe (100)	87,500	87,500	87,500	87,500	87,500	-
Buck (4)	25,000	25,000	25,000	25,000	25,000	-
Forage & Pasture Development	25,000	20,000	15,000	10,000	5,000	-
Prepaid Expenses	20,000	16,000	12,000	8,000	4,000	-
Total Current Assets	*177,500*	*259,534*	*552,465*	*632,646*	*925,577*	*1,005,758*
FIXED ASSETS						
Housing	40,000	36,000	32,000	28,000	24,000	20,000
Fencing	50,000	45,000	40,000	35,000	30,000	25,000
Total Housing and Equipment	**90,000**	**81,000**	**72,000**	**63,000**	**54,000**	**45,000**
Total Fixed Assets						
TOTAL ASSETS	**267,500**	**340,534**	**624,465**	**695,646**	**979,577**	**1,050,758**
LIABILITIES AND EQUITY						
LONG TERM LIABILITIES						
Long Term Debt (Commercial Bank Loans)	133,750	133,750	107,351	76,728	41,206	(0)
STOCKHOLDER'S EQUITY	133,750	133,750	107,351	76,728	41,206	(0)
Paid-up Capital	133,750	133,750	133,750	133,750	133,750	133,750
Retained Earnings	-	73,034	383,364	485,168	804,622	917,009
Total Equity	**133,750**	**206,784**	**517,114**	**618,918**	**938,372**	**1,050,759**
TOTAL LIABILITIES & EQUITY	**267,500**	**340,534**	**624,465**	**695,646**	**979,577**	**1,050,759**

APPENDIX 15 FIVE-YEAR IMPLEMENTATION PLAN (2022-2026)

Industry Vision, Mission and Goals

Industry Vision

"A competitive and sustainable Philippine goat and sheep industry by 2026."

Industry Mission

"Capacitating the goat and sheep industry stakeholders using a science and technology-based modality, and adopting economically-viable and environmentally- sound value chain practices, in order to provide healthy food for the Filipinos and the global community."

Industry Goals, Objectives and Targets

	2022-2026
Goal 1: To improve the quantity of quality goat and sheep by 2040.	
Objectives	Increase the population of quality goat and sheep by 7% from the baseline of 3.81M (2020) and 0.049M (2010)
Targets	
Goat	4,086,752
Sheep	53,319
Objectives	Improve production efficiency
Targets for Meat-Type Goat	
Average Daily Gain (g/day)	
Native	50-60
Upgrades	100
Slaughter weight at 10 months, kgs	15
Kidding interval, days	300
Kidding size*	1.5
Pre-weaning mortality, %	30
Targets for Dairy-Type Goat	
Milking period, days	90
Milk production, L/day	0.5
Pre-weaning mortality, %	25
Goal 2: To promote enterprise development along the value chain	
Objectives	Increase goat farmers by 13% from the baseline 659,772 (2014)
Targets	745,542

*Assumptions: Good genetics and best management practices (i.e. feeds and feeding management, health management and regular husbandry practices) are made available to smallhold farmers.

Responsibility Matrix

Action/ Strategy/ Description	Program/Activity/Project	Physical Targets						Financial Targets						Responsibility Entity
		2022	2023	2024	2025	2026	Total	2022	2023	2024	2025	2026	Total	
KRA 1: Increased goat and sheep population by 10% in 2026														
Herd Infusion	Herd infusion (island-born pure-bred) of stock farms, multiplier farms and organized farmers' farm													BAI, NDA, FGASPAPI among other goat producers
	No. of Bucks procured and infused	2,834	2,834	2,834	2,834	2,834	14,170	171.46	188.61	207.47	228.21	251.03	1046.78	
	No. of Rams procured and infused	500	500	500	500	500	2,500	30.25	33.28	36.60	40.26	44.29	184.68	
Animal Distribution/ Dispersal	Animal distribution or dispersal													DA-RFOs, LGUs, BAI, NDA
	No. of animals distributed	3,334	3,334	3,334	3,334	3,334	16,670							
	Developed information, education, and communication (IECs) for recipient farmers													BAI, NDA, DA-RFOs
	No. of printed materials, pcs	3,334	3,334	3,334	3,334	3,334	16,670	0.12	0.13	0.15	0.16	0.18	0.73	
	Length of radio airtime, hours	8	8	8	8	8	40	4.42	4.86	5.42	5.96	6.56	27.22	
Increase GAHP compliant farms	Impove existing farms (i.e. adopting GAHP)													FGASPAPI among other goat producers
	No. of improved farms	10	10	10	10	10	50	1.82	2.00	2.82	3.10	3.41	13.16	
	Establish new farms (i.e. must be new members of the association)													
	No. of farms improved	600	600	600	600	600	3,000	217.8	239.58	263.538	289.8918	318.881	1329.69	
	No. of SR multiplier farms established	30	30	30	30	30	150	58.08	63.888	70.2768	77.30448	85.03493	354.58	
Application of reproductive biotechnologies to farms	Establish/strengthen AI center per region													DA-RFOs, LGUs, BAI
	No. of AI centers established/strengthened		6	5	5		16		30.00	27.50	30.00		87.50	
	Introduce reproductive biotechnologies (i.e. artificial insemination, embryo transfer, among others)													PCC, ISU-CVSRRC among other SUCs
	No. of biotechnologies introduced/applied							7.50	7.50	7.50	7.50	7.50	37.50	
	Maintain and operationalize the National Center for Cryobanking in the PCC													PCC, ISU-CVSRRC among other SUCs
	No. of years maintained	1	1	1	1	1	5	8.30	8.30	8.30	8.30	8.30	41.50	
	Allow the application of reproductive biotechnologies to farms													FGASPAPI among other goat producers
	No. of farms that applied reproductive biotechnologies													
KRA 2: Conversion of smallhold farmers into agripreneur														
Capability building to farmers	Conduct Trainings of Trainers (TOT) using the FLS GEM plus Learn to Earn modality													DA-ATI with DA_ BAI, CLSU among other SUCs
	No. of zones covered	12	26	45	58	84	225	4.25	9.21	15.94	20.54	29.75	76.69	
	Make available the farms as training laboratories or demo farms													FGASPAPI among other goat producers
	No. of farms available for training and demo purposes													
	Monitor and evaluate farmers trained													DA_ATI , DA-BAI, DOST
	No. of zones monitored		12	26	45	58	141		0.15	0.33	0.56	0.73	1.77	
	Conduct business orientation to SMEs													FGASPAPI with DA-AMAS, OWWA, NGO
	No. of business orientation conducted		4	4	4	4	16		0.40	0.44	0.48	0.53	1.8564	
Training module	Develop training module on sheep production (i.e. PCAARRD)													DA-ATI in partnership with DA_BAI and DOST-PCAARRD
	No. of module developed and printed	1						0.50	0.10	0.11	0.12	0.13	0.9641	

Action/ Strategy/ Description	Program/Activity/Project	Physical Targets						Financial Targets						Responsibility Entity
		2022	2023	2024	2025	2026	Total	2022	2023	2024	2025	2026	Total	
KRA 3: Improved production efficiency														
Genetic Improvement	Genetic Improvement program for goats and sheep by adopting a breeeding plan, e.g. via ADGA for dairy goats													BAI, NDA, FGASPAPI among other goat producers
	No. of farms adopting breeding plan													
	* Government-woned breeding centers		5	5	5	5	20		0.01	0.02	0.03	0.03	0.09	
	* Zones		12	26	45	58	141		0.51	0.11	0.19	0.28	1.09	
	* Farms		10	10	5		25							
	Trainings with ADGA officials and users													DA-ATI, BAI, NDA, FGASPAPI among other goat producers
	No. of trainings conducted		1	1	1		3		1.50	1.65	1.82		4.97	
	Establish breed and farm registry													BAI-NSRRDC, Small Ruminant Center
	Breed registry established													
	Unified farm recording system established													
	No. of personnel		10	20	30	40	100							
	Establish a standard/specification of an ideal dairy goat													BAFS in coordination with BAI and FGASPAPI
	PNS for dairy goat developed			1			1			0.10			0.10	
Nutrition Improvement	Develop/access to new feeding guides													DA-ATI, BAI, BDA, DA-RFOs
	No. of years with access to feeding guides	1	1	1	1	1	5	0.20	0.20	0.20	0.20	0.20	1.00	
	Establish forage seedling nurseries													BAI, DA-RFOs, FGASPAPI among other goat producers
	No. of forage seedling nurseries established													
	Regions		5	5	3		13		0.50	0.50	0.30		1.30	
	Provinces		7	10	10	10	37		0.7	1.1	1.21	1.33	4.34	
	Establish pasture and forage production areas per region (mechanized)													BAI, DA-RFOs
	Size of the production areas of pasture and forage establishment (in thousand hectares per region)		125	165	165	190	645		1,250	1,650	1,650	1,900	6,450	
	Development of machineries for local forage production													PHILMECH, BAFE, BAI, NDA, BAR
	No. of machineries developed								4.00	3.00	3.00	3.00	13.00	
Farm Management Improvement	Establish a unified farm recording system													BAI-NSRRDC, NDA
	Unified farm recording system established													
	No. of personnel		10	20	30	40	100		1.25	2.50	3.74	5.00	12.49	
	Adopt GAHP for goat and sheep													FGASPAPI among other goat producers
	No. of farms that were GAHP-compliant													
	Proper herd management													FGASPAPI among other goat producers
	No. of farms with proper herd management													
Health Disease and Management	Disease surveillance													BAI, LGUs
	No. of diseases covereed (CAE and Blue-Tongue)	2	2	2	2	2	10	2.00	2.00	2.00	2.00	2.00	10.00	
	Empower the government veterinarians for Small Ruminants													BAI, NDA, PCSRP
	No. of local trainings provided		3	3	3	3	12		0.75	0.83	0.91	1.00	3.48	
	No. of international studies attended		1		1		2		0.5		0.61		1.11	
Research	Conduct researches on Small Ruminants													BAI, NDA, DOST-PCAARRD, SUCs, DA-RFOs
	No. of R&D projects conducted		1	1	1	1	4		5.00	5.00	5.00	5.00	20.00	

Action/ Strategy/ Description	Program/Activity/Project	Physical Targets						Financial Targets						Responsibility Entity
		2022	2023	2024	2025	2026	Total	2022	2023	2024	2025	2026	Total	
KRA 4: Developed allied enterprises for goat and sheep														
SR Allied Industries Promotion	Promote chevon and mutton-based products													NMIS, BAI, DA-ATI
	No. of IEC materials printed, pcs.		500	500	500	500	2000		0.08	0.1	0.1	0.12	0.4	
	Promote non-food allied industries, e.g. leather													BAI, DA-ATI
	No. of IEC materials printed, pcs.		250	250	250	250	1000		0.04	0.05	0.05	0.06	0.20	
	Promote vermiculture													BSWM, BAI, DA-ATI
	No. of IEC materials printed, pcs.		250	250	250	250	1000		0.04	0.05	0.05	0.06	0.20	
	Conduct promotional activities on SR allied industries													DA-ATI, BAI, NDA
	No. of promotional activities conducted		3	2	3	2	10		0.9	0.6	1.09	0.73	3.32	
Standards Development	Develop quality standards on food and non-food products (e.g, personal care, leather, among others)													BAFPS, BAI, NDA, NMIS, SUCs, FGASPAPI among other goat producers
	PNS developed					1	1					0.10	0.10	
KRA 5: Increased dairy goat farmers by 27%														
Marketing assistance and promotion of goat's products	Provide assistance in the marketing of goat products (e.g. buy back scheme)													NDA, BAI. DA-AMAS
	No. of of farmers assisted													
	Include goat's milk in the milk feeding program													DepEd, NDA, DSWD, FNRI, LGUs
	Nos. of students benefited		2,800	5,460	11,520	28,080	47,940		8.3	15.7	33.2	80.9	138.1	
	Promote goat's milk consumption and its health benefits through IECs and seminars													DA-ATI, NDA, DOH-FNRI, FGASPAPI among other goat producers
	No. of IEC materials printed, pcs		500	500	500	500	2,000		0.08	0.10	0.10	0.12	0.4	
	Linkage with other agencies/groups associated in promoting goat's milk health benefits (e.g. DOH-FNRI, DepEd, DSWD, DTI, LGUs, NGOs)													FGASPAPI among other goat producers (smallhold through cooperatives and farmers')
	No. of linkages created													
Provision of post-harvest facilities and equipment	Establish small-scale milk processing in targeted areas													NDA
	No. of small-scale milk processing established			1			1			3.00			3.00	
	Make available portable milk pasteurizers per dairy zone													NDA
	No. of dairy zones beneficiaries		12	26	45	58	141		0.60	1.30	2.25	2.90	7.1	
	Extra		10	10	10	10	40		0.50	0.50	0.50	0.50	2.0	
	Establish halal-compliant slaughterhouses for goats and sheep													NMIS
	No. of halal-compliant slaughterhouses for SR established		1	1		1	3		150.00	180.00		216.00	546.00	

Institutional Arrangement

Role	Actors	Responsibilities
Steering Committee (SC)	Chair: FGASPAPI President Co- Chair: Undersecretary for Livestock Members: 1 BAI 1 NMIS 1 NDA 1 ATI 1 BAR 1 DOST-PCAARRD 1 CLSU-SRC 1 PCSRP 3 FGASPAPI members (1 for each of the following sectors: dairy goat, meat goat and sheep sectors) Secretariat: BAI (interim) until the industry is able to establish itself and stand by itself	1. Oversee the implementation of all plans, R&D projects and initiatives related to small ruminants that are aligned with the set priorities of the Small Ruminant Industry Roadmap at a given period; 2. Ensure that funds will be made available to implement approved R&D projects and initiatives; 3. Monitor and ensure the successful implementation of the plans, projects and initiatives of the TWGs; 4. Deliberate on the resolutions and policy recommendations based on the submitted reports of the TWGs and forward them to the concerned government agencies, private companies, industry groups and associations to facilitate addressing the industry challenges and issues; 5. Facilitate the updating of the Small Ruminant Industry Roadmap; and 6. 6. Conduct quarterly and special meetings to resolve pressing matters within the set programs
Project Core Teams: • Farm Production (Meat and Dairy)/ Breeding • Post-Harvest • Meat and Milk Processing • Logistics and Marketing	Chair: FGASPAPI Focal Persons in Luzon, Visayas and Mindanao Co-Chair and members are to be determined	1. Contribute in the updating of the Small Ruminant Industry Roadmap and timeline; 2. Prepare their respective work and budget plans based on the set priority action programs of the Steering Committee; 3. Implement all the set projects, activities and other initiatives approved by the Steering Committee; 4. Monitor and evaluate the status of all projects, activities and other initiatives vis-à-vis the set targets and objectives in the roadmaps; 5. Conduct meetings to discuss issues and concerns involving their respective project core team and submit report and recommendations to the Steering Committee for their deliberation and policy recommendations, and; 6. Connect with the Center for Excellence in the academe, research and development, policy, promotion and capability building for the implementation of various programs, projects, policies and activities

Monitoring and Evaluation

Monitoring will be primarily led by the Philippine Council for Agriculture and Fisheries (PCAF). The industry will be monitored based on the targets being set, the expenditures being invested and most importantly, if the industry is achieving the technical parameters that they set.