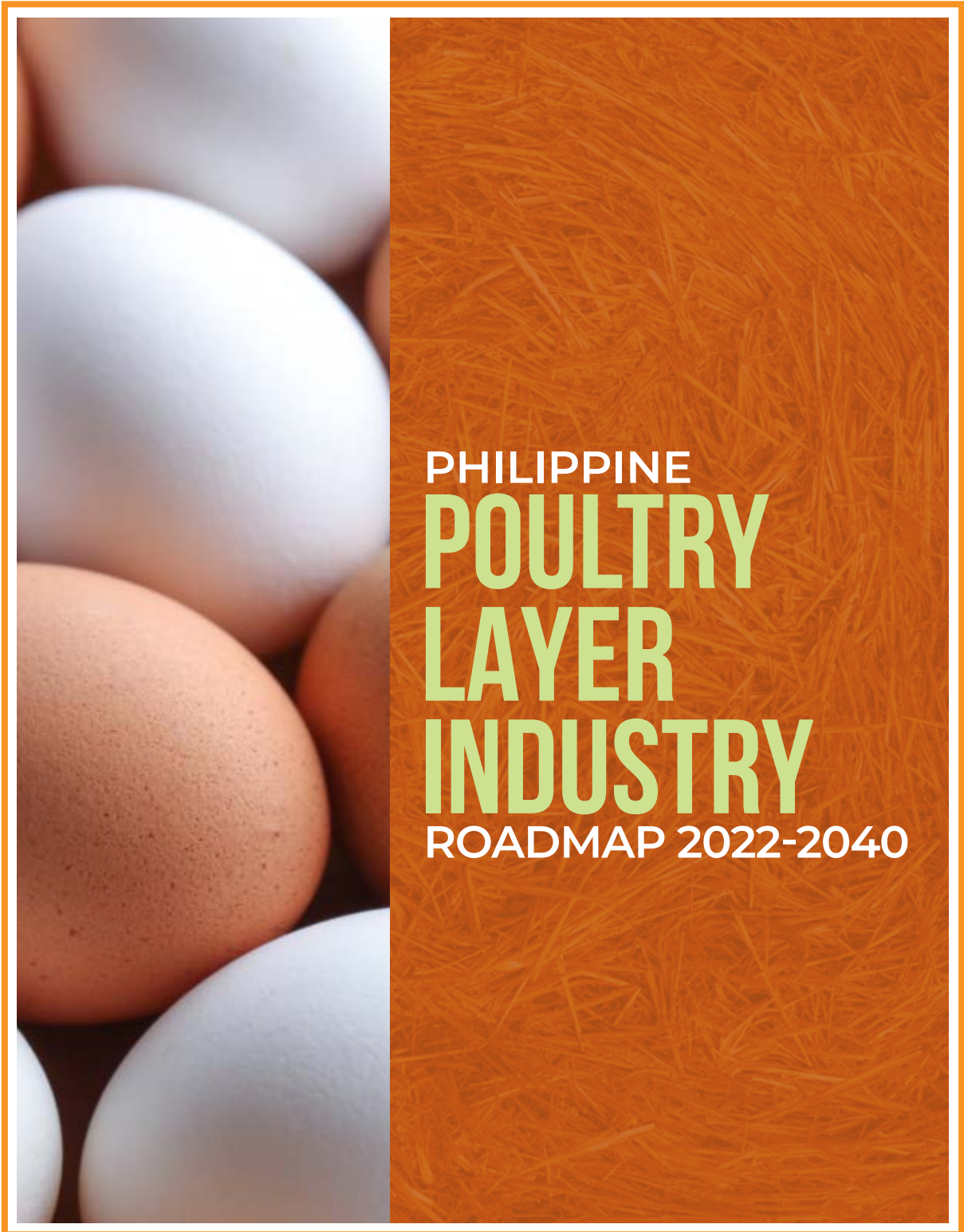




PHILIPPINE
**POULTRY
LAYER
INDUSTRY**
ROADMAP 2022-2040





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**POULTRY
LAYER
INDUSTRY**
ROADMAP 2022-2040



Department of Agriculture
BUREAU OF ANIMAL INDUSTRY

The Philippine Poultry Layer Industry Roadmap (2022-2040)

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MESSAGE

My warmest greetings and congratulations to the working group of Layer Industry Roadmap.

I applaud the whole team who worked so hard to develop our Commodity Industry Roadmap on Layer. This is a good reminder to reminisce the humble beginnings of the industry as well as the impact that it has contributed to the lives of the Filipinos.

The chicken egg sector in the Philippines has been consistently contributing positively to the economy. It is a relatively minor industry compared to broiler chicken. Egg production in the Philippines mainly serves the domestic market. Thus, no export of eggs takes place. The country used to import eggs in shells until the mid-1990s. Today, most of the imports are in processed form-dried egg yolk and powdered eggs-which are preferred and used by bakers, food manufacturers, and the food service industry.

Undernutrition is and has always been, a serious problem in the Philippines. Nutritionally and economically, the egg has always been unbeatable. Now is the perfect time to promote eggs as an affordable, nutritious, and low impact food source. The Layer Industry Roadmap aims to increase the national egg consumption per capita: 150 by 2023; 200 by 2030 and 300 by 2040. It also seeks the inclusion of eggs in the Zero Hunger and Poverty Alleviation Program.

May this document serve the purpose of imparting knowledge and more importantly promoting the ideas for continuing the development of our egg industry. This Egg Roadmap will map out the various aspects of the Eggcosystem to ensure that the Philippine egg industry can and will continue to provide superior value to the stakeholders, harness diverse set of capabilities and innovation to the solution, and quick response to changes and challenges during Covid 19 pandemic and beyond.

My congratulations again and thank you for sharing with us the document that you have worked so hard in order for it to be refined. Let us continue working together for the development of the layer industry!

More Power, Mabuhay and May God Bless Us All!

A handwritten signature in black ink, appearing to read 'Ces G. Dar'.

WILLIAM D. DAR, Ph.D.

**Secretary
Department of Agriculture**



FOREWORD

Looking into the global and local scenarios, it is evident that the poultry industry has been successful in obtaining and maintaining its spot among the top contributors to positive economic development. It comprises several thriving sectors, one of which is the chicken egg sector.

Zooming into the Philippine context, the chicken egg sector has been consistent in providing substantial contributions to the country's economy; albeit considered a relatively minor sector compared to the chicken broiler sector. Nevertheless, it is worth noting that the chicken egg can have a significant contribution to efforts directed at poverty reduction and combating undernutrition, a long withstanding problem that exists in the country. Chicken eggs are affordable, possess high nutritional value, and are a good low impact food source.

However, it was no walk in the park, the sector may be self sufficient but it is not yet as indomitable as other more established industries. The chicken egg sector faced various challenges like the Avian influenza in 2017, compounded with rising input costs and long periods of egg glut. Then again, hurdles are not meant to remain hurdles, only surpassed.

Through conscious efforts for continued innovation, intensive research and smart investments, and the continued synergy among stakeholders, the chicken egg sector emerged and remained to be among the top gainers in the past decade. These efforts allowed the increase in the value of goods and drove the cost of local food production and reaching key markets.

Now with the creation of the Layer Industry Roadmap, we look forward to increasing the national egg consumption and having eggs included and recognized as significant to the Zero Hunger and Poverty Alleviation Program.

A handwritten signature in black ink, appearing to read 'W. Medrano'.

WILLIAM C. MEDRANO, Ph.D.

**Undersecretary for Livestock
Department of Agriculture**



PREFACE

The Philippines Egg Industry Plan 365 aims to make eggs part of the daily life of the Filipinos.

It is a big goal that the roadmap proposes to boost the industry , convert challenges into opportunities , and welcome disruption.

We believe that Egg is a solution. Our vision : Eggs nourishing every Filipino. Egg Industry leading to a healthier Philippines and better food system will pave the way to achieve good nutrition, a foundation for economic prosperity.

We formally declared and laid down our plan for the future, but we have been taking deliberate actions to to make the egg industry competitive. We launched the #LodiAngItlog Campaign, which aims to strengthen the egg consumption throughout the nation to fight Protein Malnutrition. We collaborate and work with the Inter-Agency Task Force on Zero Hunger , various national and local government units, associations, and organizations to achieve the goals and objectives that we have detailed out in the 5 Roadmap Pillars.

We are optimistic that the industry and agriculture in general is already on a journey of growth. However, optimism and bold ideas alone won't get us to achieve our 365 mission. The real fuel needed for this journey is teamwork.

We're calling on the Philippine Government to play a central role in this Roadmap, by stepping up with a National Strategy for Agriculture that commits respective agencies and local government units to a clear growth agenda. It should allow the private sector to grow, community to prosper , and provide a level playing field to protect capital and mitigate the risks associated to agriculture in general.

We will continue to resource the research and advocacy needed to move this agenda forward.

We recognize that the Roadmap will be a dynamic guide, able to re-routed and revised as needed. It will also form the basis of periodic review – holding us all to account for our progress.

BEPCO , PABLI , PCPP and partners have affixed their commitment. We are all hopeful to get started.

We hope you'll join us on the journey!

CECILE ALDUEZA VIRTUCIO, Pabli/BEPCO

Team Leader

Poultry Layer Industry Roadmap Development Team"



EXECUTIVE SUMMARY

Egg Roadmap to a Healthier and Better Philippines by 2040

From the industry early beginnings in 1960s, its strengthening and development in key production centers that serve the growing urban and peri-urban areas, and its collaborative approach to keep up with times and overcome various challenges, the Philippine chicken egg industry has grown. It has met the four criteria under global food security index - i.e. available, affordable, safe and resilient.

Growth is led by private sector and through the appropriate support of various government agencies, it can achieve its aspiration of nourishing 110 million Filipinos, fight Protein Malnutrition , and achieve its aspirations under the 5 Roadmap Pillars: 1.Customers and Industry Value 2.Growing Sustainably, 3.Unlocking Innovation, 4.Capable People and Vibrant Communities and 5. Capital and Risk Management.



INTRODUCTION

Rationale/Background

The Philippines is self sufficient on eggs but is vulnerable. This Roadmap aims to identify feasible, scalable, and innovative solutions to accelerate the egg industry stakeholders' actions under the 5 Pillars to meet its aspirations and objectives:

Pillar I: Customer and Industry Value

Egg is a solution to achieve Zero Hunger. Filipinos are the biggest gainers in a decade of smart investment in the food system infrastructure, which has increased the value of goods and driven down the cost of local food production and reaching key markets.

Filipinos eat eggs everyday. Egg Industry leads to a healthier Philippines and a better food system.

Pillar II: Growing Sustainably

Small holder or Backyard operations are for self-consumption and for selling something extra as a family income. Small and scavenging flocks controlled by cooperatives, villagers and families are prevalent in rural areas, where they contribute to poverty alleviation and food security.

Commercial Egg Farms are intended to feed millions of population in the urban , peri urban and high demand areas. However, as larger production farms become more common, siting issues regarding biosecurity will have an impact on small-scale village and family flocks, possibly leading to conflict if proper management practices are not exercised. The sustainability and potential expansion of any poultry production or processing operation are affected by its location, especially in the long term. This is particularly true of operations located near urban or peri-urban areas. These factors demand careful planning of the location and siting of poultry production units. Failure to take such planning considerations into account when constructing new and larger facilities may result in costly changes or management expenditures in the future.

Enable a **closed loop layer farming model** and ensure the compatibility of practices in the egg industry with environmental standards.

Pillar III: Unlocking Innovation.

The populations that will suffer the most from the increase in food prices are the poor people across the world. Reasons for this are, among others, that “lower income consumers spend a larger share of their income on food [and] bulk commodities account for a larger share of food expenditure in low income families”. Egg is a solution. Let’s start maximize the value of eggs by extracting its nutraceutical and functional elements, extending its shelf life, and value addition of its by-products

Continuous learning to improve productivity and maximize shareholders’ benefits through backward and horizontal integration to meet local and global competitiveness

Pillar IV: Capable People and Vibrant Communities

Working in Egg Industry may it be in primary (production) secondary (manufacturing) and tertiary (services) is recognised as a rewarding and aspirational career choice for people of all skill levels and backgrounds. We attract and develop people to match the needs of our sector and we adapt to the shifting needs of the future. They are leaders, critical thinkers, technical experts, those who work with their hands and more. Our reputation for workplace excellence attracts phenomenal human talent from the Philippines and around the globe.

Strengthen the economy by promoting enterprise development and by **increasing stakeholders’ income and community benefits**

Pillar V: Capital & Risk Management

Egg enterprises have become increasingly sophisticated in their approach to governance, risk management and planning for the future. Every farm has a clear strategy for managing the inherent risks of farming, including an expanded role for insurance, and business models which share production risks along the value chain. Commercial layer enterprises are investment- ready.

Create a **data driven enterprise** model that will support chicken eggs to continuously meet the 4 global food and nutrition security index i.e affordable, available, safe, and resource resilient

Egg roadmap is a collaboration of ideas from the private and public sector including those documented in the earlier papers collated by the Department of Agriculture. It considered the current situation, trends and vulnerabilities as presented in the Foresight Document of the Department of Science and Technology PAGTANAW 2050. It follows the national development goals and aspiration in AMBISYON 2040 and its 2021 update. The roadmap looked back on how the egg industry stakeholders leverage on the urbanization and economic transformation, addressed the challenges and implement solutions and how it can execute within the Department of Agriculture New Thinking Framework and the United Nations Sustainable Development Goals to transform Philippines food system in general and grow a vibrant and sustainable egg industry.



INDUSTRY SITUATION AND OUTLOOK

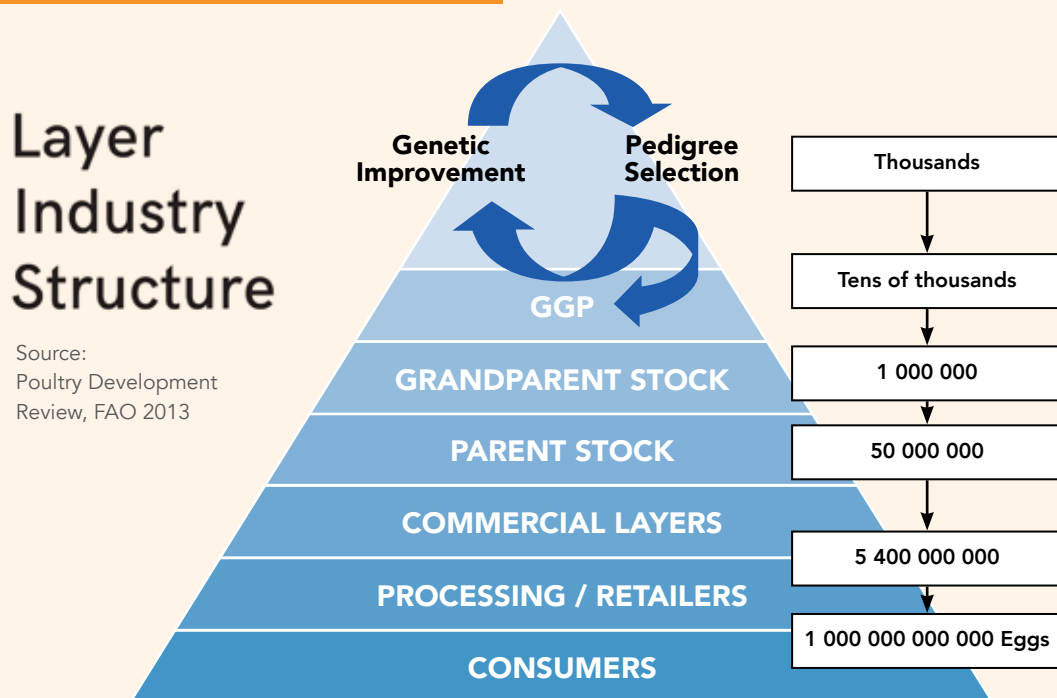
Industry Structure

The poultry industries are a diverse mix of birds species farmed in countries throughout the world. Primarily raised for meat or eggs, the domesticated species can include but are not restricted to chickens, ducks, turkeys, geese, quail, and guinea fowl. The focus of this roadmap is the commercial chicken layer industry.

Structure of the Chicken Industry (Egg and Meat)

The structure of the chicken meat and egg industries is very similar. Grandparent flocks incorporate the latest genetic development/advances and produce parent birds. These flocks are located on dedicated farms and are managed on an all in all out basis. The breeder flocks are also run as all in all out farms again on separate dedicated farms. The slaughter generation birds in the case of broilers or the replacement pullets are then placed with contract growers or sold to commercial egg laying farms. Broiler farms are also run on an all in all out basis whereas a majority of the commercial egg layers are multiage production systems.

FIGURE 1. PHILIPPINE LAYER INDUSTRY STRUCTURE



BREEDS - Imported Parent Stock or Hatching Eggs

Source: PABLI

Bovans White Dekalb Brown Dekalb white H & N Nick H & N Super Nick H&N Black H&N Brown Nick	Hisex white Hy line Hy-Line Brown Hy-line Pink Hy-Line White Isa White	Lohman LSL LSL Extra Shaver Brown Shaver White
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FARM DEFINITION

Source: Philippine Statistics Authority

Any poultry farm household, whether farming or non-farming, tending at least one to 250 birds	SEMI - COMMERCIAL 250-5000 layers and basically use commercial feeds	INDEPENDENT 5001 and above birds and use external and internal feeds (own feed formulation).	INTEGRATOR Large and multi location operations Normally managed by corporations and maintain all or more functions in the value chain
--	--	--	---

MARKET & CHANNELS

Hotel Restaurants & Institutions	Household Retailers - Wet Market, Supermarket, Groceries and Sarisari store Wholesalers
--	--

Layer Farm Definition

The Philippine Statistics Authority defines the structure of the layer farms as backyard and commercial farms.

Backyard farm refers to any poultry farm household, whether farming or non-farming, tending at least one up to 250 birds. On the other hand, the definition of commercial farm is divided into three sub-groups. These are: semi-commercial, independent and integrator commercial farms.

Semi-commercial farms are those with less than 5,000 layers. These farms basically use commercial feeds. Layer houses are open-sided and may likely be made from wood and bamboo or cage type stand alone system. Generally, semi-commercial farms may have business permits or barangay registration. It may not have complete farm records, BAI registrations and Environmental Compliance Certificates (ECCs). There is minimal monitoring on labor standards.

Independent commercial farms operate between 5,001 and above birds and use external and internal feeds (own feed formulation). Layer houses are either conventional open-sided like small-scale farms or semi-automated, that is made of steel, elevated and open-sided. These farms have business permits and farm records. Some secure ECCs and comply with labor standards.

Layer Integrator farms are normally managed by corporations and maintain more than 80,000 layer birds. These companies have their own feed mills and house layers in steel, elevated and open sided houses with many large players in tunnel ventilated closed houses. These farms are administered with farm records, business permits, and ECC and comply with labor standards

Market & Channels

FIGURE 2. MARKET & CHANNELS



Small holder or EggBackyard operations are for self-consumption and for selling something extra in the community as a family income.

Commercial farms table eggs are sold to community in wholesale and / or retail . Viajeros or Department of Trade and Industry registered traders who have applied for transport carrier license with the Department of Agriculture, These viajeros commonly distribute to wet markets and egg users in the food processing , food service , hotels and restaurant sectors. Big wholesale buyers are egg traders with large warehouses in key demand centers and facilitate the distribution to institutional and retail segment.

Product Forms

Philippines is predominantly a white egg country. Brown eggs have been introduced in the Philippine market around 2015 and is marketed as cage free, free range and organic.

FIGURE 3. EGG PRODUCT FORMS



Fresh Eggs are sold in trays of 30, 12's , 10's, 6's , 4.s and per piece in the retail stores. Branding and product differentiation are now common in supermarkets .

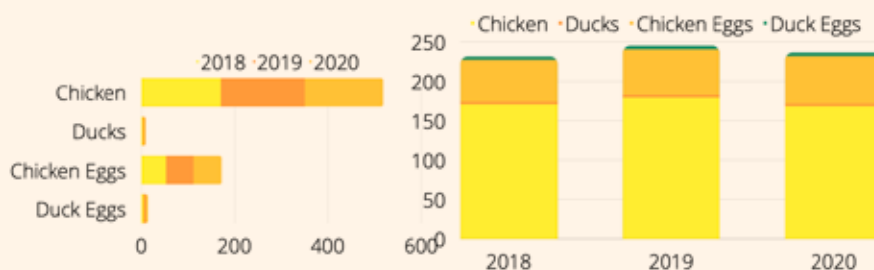
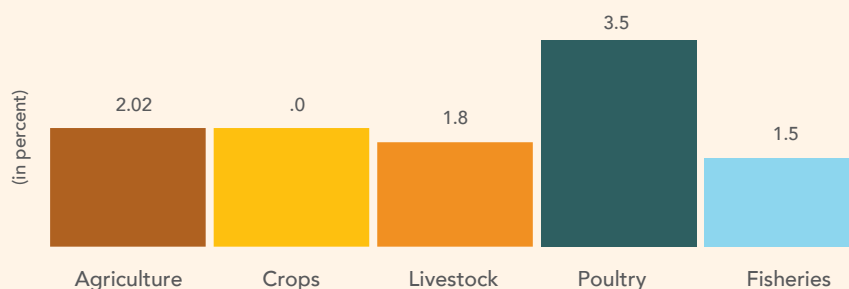
Egg products are generally sold to institutional and select retail outlet. These egg products commonly undergoes pasteurization process for food safety.

Performance and Outlook

Poultry (meat and egg) is the most progressive animal enterprise in the Philippines today with average growth rate of 3.5% at 2018 constant price. Chicken contributes 12.2% and chicken eggs 3.3% of the country's output (i.e. gross value added) as per Philippine Statistics Authority [PSA], 2017. The growth has been carried out up to 2019 and for eggs even up to 2022.

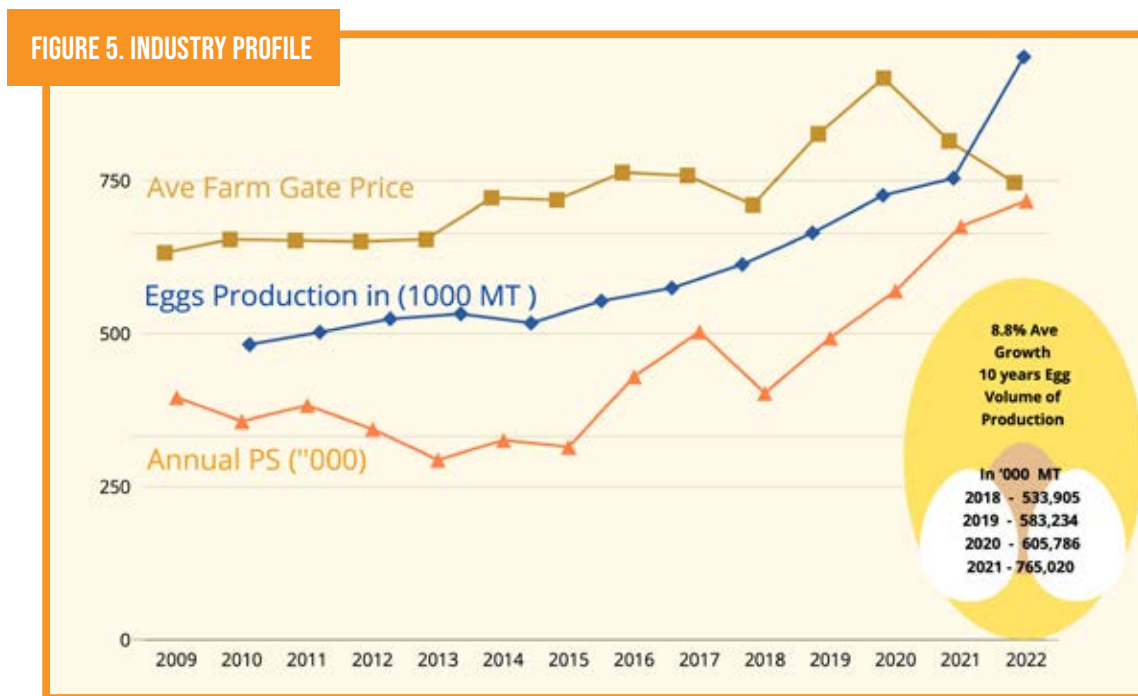
Relative to swine and broiler, egg industry is small with value of Php60.54Bio as of December 2020. , the egg industry The global turmoil that has been brought up by COVID19 pandemic.

FIGURE 4. AVERAGE GROWTH RATES OF VALUE OF PRODUCTION AT CONSTANT PRICES FROM 2000 TO 2019.



Production

The level of annual arrival of the Layer Breeder Parent Stock (PS) is the biggest determinant of the commercial egg production and the layer population. With PS arrivals breaching 400K levels starting 2016 and 500K in 2017 which was tapered by the Avian Influenza (AI) incident, commercial eggs production has been growing and 765K Metric tons, all time high level, achieved in 2021 with 10.8% average growth from 2018 to 2021. Growth is further expected in 2022 with forecast arrival of breaching 700K as PS importers grew to 24 players.



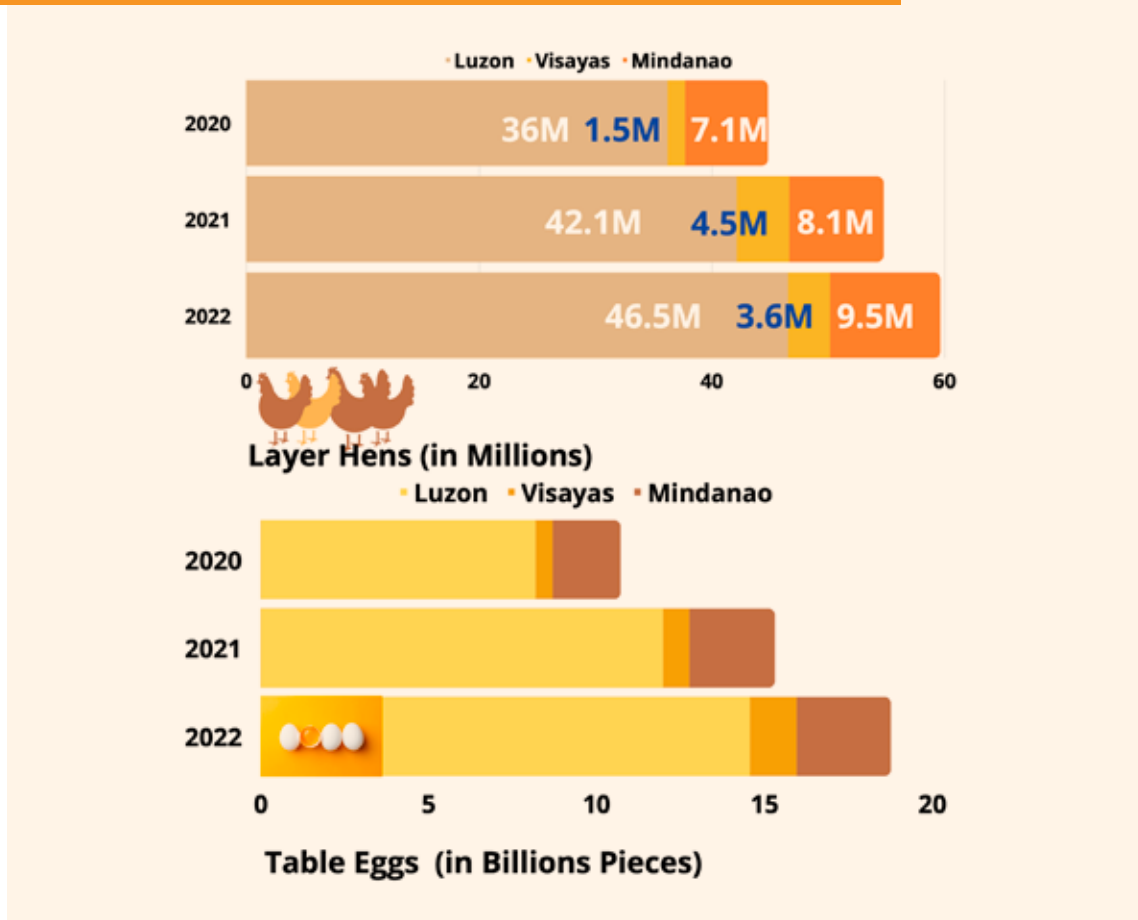
Source PSA , PCPP, PABLI, Deltaman

Inventory, Life Cycle Model and Spatial Distribution (AREA)

Forecast Production is based on PS Numbers as of December 31, 2021 made by Bureau of Animal Industry (BAI). As of December 2021, the preliminary estimated number of commercial layers in 2022 is 56.97M birds while table eggs will balloon to 18.76 Bio pieces. An expected increase of table eggs by 3.4B pieces is 22% Year on Year growth.

Luzon dominates supply with 80% of the commercial layers and table eggs. Mindanao and Visayas with 15-19% and 3-8% respectively. Breeders are mostly located in North Luzon but new PS importers with aggressive expansion in South Luzon, Mindanao and Visayas resulted to growth. Also, shift from swine to layers in view of African Swine Fever fueled growth in layer industry.

FIGURE 6. FORECAST PRODUCTION BASED ON PS NUMBERS AS OF DECEMBER 31, 2021 MADE BY BUREAU OF ANIMAL INDUSTRY (BAI).



Regional Profile

Commercial egg production is intended for feeding the growing population and is commonly near the urban, peri-urban and high demand centers. The country's key production regions are Region 4A Calabarzon (35.7%) led by San Jose, Batangas and Region 3 Central Luzon (20.2%) led by Pampanga. These two regions cater to its own requirements, National Capital Region (NCR) and nearby key centers. Northern Mindanao (9.3%), Central Visayas (7.7%) and Davao Region (4.9%) are growing to cater to the Metro Cebu , CDO and Davao.

Apart from NCR, the following regions are net consumers of eggs: Cordillera Administrative Region (CAR) , Region 1 - Ilocos, Region 2 - Cagayan, Region 5- Bicol, Region 6 - Western Visayas, Region 8 - Eastern Visayas and Bangsamoro Administrative Region (BARM). Movement via inter-island shipping from Luzon to VisMin and within VisMin is common for eggs, chicks , ready to lays and related products.

FIGURE 7. REGIONAL EGG PRODUCTION PROFILE

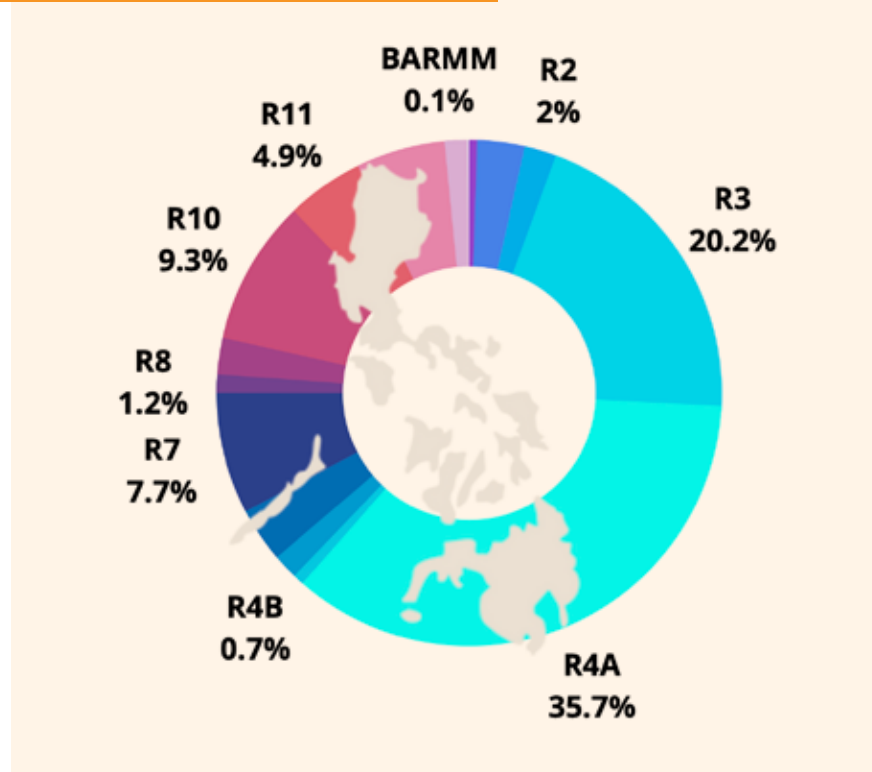
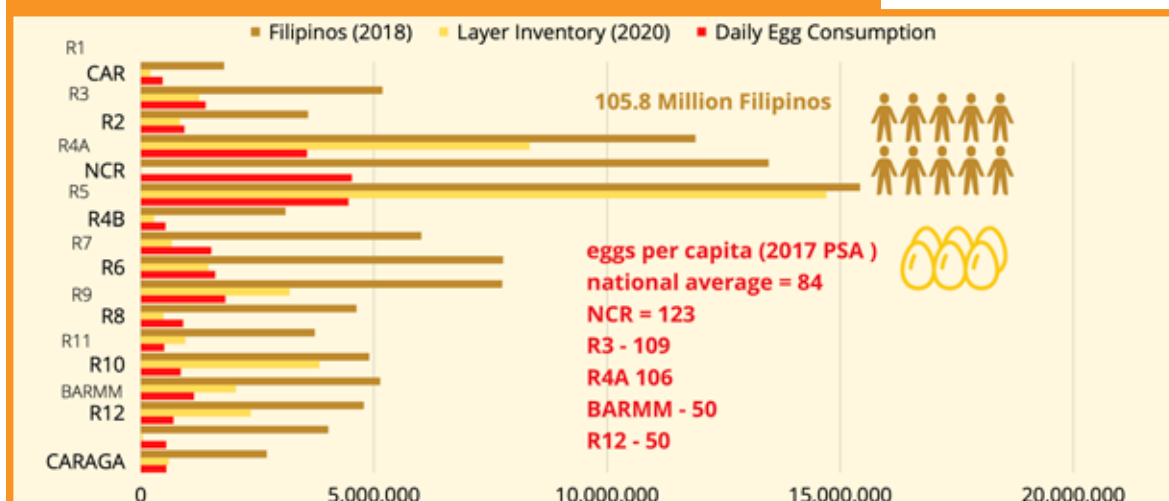


FIGURE 8. REGIONAL POPULATION, INVENTORY AND CONSUMPTION PROFILE



Source PSA , PCPP, PABLI

Consumption per Capita

PSA February 2017 Consumption of Selected Agricultural Commodities Report, showed annual consumption of chicken eggs per person averaged 84 pieces at the national level. Across the reference months, the weekly consumption of chicken eggs remained at about 2 pieces per person. NCR has the highest with 123, Region 3 and 4A with 109 and 106 . See Table in Regional Profile .

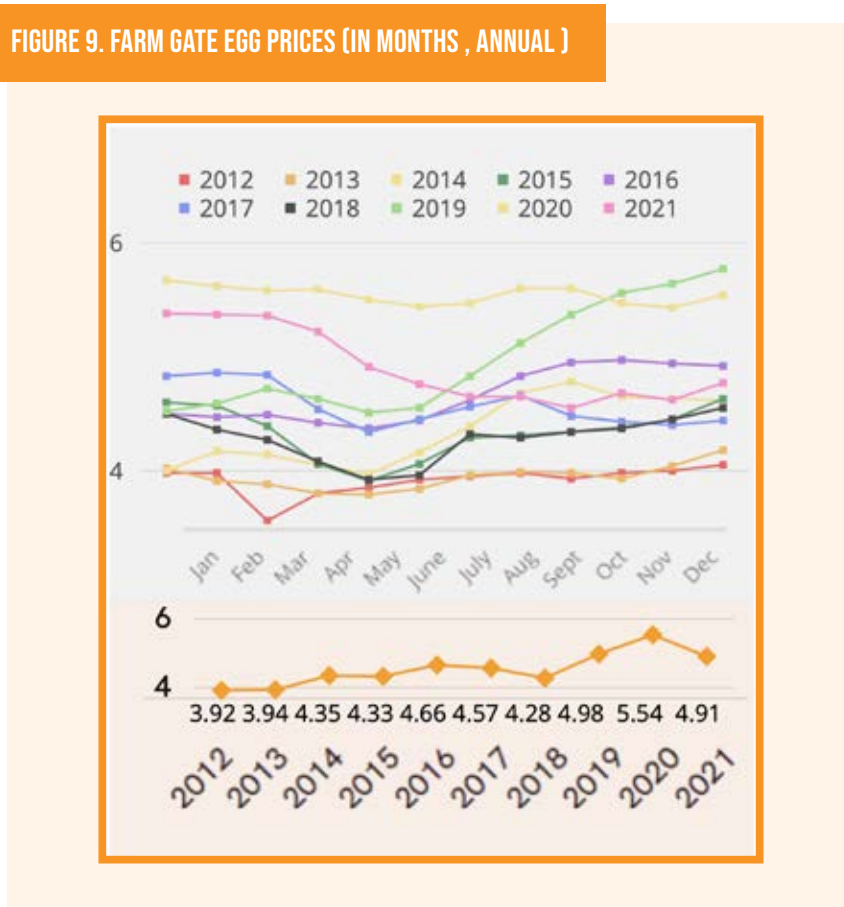
In the same report, it has stated that the average per capita consumption of pork, chicken meat and eggs consistently increased with more working members of the households. From 6.02 kilograms of pork in households with less than 20 percent working members, it peaked at 16.72 kilograms among households with 80 to 100 percent working members. Likewise, these households with the most working members ate the biggest quantity of chicken meat at 13.93 kilograms per person and chicken eggs at about 119 pieces per person.

For 2018 to 2021 Industry estimated growth on consumption per capita to about 150 eggs. In 2020 egg consumption in NCR was estimated to have reached 13.74 kilos or 229 pieces as eggs are the most affordable and available protein food that can be served during lockdowns.

Prices, Supply and Demand

Historically, average Farm gate prices of egg hovered below P4.0 until 2013. Increase of about 30 centavos for 2014 and 2016 or 8% in each 2 year could be attributed to growth of economy in various sector led by services or Business Process Outsourcing (BPO) translated to higher demand of eggs. Price has significant increased in this period as production has also declined. PS level has slowed down due concerns on bird flu in the country of source. Egg production in key areas of Luzon and Visayas were badly affected by super strong typhoons Yolanda and Glenda in 2013 and 2014 causing significant declined in over-all country production.

FIGURE 9. FARM GATE EGG PRICES (IN MONTHS , ANNUAL)



In 2015 and 2016 supply and demand growth are aligned and thus price has stayed in P4.5 to P4.6 per piece level (See Figure 5).

In terms of seasonality, price of eggs used to follow a pattern where it is at its lowest during summer (March to May) due to slower demand in view of school break coupled by higher production in farms due to more stable weather condition. With the implementation of the new

school calendar that started in 2014 the pattern has moved by a month starting 2015. Prices are also seen to pick up in Quarter 3 as this period is the most challenging in terms of supply as the typhoons affects the production of eggs. It also has impact on regional prices due to break in transport mobility from mainland Luzon to inter-island demand centers. Demand in 3rd and 4th quarter are driven by household, food manufacturers and food service.

In August 2017 the Philippines has reported its first Avian Influenza outbreak. In this incident, public scare has dampened the demand for poultry driving down prices significantly. It has also tested the system in terms of transport of poultry and poultry products following inter province or regional borders. Around 4th Quarter of 2017 and in 2018 price of eggs was heavily driven down to below production cost level especially in Luzon. This over supply brought down the level of PS arrival in 2018. The impact of the cut in the breeder was a temporary shortage scenario in 2019. The price of eggs had picked up mid 2019 to its highest level in 2020. In this period, expansion is driven by attractive prices and swine industry shifting to layers in view of African Swine Fever (ASF) pandemic. The government has also implemented egg machine projects as an alternative livelihood to ASF affected farmers. This plus private investment has driven growth in the layer industry. 2nd Quarter of 2021 up to 2022, the accelerated production growth with diminishing household demand and Hotel , Restaurant and Food service industry not picking up resulted to excess supply scenario.

ANALYSIS OF THE PHILIPPINES CHICKEN EGG INDUSTRY

Context and Approach

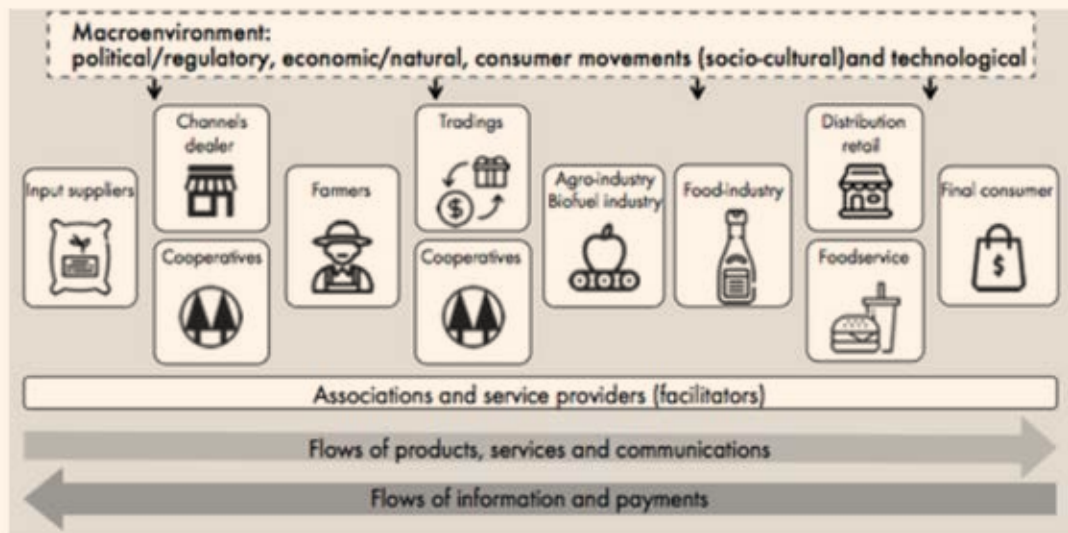
“Eggcosystem” Approach

The Egg Road Map considered the Agribusiness systems, chains, clusters, and networks surrounding the Egg as a product. The analysis covers the entire value chain such as inputs, production, processing, and market under a sustainability framework following an ecosystem approach. As an industry, the ecosystem approach has been implemented by the Batangas egg producers as a response to the challenges brought in by the 2017 Avian Influenza. To define the Egg Ecosystem (“Eggcosystem”), it is the network of organizations – including suppliers, distributors, consumers, competitors, government agencies and so on – involved in the delivery of “egg” as a product and a service through both competition and cooperation. While each enterprise has maintained its independent business model, collectively, the stakeholders worked together to ensure that the common good for the industry like biosecurity protection, education, sustainability solutions and similar needs are met. Each entity or agent recognizes the impact to each other in the ecosystem. Thus, the Eggcosystem approach have reshaped the egg industry.

Egg Roadmap will further leverage on the Egcosystem approach to harmonize and prepare the industry for continued growth. It will consider how the world is facing an astonishing number of changes resulting from one of the worst pandemics ever. Food, agribusiness, and biofuel chains will be working in a new macro environment are all operating differently. The structural changes come on top of the need to increase food production to feed 110 million Filipinos in 2050 and the urgency to increase renewable sources of energy to promote sustainability, save resources and limit climate change.

As to the trends and perspective, PAGTANAW 2050 serve as base assumption from Philippines point of view. For tools and global scanning Food and Agribusiness in 2030 : a roadmap by Marcos Fava Neves. Neves' ChainPlan method (Framework) is used to assist the egg industry stakeholders for strategic planning of food chains in the new scenario, to understand what will happen with chain participants, where markets will grow, how consumers will behave, how sustainability will gain importance, and how cooperatives, associations and other forms of collective actions will gather force to support inclusive growth and meet the industry objectives under the 5 Roadmap Pillars.

FIGURE 10. AGENTS OF FOOD , AGRIBUSINESS , AND BIOFUEL CHAIN



Source : Food and Agribusiness in 2030 : A Roadmap

Agro-industrial systems or chains reveal the flows of products, services, communications, payments and information throughout the production or transformation process of a certain agri-product (food, biofuel, fibre or other), starting with the supply of the necessary inputs for its production until its distribution to the final consumer (Neves, 2014b). Thus, the chains of food, biofuels and other agri-products are formed by agents that play specific roles, following a logical sequential order of activities and processes, in order to guarantee the flow to the final link, the consumer.

The agents that compose an agri-food chain are described in Figure 10, so we can find each one of them, their respective positions, as well as the flows that are performed by each one of them. It is important to take into account that not all the chains will have all of these agents in their configuration, because some intermediaries can be excluded. The Value Chain Map will focus on the egg industry activities and agents. An Analysis of each agent and comparative scan are also presented.

Meanwhile, all agents that make up the food, agribusiness and biofuels chains are exposed to macro-environmental factors that can directly affect their businesses. These factors are classified into four major categories: the political-legal environment, the socio-cultural environment, the economic-natural environment and the technological environment. The list and how it will impact the egg industry are elaborated in Market Trends and Prospect section.

The Participants of the Food Chain

Customers - The consumer is the sovereign agent of the food, biofuel and other agri-product chains, and is also the centre of convergence of the entire process. Efforts of members of the chains will be in vain or wasted if the consumer does not see value in that offer, and this can dismantle and disrupt the entire chain.

Retail - The retailer is the great connecting link between the food industries and the final consumer, being responsible for making products available on their shelves so that consumers can make decisions about which products they will take home.

Food Service - The food service sector covers the food market, with the preparation of meals or snacks outside the home, including restaurants, cafeterias, bars, bakeries, food

machines and others that aim to bring convenience to buyers. The strategies for these businesses to access final consumers involve both physical structures, such as physical stores, drive-thru and take-home systems, and delivery structures, which have increased their scope and representativeness in business with the advent of delivery apps

Food Industry - The food and beverage industries are responsible for processing the raw material, converting it into the final product that will be distributed to consumers, consisting of the link between farmers/trading companies/ cooperatives to the wholesale/ retail sector. These industries need to present a strong brand image to ensure their competitiveness on retail shelves and in consumers' memories.

Biofuel Industry - The biofuel industries are responsible for the production of fuels using vegetable products and/or other fermentable biological waste. They have a fundamental role to play in the decarbonisation of the global energy matrix, due to their potential to replace fossil fuels. The main products of this segment are ethanol, which can be produced from sugar cane, beets and starch grains; biodiesel produced from animal fat or plant oil of species such as soybean, palm, sunflower, babassu and peanuts; and biomethane, a gaseous product obtained through the processing of biogas, the latter being formed by the anaerobic digestion of organic material (agricultural waste, animal manure, domestic sewage and solid urban waste) (ANP, 2020).

Associations - Associations are the only agent that do not position themselves sequentially in the food, agribusiness and biofuels chains, precisely because they can participate in practically the entire process. They are non-profit organisations that represent the collective interests of their members, usually farmers, ahead of other agents in the value chain. Serves important economic function such as the provision of collective goods, minimisation of transaction costs for members, changes in the structure of institutions and development.

Input Suppliers - Input Suppliers are appointed as the first agents in the food, agribusiness and biofuel chains. The main function of these agents is to provide technologies and inputs that enable and improve the production process along the chain, with farmers and agricultural production as the main targets for their solutions. Most of these organisations are positioned to supply products and technologies in the following

segments: crop protection (biological or chemical origin), fertilisers, seeds and seedlings, agricultural machines and implements, among others.

Distributors (dealers) - Distributors or resellers represent the organisations involved in the process of making productive inputs and services available (mainly agronomic and financial) to farmers (Coughlan et al., 2002). They represent the link between the suppliers of inputs and the farmers, since the former do not have the physical and commercial capacity to assist all sizes of farms in a specific region. In this way, the role of distributors comes into play, as by having local operations, they can make products and services available, with huge importance in pulverised markets.

Farmers - Agricultural producers or workers. Agricultural production is a relatively complex activity and requires knowledge of technical, market, environmental and human resource factors (Zylbersztajn & Neves, 2000). Traditionally, farmers are supported by different professionals and agents to meet their demands, but this has changed constantly, especially with the arrival of new generations, more likely to adopt digital technologies to monitor their business.

Trading Companies - Trading companies usually present a more complex business model, covering different links in the agri-food chains, but with the core business oriented for the origination and commercialisation of grains, either in the domestic market or for exports and imports, often being the link between farmers and industries of food, biofuels and other bio-products. The vast majority of them adopted verticalization strategies in the agricultural chains, having businesses in the supply of inputs, distribution of inputs, agricultural production, transportation, storage and processing of grains, food industry or even consumer brands. It is also common for these companies to act as shareholders in businesses related to the production of bioenergy and biofuels

Cooperatives - Agricultural cooperatives are organizations formed by farmers whose main objective is to provide services and products that enable and support agricultural production. Most of them are created by a group of farmers interested in stimulating their crop production or agricultural activity, and tend to attract an unlimited number of members interested in the benefits that it offers.

Source : Food and Agribusiness in 2030 : A Roadmap

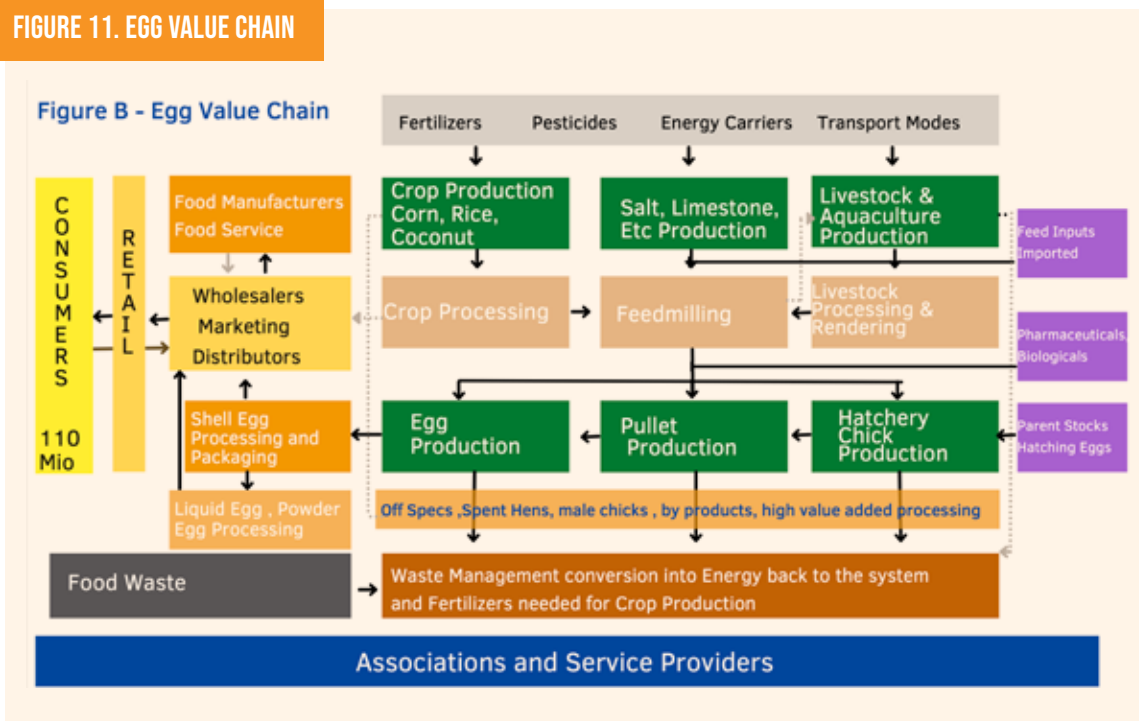
TABLE 1. ROLES/FUNCTIONS, CHARACTERISTICS, AND PROFILES OF THE PARTICIPANTS OF THE FOOD CHAIN

Agent	Role / Function	Global Characteristic	Egg Industry Profile
Input Supplier - 1st agent of food agribusiness , and biofuel chain.	Provide technology and inputs that enable and improve production process	Concentration of technology and patents in hands of few organizations, intensified with the constant mergers and acquisitions	Feeds - 350+ diverse and integrated , many big players DOC & RTL - expanding new players and new areas Biologics - global players and new entrants
Distributors (dealers) or resellers – link between the suppliers of inputs and farmers.	Have local operations and can make products and services available.	Diversified business to include solution package offers, and exchange and financing mechanism.	Large Farms or Groups - direct contract with Supplier. Many Local distributors and technicians / stores
Farmers – agriculture producers	Active role in production process, constant adoption to technologies , with expected environment defender	Wide spectrum , from traditional farmers, agriculture companies of different sizes with diverse strategies	Competitive Industry with many medium to large commercial layers farms.
Cooperative – organizations formed by farmers	Provide technologies, capital, training, and other resources to its members. Act as channel for outflow and consolidates the smallholders to compete with large players	Many cooperatives have verticalized their activities and transformed into agro- industries. Such can expand areas and portfolio of products and services.	Egg Innovation Hub in Batangas Cooperative. Marketing Coop inPampanga Egg Production farms owned by various cooperatives
Trading Companies – present in more complex business model with core business oriented for the origination and commercialization of grains	Largely operate at global level and has a high brand presence . Cargill , Bunge	Vast majority adopted verticalization strategies in the agricultural chains, having businesses in all aspect of the value chain.	Present in Feedmilling supplier. Unlike in broiler, no known egg production project lead by global trading companies.
Food industry - food and beverage company	Responsible processing the raw material, converting it into the final product for consumers. Need to present strong brand image	Most need to monitor and pay attention to consumer trends and behavior. Pressured by distributors, whose negotiating power has increased due to high degree of consolidation and collective procurement.	Integrated companies like San Miguel, Universal Robina Corp, and recently Rebisco has own egg production, grains processing
Biofuel Industry – Ethanol, biodiesel, biogas	Responsible for the production of fuels using vegetable products and/ or other fermentable biological waste.	May require specialized chain. Mandate for decarbonization but faces challenge the argument that they can cause lack of food supply in certain regions.	Low adoption at the moment. Waste is converted into organic soil ameliorant. Large Farms have set up biogas for own energy

Agent	Role / Function	Global Characteristic	Egg Industry Profile
Retail	Responsible for making products available to final consumers. It may be physical stores, drive thru, delivery or pick up service.	Concentration of retail players in modern trade. Consolidation and integrating digital solutions	Growing Conveniences Stores & Sarisari stores carrying eggs. Branded Eggs and House brand in more modern trade
Food Service	Businesses which aims to access to final consumers. Includes physical stores, drive thru, take home systems, and delivery structure	Has incorporated technology to improve the consumer experience. Trend : Influencer & Gourmetisation	Access Egg and egg products thru retail or wholesaler. Niche or gourmet egg users buy directly from farmers
Customers	Center of convergence of the entire process	the main source of information and focus on communication and	Potential to increasing demand and expand consumption of eggs beyond breakfast.

Value Chain Map - Egg Industry

FIGURE 11. EGG VALUE CHAIN



With a vision of Eggs nourishing 110 million Filipinos everyday, the industry value chain should put the consumers at the forefront. The industry should look on how it can make eggs part of everyday life of the Filipinos. Figure 11 broadly shows the egg industry activities and components or value chain. The Roadmap Pillar cover certain key activities in the value chain or sets of additional activities to strengthen the value chain :

Roadmap Pillar 1

Customers & Industry Value

- Consumers (Communication covering nutrition and wellness , consumer rights and protection, food safety standards, and fair pricing mechanism)
- Retailing (access, availability, retail channels)
- Marketing , Wholesale and Distribution (market development, logistics, wholesale channel)

Roadmap Pillar 2

Growing Sustainably

- Production & Feed Milling
- Value Added Processing
- Waste Management & Circular Economy
- Master Planning

Roadmap Pillar 3

Unlocking Innovation

- Product Innovation, By Products and High Value Product Development
- Capacity Building, Human Network to promote new practices and appropriate tools (backyard, small to medium commercial farms and agri- enterprise)

Roadmap Pillar 4

Capable People & Vibrant Communities

- Education and Job Upgrading
- Enterprise Development

Roadmap Pillar 5

Capital & Risk Management

- Information and Data Management
- Corporate Governance and Leadership
- Investment Incentives and Protection

The next section is a summary of the current players, characteristics, facts and trends, of the various Agents of the Philippine Chicken Egg Network or “Eggcosystem” with focus on linkages of the egg industry to the various local agri-enterprise and commodities.

SWOT Analysis (per VC Segment)

Inputs Supplier

Feeds and Feedmills

Philippine feed milling, an intermediate operation supporting the livestock, poultry, and aqua industries, produced a total volume of 18.98M metric tons, valued at 510B in 2019, estimated animal feeds for layers was almost 2.5 million metric tons.

The feedmill industry's structure is comprised of (1) commercial producers, who are solely engaged in the feed manufacturing business, (2) integrated farm feed millers, who are engaged in livestock production and at the same time sell feeds commercially, and (3) on-farm feed millers, who produce feeds for their own farms. What used to be an industry led by on-farm feed mixers in the early 1980s is now one of the fastest growing agricultural enterprise dominated by large commercial players.

Philippine Association of Feedmillers Inc. PAFMI is the biggest and oldest group of feed millers in the country with 35 members including Univet Nutrition and Animal Healthcare Company, Pilmico Foods Corp., Universal Robina Corp., Philippine Foremost Milling Company, General Milling Corporation, and Vitarich Corporation.

TABLE 2. SWOT ANALYSIS OF PHILIPPINE FEED MILLING INDUSTRY

Area of Operations	S (Strength)	W (Weakness)	O (Opportunities)	T (Threats)
Feed Milling	Domestic feed milling industry continues to consolidate and modernize, servicing the feed needs of the growing livestock, poultry, and aquaculture industries.	2021, PAFMI said that the feed milling industry will continue to experience a decline in feed demand due to the continuous outbreak of ASF, high importation of pork and poultry products, government restrictions on the importation of feeds, banning of the cockfighting operations nationwide, and a lower purchasing power brought about by unemployment and recession and scaling down of consumers' cheaper protein source.	Contract Growing Arrangement for Feed Inputs Development of Alternative Feed Inputs	Very High feed input cost and unavailable raw materials due to breakdown in logistics New Players and influx of imported feeds

Feed Inputs

The common feed ingredients used in the Philippines include corn, rice bran, copra meal, feed-wheat, cassava, soybean meal, fishmeal, coconut oil, salt, and assorted vitamins and minerals. Focus is given on locally sourced feed inputs especially Yellow Corn. As a major component of layer feeds, yellow corn price, supply and value chain directly impact the egg industry. As these two sectors are highly interrelated, Egg Roadmap has put in the local corn sector as part of circular economy.

TABLE 3. SOURCE AND CHARACTERISTICS OF FEED INPUTS

Feed Input	Source	Characteristics
Yellow Corn	Local, ASEAN, United States	<ul style="list-style-type: none"> > Yellow dent corn is the variety is the preferred feed-grain by local end-users. However, quality issues (i.e., aflatoxin) are commonly associated with locally produced corn, and as a result, most > feed-mills prefer imported corn for its reliability and uniformity. > Traders dominate the marketing and distribution of local corn. > To discourage corn price surges, major feed producers and big farm operations import corn and/or corn substitute such as feed-wheat, distiller grains and cereal by-products.
Soya	United States, Argentina, Brazil	<ul style="list-style-type: none"> > Soya has an excellent amino acid profile that complements that of corn, the primary energy source in poultry diets. > As local production of soy is negligible, almost 100% of soya inputs for feeds are imported. > As Soya and grains are primary commodities export of US to the Philippines, this input is highly impacted by US-China trade relations, tariffs and global logistics and events.
Wheat	Ukraine, Australia US, Europe & China	<ul style="list-style-type: none"> > As a corn substitute together with corn distillers grains, cereal grains and other food industry by products > Feed formulation and animal nutrition is highly impacted by the feed inputs used.
Copra Meal, Coco Oil	Local	<ul style="list-style-type: none"> > Copra production will decline through MY 20/21 as coconut trees take a biological rest period after consecutive years of heavy nut bearing in MY 17/18 and 18/19
Fish Meal	Local, Peru	<ul style="list-style-type: none"> > Poultry diets invariably contained 5 percent fish meal, with early broiler feeds and layer diets having as much 10 percent. What prevented most nutritionists from using even more fish meal in poultry diets was not cost, but its concentration in fish oil.

Source: USDA Foreign Agriculture Statistics, 2020. Oilseeds and Products Annual

Pharmaceuticals, biologicals, organics

Supplies for animal health of the Philippine livestock and poultry industry are dominated by foreign companies. Vaccines, vitamins, medications and other biologicals are imported from countries predominantly from China, India, Europe, and America. Locally developed animal health pharmaceuticals and organics are negligible and these locally developed products have not reached commercial scale yet. They are typically used in small organic farms.

The major chicken diseases, their occurrence, and control are summarized in the Table 4. Diseases can present serious problems, particularly in major growing areas, because of the high chicken population density. Often there are improper or non-existent biosecurity procedures, lack of diagnostic laboratory services (outside some major broiler integrators) and nominal government control. The government provides no veterinary services for farms, no reliable reporting system of disease incidence in chicken farms, and therefore is not in a position to control the spread of diseases. Under this situation, a good farm animal health program is essential.

Philippine Veterinary Drug Association PVDA is the vanguard of ethical industry leadership and professional integrity in the provision of safe veterinary and nutritional products towards food safety and animal welfare. PVDA supports the bill and the intent to streamline the livestock industry, including covering every veterinary drugs as part of the value chain.

Vaccines and medications from major companies such as Meriel, Schering Plough, Intervet, Boehringer, Sanofi, Elanco, Pfizer, Bayer, and Upjohn products, among others, are available.

TABLE 4. COMMON POULTRY DISEASES, OCCURRENCE AND CONTROL

Common Poultry Diseases	Occurrence	Control
Avian Influenza	Not yet endemic in the Philippines; isolated detection associated with free-roaming poultry	Best prevented by bird-proofing housing facilities, or limiting access of poultry to areas frequented with wild migratory birds; No approved vaccine
New Castle Disease	Endemic nationwide affecting commercial and native stocks With breaks observed in young or mature chickens Higher occurrence observed during the rainy season	Primarily vaccination and proper biosecurity implementation
IBD	Endemic nationwide With breaks associated with inadequate cleaning and disinfection, biosecurity lapses and/or improper vaccination including having multi-aged farms	Prevention is primarily by a vaccination regimen during the early life of the chickens This can be done with a vaccine given at day-old and/or a series of vaccines given during the growing ages Breaks generally occur when vaccine strain used does not match the virus challenge in the area, when there is improper administration of the vaccine, or when there is another pathogen causing immunosuppression
Infectious Bronchitis	Cause upper respiratory or reproductive infections that lead to mortality in young or adult chickens, or significant drop in egg production in adult laying chickens followed by observation of eggs with poor shell quality	Prevention is primarily by biosecurity and a vaccination schedule designed according to the level of the virus challenge in the epidemiological area Primarily vaccination and proper biosecurity implementation
Colibacillosis	A usual sequelae to an Mg infection leading to a chronic respiratory disease; May also be detected in other respiratory viral infections as an opportunistic pathogen	Prevention can be achieved with good biosecurity with primary focus on cleanliness and sanitation. Treatment with an antibiotic determined to be effective against the isolated E. coli can be implemented.
Mareks	Endemic nationwide affecting chickens that have not received proper vaccination regimen ievded with the Rispens strain	Prevention with an MD strain suited to the challenge in the epidemiological area, most effectively achieved with the Rispens strain
Fowl Cholera	Endemic nationwide especially observed in flocks grown in facilities with poor sanitation or in those without effective rat control program; commonly observed too in flocks mixed with game fowls	Prevention can be achieved with good biosecurity with primary focus on cleanliness and sanitation. Individual or flock treatment with an antibiotic determined to be effective against the isolated Pasteurella can be implemented. Vaccination of either live or killed or combination of both can be implemented

cont'd ►

Common Poultry Diseases	Occurrence	Control
Coryza	Occurs in young and mature chickens	Prevention can be achieved with vaccination and good biosecurity measures with primary focus on cleanliness and sanitation. Individual or flock treatment with an antibiotic determined to be effective against the isolated Haemophilus can be implemented
Pullorum Disease	Affects birds of all ages but < 4 weeks of age suffer high mortalities. Transmission is vertically and horizontally.	Control measures focus on testing and eradication of the disease
Fowl Typhoid	Transmitted vertically and horizontally	Control measures similar to Pullorum; vaccines are available




SOURCE : PVMA , PCPP











Poultry health challenges

- The implementation of veterinary policy on use of banned drugs and compliance to withdrawal periods is weak due to lack of understanding and appreciation on the effects of non-compliance.
- The introduction of avian influenza last 2017 (and the recurrence in 2020 and 2022) disrupted production and movement of poultry.
- Disease surveillance in the country is inadequate, especially the reporting and feedback mechanism.

Layer Breeder Companies

Below are some information about global and local layer breeders or integrators obtained from company websites or social media accounts.

Global Companies for GPS layer breeders	
	<p>Founded in 1936, Hy-Line International was the first of the modern layer genetics companies to incorporate hybridization and the explosive potential of hybrid vigor into its breeding program on a commercial scale and to use it alongside time tested methods of genetic selection coupled with scientific statistical analysis to develop and improve one of the world's most extensive gene pools.</p> <p>Hy-Line geneticists, more than eight decades ago, developed the world's first hybrid egg laying chicken produced on a commercial scale and through the decades have maintained and improved the genetic product through the use of time tested breeding techniques in combination with blood typing and other new genetic innovations to guarantee ongoing genetic superiority and consistency - bird to bird, variety to variety, generation to generation</p>
	<p>Pioneering spirit and decisiveness, tradition and progress: the dynamic path from "Deutsche Fischmehl GmbH" to LOHMANN BREEDERS GmbH, the global market leader for layer parent stock.</p> <p>Which came first – the chicken or the egg? LOHMANN has always and will always focus on both: the chicken and the egg. The success story of layer breeding in Cuxhaven began in 1959</p> <p>Success story FOR EVERY MARKET THE RIGHT EGG</p> <p>Anybody who wants to produce eggs needs laying hens – and of course only healthy and efficient ones. Therefore, LOHMANN began very early to concentrate on these characteristics in their selection programs. Consumers, however, wanted more to choose from: Some people preferred white eggs, others brown eggs, some wanted large eggs, others smaller eggs.</p>
	<p>Hendrix Genetics: A multi-species animal breeding, genetics and technology company. One of the world's leading laying hen breeders and distributors of white and brown layers. Offers a regional approach for each market by providing six different layer brands.</p> <p>Hendrix Genetics is passionate about animal breeding. We have breeding programs in turkeys, layers, guinea fowl, swine, salmon and trout. Looks for innovative, sustainable solutions, together with the entire animal protein value chain. At the start of the chain, we have an influence on the outcome. For example, our responsible use of antibiotics program benefits producers and consumers. For us, better breeding today, means a brighter life tomorrow.</p>

	<p>Bounty Fresh Foods, Inc. (BFFI) and Bounty Agro Ventures, Inc. (BAVI) are companies under the privately-owned Bounty Fresh Group of Companies (BFGC) in the Philippines. The business was established by the Chen family in the 1980s with only 5,000 heads of chicken from a one-layer house in Sta. Maria, Bulacan. Soon, the company progressed and became one of the largest broiler and layer integrators. BFGC is the only fully-integrated poultry firm continuously investing in company-owned facilities which includes GP farms, PS farms, hatcheries, dressing plants, feed mills, and cool-cell broiler complexes in the country. It is also the first firm to employ the single-stage commercial broiler hatchery incubation system (eggs grouped according to development stage and to be incubated together)</p>		<p>Charoen Pokphand (CP) Foods Philippines Corporation, a Charoen Pokphand Foods Public Company Limited subsidiary, operates agro-industrial businesses, which includes animal farming and meat product manufacturing from Thailand and other foreign sources.</p> <p>Established in 2007, the business initially started with shrimp hatchery. It then moved into feed in 2010, swine breeding in 2011 and broiler production in 2012. Today, CP's operations focus on feed, farm, and food businesses. The company manufactures and distributes aquatic feed (shrimp and fish) and animal feed (swine, chicken and duck). Its farm businesses comprise swine, broiler, layer, duck, shrimp, and fish, of which it produces breeders and commercial animals and products, including preliminary processed meats.</p>
	<p>Brookdale Farm is part of Brookside Group of Companies. The company is engaged in Swine & Poultry business for over 38 years. Located at Km. 102, Anupul, Bamban, Tariac, Philippines.</p>		<p>San Miguel Food and Beverage, Inc. (FB), the food division of San Miguel Corporation, is the largest food and beverage firm in the country. Formerly San Miguel Pure Foods Company, Inc., the business which was established in 1956 engages in integrated operations such as poultry and livestock operations-from breeding, contract growing, processing and marketing and manufacturing beverage, coffee and dairy products. The company is diversifying to animal and aquatic feeds and flour milling, among other products.</p>
	<p>Gama Food Corporation, established in 2005, is a fully-integrated poultry operation. Marketing dressed chicken nationwide, Gama Foods has its own dressing and feed mill plant in Cagayan de Oro. The firm has extended offices in Visayas in Mandaue City and Iloilo City.</p>		<p>MASAGANA FARM is a market leader in producing the freshest and highest quality FRESH CHICKEN EGGS to serve the top institutions, markets and consumers in the Philippines.</p>
	<p>Robina Poultry Farm supplies nutritious and superior tasting egg to consumers. We nurture and prioritize the well-being of our chickens to maintain the quality of our products.</p> <p>Robina Poultry Farm is an accredited breeder of prominent poultry genetic breed of layer chickens. We produce commercial day-old pullets, ready-to-lay chicks and fresh commercial table eggs in our cutting-edge fully automated commercial building."</p>		<p>Vista Del Rio Farm is a regional player in Mindanao that supplies dressed Chicken, Eggs, Day-old Broiler Chick, Day-old Pullet (Layer), RTL (Ready-To-Lay), Poultry Equipments & Food Service Products.</p>
	<p>Established in 1990, Coral Agri-Venture Farm Inc. started as a backyard hobby that slowly turned into a full-fledged farm.</p> <p>Apart from crocodile business, Coral Agri-Venture Farm Inc. takes great care in providing the market with the freshest eggs. We ensure that our chickens are healthy and are raised with the best feeds available.</p>		<p>Arca Galleon AgriVentures, Incorporated is involved in the supply and distribution of various goods and services for the Philippine Agricultural industry. The organization functions primarily as the exclusive distributor for some of the agricultural industry's leading global brands whose activities may be broadly categorized as:</p> <ol style="list-style-type: none"> (1) Animal Nutrition; (2) Animal Feed; (3) Animal Health; and (4) Veterinary Products.

Distributors (Link of Farmers to Input Suppliers)

In a chain of food, agribusiness and biofuels, distributors are represented by agricultural input stores, which supply farmers through different channels, such as internal commercial teams, large company resellers, representatives, online channels, among others (Castro and Neves, 2007). Cooperatives and small individual resellers can also play the role of distributor, depending on the characteristics of local production.

Many of these agents have diversified their businesses in recent years, through the creation of different types of solution package offers, and exchange and financing mechanisms. The issue of offering credit has become a key role for distributors, in order to generate liquidity for farmers.

Layer farmers and feedmillers commonly called this group as suppliers. Apart from providing suppliers credit, they also provide technical assistance and usually provide market updates to farmers and its organizations.

Local commercial input suppliers can hire their own sales and technical team while global input suppliers have local distributors. Depending on the business, distribution can be on exclusive or non exclusive basis.

All local agents are required to register with the Bureau of Animal Industry (BAI). The main facts and global trends to distributors are:

- High concentration of players in emerging markets.
- Geographical diversification, working with several agricultural producers.
- Growth in grains origination and trading.
- Growth in credit facilities for farmers.
- Growth in farm management services.
- Growth in own areas and shareholders areas.
- Excellency in relationships and CRM programmes.
- Possible big data managers.
- Coordination of a strong contractual network of service providers.
- Intense competition with trading companies and cooperatives.

- Working with own brands.
- Higher percentage of generic products.
- Higher bargain power with input suppliers.
- Consolidated and known regional and national brands.
- Multinational managerial standards and governance.
- Strong interpersonal relationships.
- Pressure on business margins.
- Rising wave of online sale of inputs through marketplaces or omnichannel.

Farmers

With the growth of the world population and the demand for food and biofuels, concomitant with the request for preserving the environment and adopting sustainable practices, agricultural production has become increasingly efficient in terms of the use of land, resources and inputs. In this sense, farmers have played an even more important and active role within the production process, with the constant search for information, technologies, traceability and professionalization (Cônsoli et al., 2011).

Productivity and innovation is indeed a common trait of layer farmers across all segment. The backyard or cage free or ranging type adopts technologies and organic practices to meet intended market segment. Small, medium and large commercial are constantly looking for ways to maximize profits in operations. This could be a default given that the financial performance of an egg farm is relatively easy to monitor as daily production , expenses and amortizations are easier to compute. Thus egg farmers are quick to make a decision to adjust and take corrective actions to minimize losses.

Egg producers are also entrepreneurial. Selling of eggs at farm or own warehouse is usually complemented by its own delivery or retail outlet. In farm value adding such as freezing cracked eggs or consolidation of by products are being implemented to maximize profit. Used sacks, spent hens, and off specifications eggs are sold off. Egg shells and manure are also being sold off or processed.

Farm workers for large commercial egg companies have qualifications and benefits that are similar to industrial manufacturing company workers. For independent commercial farms, depending on operations size , there can be an in-house farm managers and consultant. Each building will have a dedicated farm worker or caretaker that is in-charge for feeding , egg collection and any other tasks assigned by the farm manager or owner. The farm workers are commonly less education background and are commonly from crop farming migrating to key egg production centers to look for stable income. They applied to egg farms so that the family can reside in a housing facility provided by the farm.

Not much program or information about the egg farm workers. Currently, in San Jose Batangas, Department of Agriculture and LGU are targeting to capture the relevant data and put it in DA registry system.

Cooperatives

Cooperatives have a big role to play in to promote efficiency , productivity and provide competitive advantage to egg farmers in the various stage of the value chain. As a group, egg producers can create a cooperative for their inputs requirements like feedmilling and as distributor for DOPs, RTLs, veterinary supplies and the farm requirements. The cooperative can also market the produce like in Minalin, Pampanga.

As for the case of Batangas, an egg producers cooperative was set up in 2010 to help address the challenge of the egg industry . With the help of DA, Batangas Egg Producers Cooperative (BEPCO) established its liquid egg processing facility in 2012 and it now caters safe, convenient, and economical pasteurized egg products to food services and manufacturing companies.

In 2017, the cooperative partnered with DA and LGU to protect Batangas against bird flu. In 2019, BEPCO received a financial grant from the DA for the establishment of chicken manure automated composting facility which helped cut the cooperative members' dependence on expensive and high-risk fertilizers.

In August 2020 Secretary Dar toured the egg processing facility of BEPCO which showcases the benefits of farm consolidation and industrialization by value-adding, processing, manufacturing, and developing markets for their poultry products.

“This egg processing facility is such a noble enterprise, which was initiated by the private sector with the help of the Department of Agriculture (DA). Piloting or incubation was done and poultry farmers were consolidated. These are the principles or strategies that are being institutionalized and scaled up in the DA.” Secretary Dar said in a news article. <https://www.da.gov.ph/phs-egg-processing-capital-demonstrates-innovation-in-the-value-chain-approach/>

BEPCO is now a partner of various government agencies as an Egg Innovation Hub and is a shared service facility for the egg industry. Together with other agriculture cooperatives, these agents can help execute One DA Aspirations following the below global trends:

- Professional management, strong governance.
- Concentration and internationalisation
- towards agribusiness
- countries.
- Buying and selling alliances (joint ventures).
- Demand-driven vision and activities.
- Increased inter-cooperation.
- Increased data collection and sharing.
- Cooperatives with own brands.
- Constant technological development.
- Bring agriculture 4.0 to small and medium
- farmers.
- Credit as source of competitive advantage.
- Credit cooperatives gaining more and more space in the rural
- credit market.
- Very visible by parts of society.
- Part will focus on consumer goods and own brands with national

- presence competing in food markets.
- Owners of supermarkets and other retail formats.
- Coordinator of a collection of services offered by a contractual network of suppliers.
- Transparency.
- Origin identity appreciation.
- Vertical integration of businesses.
- Greater dissemination of knowledge to members through digital platforms.
- Adoption of technologies and sharing of service costs.

Source : Food And Agribusiness In 2030 : A Roadmap

Food Industry

The food and beverage industries are being affected by changes in consumption habits, which have created new niche markets (vegetarians, vegans, flexitarians), have generated acceptance of alternative ingredients and demand for healthier and traceable products; on the other hand, they have increased pressure on their suppliers to offer more quality, reliability and traceability. It is also important to note that the sector has also been pressured by distributors, whose negotiating power has increased due to the high degree of consolidation and collective purchasing groups. In addition, retailers are adopting strategies to reduce inventory and prioritize products with more margin and turnover. As a result, industries have less shelf space for product displays, making slotting fees more expensive, and less warehouse space, increasing complexity and logistics costs (Neves et al., 2015).

- More concentration/consolidation of players.
- Global competitors × local and specialised companies.
- Squeezed by retailers buying power and buying groups.
- Strong sustainability package, from ecological packages, use of by-products, water consumption, carbon emissions.
- Diversification/merging with other industries (nutraceuticals and nutricosmetics).
- Trend for nutrition and consumer experience.

- Channels optimisation (gate-to-gate and others).
- Strong cost control over all processes.
- Attractive to the youth and global talents.
- Space for gourmet, premium and hand-made products.
- Circular economy and chain integration (by-products).
- Alternative sources of ingredients (plant-based, meat substitutes, insects, algae, hemp and others).
- Small brands empowerment.
- 4.0 Industry.
- Growth of niche products (to vegetarian, allergics and other groups with dietary restrictions).
- Growth in the supply of superfoods (with high level of proteins, mineral, etc).

Source : Food And Agribusiness In 2030 : A Roadmap

Retail (Buying in bulk from farmers / Viajeros / Trader)

There has been a slowdown in the opening of new physical stores around the world, with steeper declines in developed markets. In addition, the average revenue per square meter of these stores has also been decreasing and will continue to decrease in the coming years, due to the loss of space for alternative channels (Planet Retail, 2017). Thus, online commerce has gained the trust of consumers, supplying much of the new needs and trends such as convenience and time optimization.

The modernization of the Philippine retail sector continues its acceleration under COVID-19 restrictions, which have greatly shifted consumer buying habits to choose upscale vendors and online solutions. Despite shortages in supply caused by sea and land freight issues, retail sales are expected to remain strong.(USDA FAS - Food Service - Hotel Restaurant Institutional Report Sept 2021)

Fresh products such as eggs in packs are now part of e-commerce. Traditional channel such as wet market, groceries , and sari sari stores are filled up by viajeros or traders or by farm owned delivery vehicles. Physical warehouse and distribution channels have defined the extent of advantage of the traders. In scenario of excess supply, traders are

also taking profit as it can provide immediate cash payment versus capital tied up in receivables or farm inventory.

There have been ventures by retail segment owners into egg production and egg producers investing into retail. Blumentritt and Caloocan warehouses are already filled by own farm productions. The shortage of eggs in 2014-15 and industry good performance in past decade had enticed many Chinese retailers to go into layer industry and lesson learned during lean season taught farmers to create its market.

Ultimately the viajeros are also monitoring facts and trends associated with food retailing:

- Professional management, strong governance.
- Concentration and internationalisation towards agribusiness countries.
- Buying and selling alliances (joint ventures).
- Demand-driven vision and activities.
- Increased inter-cooperation.
- Increased data collection and sharing.
- Cooperatives with own brands.
- Constant technological development.
- Bring agriculture 4.0 to small and medium farmers.
- Credit as source of competitive advantage.
- Credit cooperatives gaining more and more space in the rural credit market.
- Very visible by parts of society.
- Part will focus on consumer goods and own brands with national presence competing in food markets.
- Owners of supermarkets and other retail formats.
- Coordinator of a collection of services offered by a contractual network of suppliers.
- Transparency.
- Origin identity appreciation.
- Vertical integration of businesses.
- Greater dissemination of knowledge to members through digital platforms.
- Adoption of technologies and sharing of service costs.

Food Service

Like retail, the food service sector has incorporated technology to improve the consumer experience, whether through apps and delivery sites or even digitising menus, automation and service robotisation, among others.

Philippine food service sector to shrink by a further 13 percent to \$7.4 billion in 2021, following its 44 percent decline in 2020. With the spread of the Delta variant of COVID-19, people are hesitant to return to restaurants. Recent lockdown measures to contain the pandemic have triggered further losses on on- premises sales. Most food service providers remaining in operation have shifted to online delivery platforms and curbside pickups. Larger chain restaurants have made inroads by selling ready-to-cook meals at retail stores. (USDA FAS - Food Service - Hotel Restaurant Institutional Report Sept 2021)

What else is going on regarding food service?

- ‘Gourmetisation’ and dishes signed by influencers.
- ‘On the go’ concepts for restaurants, events, food machines and kiosks.
- Function robotization and automation.
- New online channels for delivering.
- Physical stores with embedded technology.

Consumers

In recent years, we have been witnessing a big revolution in terms of consumer behavior in several sectors. It is no different for the food and beverage industry. Consumers are becoming increasingly aware and concerned about issues related to the environment, health and quality of life. On the other hand, innovation and technology allow for easy access to information, connections and new experiences. All of these factors have contributed to transforming people’s perceptions, habits and behavior in relation to food and beverage consumption. In that sense, this material provides an overview of trends and opportunities in food and beverage marketing for the coming years. (Chapter 4 : Food and Agribusiness in 2030 : A Roadmap)

TABLE 5. 20 TOP TRENDS, OPPORTUNITIES AND ARGUMENTS FOR FOOD MARKETING

20 top trends, opportunities and arguments for food marketing	Description	Authors related
1. Adventurer consumer	Consumers want to explore products, try exotic ingredients and have great experiences related to taste, avour and ambiance. As traditional products do not catch their attention, products must stimulate the discovery of senses.	Angus & Westbrook (2019); Brecic et al. (2017).
2. Diversification of ingredients sources (plant-based, meat substitutes, insects, algae, hemp and others), 'direct from nature' arguments	With the growth of niche markets, such as vegans and vegetarians, and concerns about meat production due to animal welfare, gas emissions and use of resources, alternative ingredients are gaining space in order to substitute or complement diets. Plant-based hamburgers and sausages, and insect-based foods are examples that can already be found in some supermarkets.	Brecic et al. (2017); Hedin (2019); McCarthy et al. (2016).
3. Green products movement, 'footprint' (reduce waste and pollution), animal welfare and free-range, and sustainable suppliers	Sustainability, animal and environmental care are important decision criteria for consumers, embracing the idea of guaranteeing resources and food for future generations. We observe an appreciation for certi cations related to sustainable production, respect for the environment and 'humanised' breeding.	De-Magistris et al. (2017); Giampietri et al. (2015); Hedin (2019); Mascaraque (2019); McCarthy et al. (2016); Woo & Kim (2018).
4. Healthy snacks and food 'on the go'	Due to a busy routine, time is limited, and people have less time for meals, needing convenience without giving up on healthiness. So, vegetable snacks, nuts, dry fruits and small portions of juices are becoming important to meet this demand. Also, the food must be consumer-driven, facilitating access and even the buying process, through technologies that reduce the time spent in store queues.	Angus & Westbrook (2019); De- Magistris et al. (2017); McCarthy et al. (2016).
5. Attention to diets (feel good, healthy, well-being, nutrition, bres, protein, collagen). Emergence of the exitarians (partial reduction of intakes)	Consumers are paying attention to the number of calories and the nutritional value of what they eat or drink. High- bre products are becoming important due to their functional properties. Also, feeling good through food habits is synonymous with vitality, mainly associated with lifestyle.	Angus & Westbrook (2019); Asioli et al. (2017); De-Magistris et al. (2017); McCarthy et al. (2016).

cont'd ►

20 top trends, opportunities and arguments for food marketing	Description	Authors related
6. Smallholder brands and promotion of inclusion and job creation. Social responsibility of companies	Brands with social appeal are also gaining importance for consumers, because they offer a quality of life to those involved in the process and generate opportunities, creating value for social aspects of groups and communities.	Giampietri et al. (2015); Hedin (2019); Mascaraque (2019); Woo & Kim (2018).
7. Consumer connected to the plate (digital, more knowledge of foods and ingredients and transparency)	As technology advances, consumers have more access to information about what they eat or drink. The agri-food chains are becoming more transparent and, with blockchain and IoT (Internet of Things), all kinds of food information will be available on the consumer's smartphone, such as where the products came from, what inputs were used to produce them, how they were transported, among other relevant information.	Hedin (2019); Kumar & Kapoor (2017); Regattieri et al. (2007).
8. Products free of ... (lactose, gluten, sugar, etc.) and other dietary restrictions	Due to food intolerances and restrictions, products free of lactose, sugar, gluten and others are gaining space on supermarkets shelves.	Asioli et al. (2017); Hedin (2019); McCarthy et al. (2016).
9. Indulgence – 'my gift'	Many consumers use food as a reward when they have accomplished a task.	Batat et al. (2018); Belk (1975); Boniface (2016).
10. Flavours and sensory aspects (textures, smell, colours), knowledge about food ingredient characteristics	For some kinds of new consumers, the complete experience comes from combining the sensory aspects – colour, texture, flavour, smell and sometimes the ambiance.	Batat et al. (2018); Belk (1975); Brecic et al. (2017); Jaeger et al. (2017).
11. Origin of products, ingredients and traceability (for security and knowledge)	Consumers are becoming increasingly concerned about food and beverage origin and how they were produced. Knowing exactly where they come from and how they arrived on the supermarket shelf generates greater trust and relationship. Blockchain allowing better tracing.	Manning (2016); Manning et al. (2007); Planet Retail (2017).
12. Authenticity and simplicity	The 'more is less' philosophy has also arrived in the food and beverage market. Cleaner brands, simple packages and simple products fit this philosophy.	Belk (1975); Kumar & Kapoor (2017); Youn & Kim (2017).
13. Family and tradition	Approaching the consumer through company history and tradition, promoting a family spirit, increasing empathy and security. 'From my family to yours'.	Belk (1975); Kumar & Kapoor (2017); Manning (2016); Manning et al. (2007).

cont'd ►

20 top trends, opportunities and arguments for food marketing	Description	Authors related
14. Buy local, made locally and 'direct from farms' argument	In the reverse wave of the globalisation of markets, some consumers are migrating to the 'buy local and made locally' philosophy, which brings with it appreciation and pride of local products. 'Appreciating our community'.	Adams & Salois (2010); Belk (1975); Kumar & Kapoor (2017).
15. Gourmet, premium and hand-made (artisanal) products	Gourmet, premium, hand-made are products with a higher standard, proclaiming a more elaborate cuisine to consumers willing to pay for the best.	Angus & Westbrook (2019); Heide & Olsen (2018); Youn & Kim (2017).
16. Desire for storytelling, sharing information among users and the role of food influencers	In today's economy, consumers share their experiences, which are valued by other users. Also, consumers become more engaged if they know the story behind the product/brand and identify with it. Growing importance of influencers on social media.	Mossberg & Eide (2017); Planet Retail (2017); Zhao & Zhang (2017).
17. Make your own products or foods (cooking experience)	Inclination to make their own products or foods with mixtures of different ingredient origins.	Angus & Westbrook (2019); Heide & Olsen (2018).
18. Propensity to buy bulk and concentrated products	In order to reduce packaging and plastic use, consumers are valuing bulk and concentrated products.	Giampietri et al. (2015); Hedin (2019); Mascaraque (2019); Woo & Kim (2018).
19. Longer living – practicality, small portions	The number of people living alone has grown dramatically in recent years. This market demands practical products and small individual portions for a one-person meal or snack.	Angus & Westbrook (2019); Belk (1975).
20. Pleasure of logging out (joy of missing out – JOMO)	Consumers are valuing their disconnect moments so as to devote more time to their hobbies and pleasures.	Angus & Westbrook (2019); McCarthy et al. (2016).

Source : Food And Agribusiness In 2030 : A Roadmap

Philippine Association of Layer Breeders Inc. (PABLI) has commissioned a tracking study in 2019 and 2021 on the egg consumption pattern of the Filipinos. The market research called Project Alder has the following conclusion :

- There is already an increase in egg consumption. Use of eggs in different meals is becoming a habit a Negative beliefs towards eggs have decreased but can still be worked on.
- Significantly more regular egg eaters believe that eggs are staple food at home and using it as ingredient makes a dish better. While negative effect on health for eating eggs daily is more believed by non-regular egg eaters
- Benefits of eating egg need more push as it is left to be the barriers as to why certain segments remain to have unchanged or minimally changed habits.

FIGURE 12. FOUR CLUSTERS FOUND AMONG EGG EATERS BASED ON THEIR CONSIDERATIONS AND BELIEFS.

	CLUSTER 1	CLUSTER 2	CLUSTER 3	CLUSTER 4
KEYWORDS FOR CLUSTER NAMING	EGG-conomical and H-EGG-lthy Benefits-Driven	EGG-citing/EGG-thusiast Eggs Enthusiast	EGG-fortless Convenience-Driven	V-EGG-ilant Controlled Consumption
CLUSTER SIZE (% relative to total market)	30.40%	26.00%	13.20%	30.40%
CLUSTER DESCRIPTION For each cluster, considerations and beliefs in egg consumption could be summarized as follows:	<i>'affordable, convenient, and healthy'</i> For this group, eggs are generally healthy, so eggs become a handy option when they want to eat something nutritious that is affordable and easy to prepare. Nevertheless, their considerations when choosing eggs are basic - size, shell quality, and vitamin content.	<i>'staple, many benefits, fun to prepare, should be chosen thoroughly'</i> Aside from the recognized health benefits of eating eggs and using it in recipes and other purposes, this group is the most particular about the quality of eggs they are using. Since they tend to consume eggs more frequently, they have it as a staple ingredient at home and find preparing them as a fun activity.	<i>'convenient but not healthy'</i> This group resorts to consuming eggs because it is convenient and fast to prepare. Nevertheless, many of them believe that eating eggs daily is bad for their health. They don't have much consideration in choosing eggs.	<i>'healthy but not for the old and ill'</i> Like cluster 1, this group believes that eggs are healthy, however, they stand-out in their belief that there are segments which should consume it with caution (esp. the older segment and those with heart-related ailments). The cluster has basic considerations when choosing eggs - size, quality of shells, vitamin-enriched.

The study also shown four clusters among egg eaters namely Egg-conomical and Healthy, Egg-citing / Egg-thusiast, Eggfortless, and V-Egg-ilant where benefits, quality, convenience, and control on consumption are the considerations and beliefs. For benefit-driven egg eaters, their core belief is that eggs are healthy and affordable. For the second group, they believe that eggs are essential and fun to prepare. While for convenience-driven, they believe that egg dishes are easy to learn and prepare. The last group believes as well that eggs are healthy but must be consumed with caution.

These Filipino consumers and beliefs are to be considered in drafting the specific action plans for this Egg Roadmap.

Associations

In agribusiness, the associations have an important economic function such as the provision of collective goods, minimisation of transaction costs for members, changes in the structure of institutions for the benefit of their associates, economies of scale, conflict resolution, defense of members' interests, the role of coordinator between companies, and representation and communication (Castro et al., 2015; Nassar, 2001; Saes, 2000). Moreover, the associations are linked directly to the increase in productivity and efficiency of the associates (Neves et al., 2017).

In recent years, agricultural associations have occupied an increasingly broad space in the government spheres, actively participating in discussions and positioning themselves as essential agents in supporting public authorities for the development of sector policies. For this reason, associations should gain even more space in the coming years, and it is necessary to pay attention to some essential points to ensure that they achieve the final goal.

Below are the main trends for these agents:

- Increasing participation in well-managed associations, cooperatives, syndicates and others (collective actions).
- Clashes of interest between farmers and industry.
- Increase in transparency of chain information.
- Increased efforts among companies to improve the visibility of sectors.
- Increased importance in promoting and transferring technology.
- Important role in training farmers.
- Coordinator of sustainability among farmers.
- Search for modern public policies for agribusiness. Coordinators of partnerships and initiatives involving different links in the agro-industrial system.

The following are lead private sector organizations for the egg industry :

	<p>Philippine Association of Breeder Layers Inc. (PABLI) is the core group of breeders and layers farm with an advocacy to promote and deliver excellence in the Philippine Egg Industry through service, education and leadership.</p>
	<p>The Philippine College of Poultry Practitioners, Inc. (PCPP) is an organization of poultry veterinarians that advocate the professional advancement of its members and is committed to the upliftment of the Philippine poultry industry.</p>
	<p>Philippine Veterinary Medical Association (PVMA) is the sounding board of the Filipino Veterinarian.</p>
	<p>National Federation of Egg Producers of the Phils. (NFEPP). The Philippine Egg Board is an organization of egg farmers all over the Philippines with a total of 14 local chapters from Luzon, Visayas and Mindanao. The organization represents a combined layer population of 15 million birds nationwide.</p>
	<p>BEPCO is a social enterprise that acts as egg innovation hub, develops shared service facilities, provides continuous education and improvement for sustainability and community development. VISION: Unifying the agritech industry to meet the global needs to nourish families and consumers</p>

Income / Cost & Return Analysis

Income and Profit Analysis obtained from Value Chain Analysis prepared by DA 4A for Chicken Egg.

The Egg Producer

For an individual or company to set up a 10,000-layer farm, it would require at least Php 7.5 Million capital wherein 45% of which is for housing, cages and equipment, 35% for the poultry stock while the remaining 20% is for the operation cost for one and a half month. Initial capital requirement, 10,000- layer farm contains the details of the initial capital requirement while Technical and financial assumptions, 10,000 layer farm contains other technical assumptions in computing for the cost and returns of chicken egg production.

Based on the Cost and Returns Analysis found in Projected Cost and Return for 10,000 RTLP – (Egg Producer), about 80 % of the Direct Cost is spent on feeds while the next highest expense is the replacement pullets that are being replaced every two years. Other expenses include biologics which is estimated to be 3% of feed cost, and a laborer for the whole farm. Operating expenses include repairs and maintenance, depreciation, utilities and land rental. For the returns, aside from income from sale of eggs, the feed bags, manure and culled layers can be sold too.

On an average, about 80% of the pullets are expected to lay eggs 42 weeks in a year. With the heavy investment cost in putting up the business, the cost of money should be factored in representing quite a chunk on the expected profit from the business. In the Cost and Return table, the interest was factored in for a 70% initial capital loan payable for 6 years at 8% interest rate.

TABLE 6. COST AND RETURN ANALYSIS (70% CAPITAL PAYABLE FOR 6 YEARS AT 8% INTEREST RATE)

ITEM	AMOUNT (PhP)
1. Housing, cages, and equipment cost	3,500,000.00
2. Ready to lay Pullets (Php 270 each)	2,700,000.00
3. Working capital requirement (1.5 months)	1,461,700.00
Feeds (110 grams per day @ Php 20 / kg)	990,000.00
Biologics (3%)	29,700.00
Laborer (Php 7,000/mo.)	10,500.00
Utilities	1,500.00
Contingencies	430,000.00
Total	7,661,700.00

(SOURCE: FGD, KIL, 2018)

In the Cost and Return table, the interest was factored in for a 70% initial capital loan payable for 6 years at 8% interest rate

P0.48 per egg

Items	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total	Average
Revenues	10,570,740	11,549,040	10,570,740	11,549,040	10,570,740	11,549,040	66,209,340	
Cost of Production	8,403,600	8,694,600	11,174,600	8,694,600	11,174,600	8,778,600	56,870,600	4.03
Interest (for 5.36M loan @ 8% interest, 6 years payable)	479,055.20	479,055.20	479,055.20	479,055.20	479,055.20	479,055.20	2,874,331	
Net Profit after interest	1,688,085	2,425,385	-1,037,915	2,425,385	-1,037,915	2,341,385	6,814,400	0.48
Egg Production per Year	2,352,000	2,352,000	2,352,000	2,352,000	2,352,000	2,352,000	14,112,000	

The average cost per egg was obtained by dividing the total cost of production and net profit with the total egg production for the 6 year period.

ITEM	UNIT	AMOUNT	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Number of Layers	BLP	10,000.00						
Cost of BLP	pesos/BLP	270.00						
Layor mortality (1%/yr)	birds/year	640.00						
Production period of layers	weeks	60.00						
Feed consumption/bird	grams/bird	110.00						
Cost of feed/kg	pesos/kg	20.00						
Biologics medications and supplements	of feed cost	3%						
Utilities	pesos/month	1,500.00						
No. of professional laborers		1.00						
Salary of laborer	pesos/month	7,000.00						
Land rental (6 years)	pesos/year	10,000.00						
Household cages and equipment cost (15 months)	pesos/BLP	350.00						
Life span	years	10.00						
Damage factor	of original cost	20%						
Repairs and maintenance/yr	Year 1-6	1%						
Egg production per day (20%)	eggs/day	4,000.00						
% of broken eggs/day (2.5%)	eggs/day	100.00						
Selling price of egg	pesos/egg	0.10						
Selling price of broken egg	pesos/egg	2.00						
# of empty shell/eggs/week	egg/week	104						
Selling price of shell/eggs	pesos/egg	0.20						
Minimum production (20% of total conversion)	kg/day	270						
Working capital of pullets	pesos/BLP of 1.5 mo	1,461,700.00						
Needs for operating								
Source of Information: Mr. Leo Salazar of KAPIL								

The Trader

Based on FGD, a medium scale trader sells at least 10,500 eggs two to three times per week. Chicken eggs are sold depending on the size of the egg at varying cost. Every delivery, a trader is expected to earn as much as Php 6,448. Costs and Returns of Chicken Egg Trader per week shows the cost and return analysis of a trader of chicken egg in CALABARZON.

TABLE 7. COST AND RETURN ANALYSIS OF CHICKEN EGG TRADER, CALABARZON

ITEMS	Particulars				Amount
	Return	No. of Trays	No of Eggs per Tray	Total No. of Eggs	
Costs					
Cash Costs					
Jumbo	5.00	35	30	1,050	5,250
Extra Large	4.75	50	30	1,500	7,125
Large	4.25	90	30	2,700	11,475
Medium	3.80	90	30	2,700	10,260
Small	3.00	50	30	1,500	4,500
Pullet	2.00	18	30	540	1,080
Peewee	1.50	17	30	510	765
Egg Trays	125.00				125
Straw	80.00				80
Tracking	7,500.00				7,500
Total Cash Cost					40,160
Returns					
Cash Income					
Jumbo	6.25	35	30	1,050	6,563
Extra Large	6.00	50	30	1,500	9,000
Large	5.75	90	30	2,700	15,525
Medium	5.18	90	30	2,700	13,982
Small	4.30	50	30	1,500	6,450
Pullet	3.50	18	30	540	1,890
Peewee	2.50	17	30	510	1,275
Total Cash Income				10,500	54,608
Profit					6,448

Assumptions:

- 30 eggs per tray
- Jumbo 10%
- Extra Large 15%
- Large 25%
- Medium 15%
- Small 5%
- Pullet 5%
- Peewee 5%
- Tracking is inclusive of driver, porter and payment for toll fee.
- No. of Eggs per Delivery 10,500.00

A medium scale trader sells at least 10,500 eggs two to three times per week. Chicken eggs are sold depending on the size of the egg at varying cost. Every delivery, a trader is expected to earn as much as Php 6,448. Costs and Returns of Chicken Egg Trader per week shows the cost and return analysis of a trader of chicken egg in CALABARZON. P0.62 per egg 11% margin

Retailer

The retailers are the ones that sell chicken egg to the consumers. An ordinary retailer can sell 3,000 eggs for 2 to 4 days with an expected income of Php 2,277. Details of their cost, income and profit can be found on Costs and Returns of Chicken Egg Retailer per week and Cost and Return on a Per Egg Basis.

TABLE 8. COST AND RETURN ANALYSIS OF CHICKEN EGG RETAILER

ITEMS		Particulars			Amount (Php)
Costs					
Cash Costs	Cost per Doz	No. of Units	No. of Trays	Total No. of Eggs	
Cost of Eggs					
Jumbo	6.25	10	30	300	1,875
Extra Large	6	10	30	300	1,800
Large	5.66	25	30	750	4,345
Medium	4.5	25	30	750	3,375
Small	4.3	20	30	600	2,580
Pullet	3.5	5	30	150	525
Pewee	2.5	5	30	150	375
Bin (Stall)	50	1		50	50
Packaging Materials	25	1		25	25
Laborer	250	1		250	250
Total Cash Costs					15,200
Returns					
Cash Income					
Sale of Eggs					
Jumbo	7.25	10	30	300	2,175
Extra Large	7	10	30	300	2,100
Large	6.65	25	30	750	4,988
Medium	5.3	25	30	750	3,975
Small	5	20	30	600	3,000
Pullet	4.15	5	30	150	623
Pewee	4.07	5	30	150	611
Total Cash Income		14		3,000	17,477
Profit					2,277

	Total	No. of Eggs	Per Egg Basis
Returns	18,754.00	3,000.00	6.10
Cost	15,477.50	3,000.00	5.16
Profit	2,656.50	3,000.00	0.89

Assumptions:
30 eggs per tray

An ordinary retailer can sell 3,000 eggs for 2 to 4 days with an expected income of Php 2,277. Details of their cost, income and profit can be found on Costs and Returns of Chicken Egg Retailer per week and Cost and Return on a Per Egg Basis.

P0.89 per egg

13% margin

The Processor

According to the processor, the bulk of their cost came from buying raw materials, which is actually 20 eggs for a kilo of liquid pasteurized whole egg, 30 eggs for a kilo of whites and 50 eggs for a kilo of yolk. Based on the table, it was estimated that they can earn Php 11.99 per kilogram of liquid egg produced or an equivalent of Php.60 per piece of egg used as raw material.

TABLE 9. COST AND RETURN ANALYSIS OF CHICKEN EGG PROCESSOR (8% MARGIN)

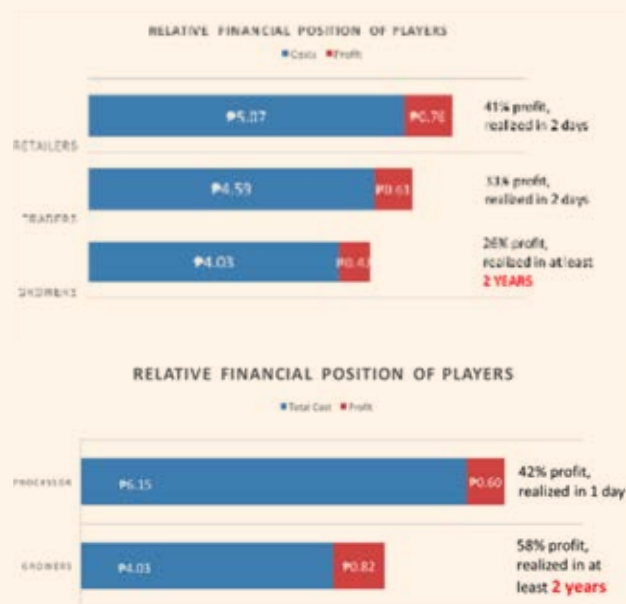
Items		Cost per Kilogram of Liquid Egg	Coast on Per Egg Basis (20 eggs/kilogram)
Cost:	Raw Materials	94.00	4.70
	Other Cost		1.45
	Direct Labor	6.47	0.32
	Depreciation	7.53	0.38
	Utilities	9.91	0.50
	Packaging	5.10	0.26
	Total Cost	123.01	6.15
Returns	Total Returns	135.00	6.75
Profit	Total Profit (PhP)	11.99	0.60

Assumptions: 20 eggs per kilogram of pasteurized whole egg
Cost is based on the data prepared by BEPCO

Relative Financial Position of Players

Two Relative Financial Position of Players were prepared. First is for the Fresh Chicken Egg Production and the other is based on the Liquid Pasteurized Egg Production. Based on the data below, the retailers acquire the highest profit share of 38% followed by the farmer at 35% then the trader at 35%. Meanwhile in cases wherein the farmer sells directly to the consumer

FIGURE 13. RELATIVE FINANCIAL POSITION OF PLAYERS



Egg Production is capital intensive but based on 2018 Analysis, producers put it the highest capital but the least return compare to trader and retailer.

Farmer has a higher profit margin compare to Processors.

Processing Facility requires huge volume for economies of scale. Thus clustering model or forward integration for value added processing is recommended

Bench Mark Analysis

Technical Parameters for Layer Production

A study entitled Benchmarking of the Livestock and Poultry Industries conducted by Gonzales, et al in 2012 shows that the Philippines was generally at par with Malaysia and Vietnam in terms of its technical parameters of layer farms. For the depletion rate, the country was more efficient compared to Malaysia and Vietnam. However, the Philippines has the lowest recovery rate among the other four ASEAN countries (Indonesia, Malaysia, Thailand and Vietnam).

The laying rate among the five ASEAN countries ranged from 79% to 85% . The lowest laying rate was recorded in Malaysia while the highest were attained by Thailand and Indonesia. Closed house layer farms in Thailand can produce over 300 eggs while the large farms in Indonesia can reach up to 310 eggs per bird per year.. On the other hand, Malaysia has the least number of eggs per bird per year with an average of 290 eggs.

In terms of feed conversion ratio (FCR), closed layer houses in Thailand and large layer farms of Indonesia were the most efficient users of feeds. Medium sized farms in the Philippines, Malaysia and Vietnam attained the highest FCR. This means that these countries have the highest feed requirement for layer chickens to grow.

On the other hand, the Philippines has attained the lowest percentage of saleable eggs estimated at 90-92%. It also has the lowest depletion rate together with open house and closed house layer farms in Thailand. These findings imply that the Philippines has the lowest recovery rate and highest mortality rate in the chicken layer. Overall, large farms in Indonesia and closed houses in Thailand were more efficient among the other countries.

TABLE 10. LAYER TECHNICAL PARAMETERS, 2009

Parameter	Philippines			Indonesia			Malaysia			Thailand		Vietnam	
	S	M	L	S	M	L	S	M	L	OH	CL	M	L
Laying Rate ¹ (%)	80	80	80	80	82	85	79	79	79	81	>82	79	>80
Number of Egg/Bird/Year	292	292	292	292	301	310	290	290	290	296	>300	290	>292
FCR ² (kg/dozen egg)	1.50	1.58	1.48	1.50	1.51	1.40	1.51	1.59	1.50	1.55	<1.45	1.59	<1.48
Recovery Rate ³ (%)	90-92	90-92	90-92	95	97	99	96	97	97	92	>97	95	>95
Depletion Rate ³ (%)	15	10	10	16	15	14	15	15	15	10	10	15	15

¹Total eggs produced per day/Total number of layers in the hen house

²Feed Conversion Ratio; Assumed 100 gm/bird/day for Small Farm; 105 gm for Medium Farm and Open House; 99gm for Large Farm and Closed House

³ Saleable eggs

⁴Mortality Report

Notes: S= Small Farm; M= Medium Farm; L= Large Farms; OH= Open House; CH= Closed House

Financial Parameters for Layer Production

A past study on the estimated costs of layer production which was conducted in 2009 by Gonzales, et al revealed that the farm costs per dozen eggs in medium and large farms in the Philippines were comparable to open houses in Thailand and medium to large farms in Vietnam. These were also one of the closest farm costs in chicken egg production among the five ASEAN countries. However, the small farms in the Philippines had one of the highest farm costs next to the medium farms in Malaysia.

Overall, the cost of feed has the highest percent share in the total farm cost. Medium to large farms in Malaysia have the highest percent share of cost of feed. This implies that Malaysia has the highest feed costs among the ASEAN countries. Moreover, the Philippines also has the lowest labor and overhead (water, rental, electricity and tax) costs.

However, changes in these data are expected since the study was conducted more than a decade ago. A recent study was conducted by SEARCA in 2021 but the results are not yet published.

TABLE 11. CROSS-COUNTRY COMPARISON OF LAYER PRODUCTION IN SELECTED ASEAN COUNTRIES, 2009

Item	Philippines			Indonesia			Malaysia			Thailand		Vietnam	
	S	M	L	S	M	L	S	M	L	OH	CL	M	L
Operation & Maintenance													
Cost of Feeds¹	0.74	0.62	0.64	0.64	0.74	0.74	0.62	0.63	0.62	0.59	0.58	0.60	0.58
Cost of layers²	0.04	0.09	0.09	0.11	0.02	0.02	0.14	0.13	0.13	0.09	0.08	0.09	0.08
Labor	0.06	0.01	0.01	0.02	0.02	0.02	0.06	0.06	0.06	0.03	0.03	0.02	0.02
Overhead³	0.01	0.01	0.01	0.02	0.01	0.01	0.04	0.04	0.03	0.02	0.04	0.02	0.03
Total farm cost per dozen egg	0.88	0.75	0.75	0.80	0.80	0.90	0.90	0.89	0.88	0.75	0.78	0.76	0.75
Percent share to total farm cost													
Cost of Feeds¹	84%	83%	85%	80%	93%	93%	69%	71%	70%	79%	74%	79%	77%
Cost of layers²	5%	12%	12%	14%	3%	3%	16%	15%	15%	12%	10%	12%	6%
Labor	7%	1%	1%	3%	3%	3%	7%	7%	5%	4%	4%	3%	3%
Overhead³	1%	1%	1%	3%	1%	1%	4%	5%	3%	3%	5%	3%	4%

¹ Cost of feeds includes feeds, vitamins, minerals supplements and other feed ingredients

² Cost of layers includes day old chicks, pullets, layers

³ Overhead cost includes electric, water, rent, tax

2009 average US dollar exchange rate=Php 47.68

Competitive Analysis

Chicken egg is a relatively minor industry compared to broiler chicken. Egg production in the Philippines mainly serves the domestic market. Thus, no export of eggs takes place. The country used to import eggs in shell until the mid-1990s. Today, most of the imports are in processed form-dried egg yolk and powdered eggs-which are preferred and used by bakers, food manufacturers, and the food service industry.



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MARKET TRENDS AND PROSPECTS

Macro Environment For Food , Agribusiness And Biofuel Chain (Global Scan)

Socio/Cultural Environment – Consumer Movements

- Concern about food waste, recycling, reusing, increasing value to circular economy.
- Concern about inclusion and social innovation (smallholders).
- Food miles movement empowering 'buy local' and other regional initiatives.
- Increasing demand for image and country of origin denomination. Ethnic foods, artisanal products (home-made), organic and other experiences.
- Authenticity, simplicity, ethics and openness to dialogue. Slow-food movement (eating and enjoying).
- Positive attitudes toward direct 'farmers-to-consumers' channels (farmers' markets).
- Multicultural approach: cultures differ in markets and so do consumers' behaviour, diets, lifestyles, and insights.
- Increasing purchasing power of consumers and possibilities of increased choices.
- Land use issues (preservation) and animal welfare (free range and others); greater social pressure in relation to the scarcity of resources; increasing engagement of Millennials in sustainability topics.
- Climate change and climate-related issues; concern about carbon measurement and management (carbon footprint); climate- and planet-friendly behaviour.
- Simplicity lifestyle; time-saving movements (buying time, learning how to use time, etc).
- Older population issues (+65 will double by 2030).
- Gender roles and related food products.
- New role of influencers with consumers.
- Growth of online buying behaviour (also households growing own fruits and vegetables).

- Increasing collectivism and engagement approach.
- Increasing appreciation of small and local businesses.
- Increase in sanitising, hygiene care and greater knowledge of virology. Increasing appreciation for certification; demanding more security and traceable products.
- Paying more attention to diet (feeling good, healthy, well-being, nutrition). Increasing curiosity and acceptance of alternative and sustainable
- ingredients sources (lab meat, other plant-based products, insect protein).
- Greater interest in the origin, sources, reliability of news.
- Increasing confidence in science and agriculture.
- Increasing value to 'made in ... my country'.
- Increasing activist approach and engagement; increasing connectivity of food consumers.
- Appreciation of moments with family, (cooking, eating together). Expansion of Asian culture and influence (food and others).
- Others

POLITICAL/LEGAL (REGULATORY) ENVIRONMENT

- Governmental/public policies interventions and regulations. Evolving role of NGOs (non-governmental organizations) and
- pressure groups as influencers.
- Labour legislation and trade unions.
- Environmental legislation.
- Tari barriers.
- Agricultural subsidies policies.
- Certification laws.
- Investments incentive programs.
- International trade regulations.
- Tax policies.
- Crisis-related interest rate cuts; liquidity injection; credit lines; tax relief; and suppression of some regulatory obstacles; vouchers for informal workers.
- Governments going 'online'.
- Increase in health budget and regulation.
- Increase in budgets for public R&D.

- Prohibition of trade of exotic products and increased 'wet market' regulations.
- Policies for local production incentives.
- Product labelling and traceability requirements.
- Data and information protection.
- Changes in labour safety laws.
- Restrictions on freedom and individual movements.
- Interruption of some production and distribution chains, prices & tax regulations.
- Embargo over some products due to shortages and international political conflicts.
- Problems of stability and political crisis.
- Labour restrictions and shortages for agricultural activities (handpicked and others).
- Increase in food safety regulations.
- Increase in food self-sufficiency policies after the Coronavirus event. Regulations for pollution, plastic and other types.

ECONOMIC AND NATURAL ENVIRONMENTS

- Asian and emerging nation-driven world (70% of world GDP in 2030) and their fast recovery from the crisis.
- GDP/demand growth and diet changes.
- Pandemic and its impacts on global economic growth and development Exchange rates, interest rates and inflation.
- Economic borders (agreements and trade).
- More transparent income and profit allocation and distribution; search for inequalities, solutions to poverty, hunger.
- Growth of bio-economy (mass, plastic, fuel, electricity)-based chains. Natural resources scarcity.
- Different world regions productivity levels and gaps.
- New types of insurances & other risk management tools.
- Circular economy (using by-products as inputs).
- Industries consolidation and growth of Chinese influence.
- Global investors and faster capital flows (credit), with new currencies. Terrorism risks for food stocks, food transport.
- Volatility in world food prices.
- Increasing value of biodiversity.

- Education as a basic source for competitiveness.
- Sharing economy (Uber models).
- The food bridge: from the Americas (food production) to Asia (food consumption).
- New labour forms, work models (at home, during commute, part time others).
- Increase in home offices and simplification of processes, resulting in the need for workers and physical space.
- New sources of protectionism.
- Precarity: job and income insecurity.
- Public (government) debt.
- Health risks in food production industrial units and other stages of the chains.
- Private companies providing more micro credit plans and fintechs. Crowd-funding movements.
- Restaurants trending toward the delivery model.
- Increase in raw material stocks.
- Natural disasters.
- Diseases and plagues.
- Effects of climate change in producing areas.
- Possible water shortages, flooding, and weather events.

TECHNOLOGY ENVIRONMENT

- Increasing data generation, ownership and usage.
- Increasing information flows, transparency, traceability and identity preservation.
- Increasing levels of security (data, quality assurance, zero contaminations).
- Allowing consumer communication tools (from in-person to digital platforms).
- Digital contracts.
- Higher levels of innovation and entrepreneurship in food chains. Increasing gaps among users and non-users.
- Smart farms and precision agriculture: digital farming everywhere with GPS-guided equipment, data-driven drones, analytics software, advanced equipment.
- Convergence of industries (food and medicine, food and cosmetics). Gene editing: resistance, resource usage, productivity and consumers; increasing biotech, genomics, traits; fungi, bacteria and drought-resistant crops.
- Enhancing intellectual property.

- Natural lab-produced food substitutes (food coming from different sources); increase in meat substitutes (plant-based).
- Organics and yields.
- Increasing number of start-ups.
- Increasing amplitude of tablets/phones and their services.
- Artificial intelligence (robots).
- 3D printing (seeds, etc.).
- Energy sources (solar power and others much more accessible); Energy generation technologies expected to become cheaper. Increasing tech innovations related to services, experiences, and relationship marketing.
- Tech-driven diversification toward complete solutions: a chemical company to a seed company, to precision planting, to climate monitoring and high-tech services.
- Greater use of digital and mobile, with an increase in online meetings for socialising and business.
- Expansion of support areas to the digital environment.
- Increase in online commercial platforms (marketplaces).
- Aerospace technology, nanotechnology and others.
- New tech-inspired forms of marketing (the use of 'lives', etc).
- Tech and metropolitan agriculture.
- Super plants and superfood (with high level of proteins, minerals, etc). Regenerative agriculture.
- Bioplastics and all other bio developments.
- Accelerating R&D and robotics (mainly for harvesting).
- Increasing technology and data in retailing.
- Apps in several activities of food production.

Market Trends and Prospects

A Prosperous Maritime Archipelago

PAGTANAW 2050 chart a strategic path by anticipating the factors that will influence the development of the Philippines' scientific capital in the years leading up to 2050. It is based on a rigorous evaluation of key trends in science, technology, and innovation (STI) in the Philippine setting. It is meant to serve as a planning device towards achieving concrete goals and designing strategic plans that shall transcend political periods whilst aiming for inclusive growth, sustainability, and competitiveness in STI.

First, globalization has been interrupted, and it is critical to understand whether this will be a brief interruption or a mere blip. Due to the factors related to COVID-19 and, perhaps, also the political environment (e.g., populism), this may be a more protracted adjustment period for broader globalization trends (Neuman 2020).

MEGATRENDS

1. Population - Young population with 53% belongs to the age group 0-24. Potential source of the talent pool for science, technology, and innovation. Need : Dividend are those where the working-age population have quality education, good health, and where there are sufficient quality job . In the next three decades, these demographic shifts will continue to have an impact on economic growth and well-being, especially as developing countries, including the Philippines, transition to higher income status. The expected shift of manufacturing to greater automation, and the pressure that change will exert on lower- skill work, poses a particular challenge to countries that have yet to benefit from the demographic dividend.
2. Migration - Pandemic and Climate Change - internal and external migration This includes people moving away from lower water availability and crop productivity, and coastal areas with rising sea levels and storm surges. This projection may be especially important for the Philippines, which is visited by an average of 20 typhoons per year and has experienced ve of the strongest tropical cyclones in history—four of which were experienced just in the last 10 years
3. Poverty - lower education, who live in rural areas, work on farms, and are part of big households are still over-represented among the poor (Dugarova and Gulasan 2017; World Bank 2020b). Despite rapid urbanization in most developing countries, poverty is still predominantly a rural phenomenon, accounting for nearly two-thirds of total national poverty.
4. Economic Inequality

Intervention

1. The government needs to increase and protect investments in human capital by building a more crisis-resilient and inclusive healthcare system, and equipping the vulnerable population with STEM education, and specialized education to combat misinformation (critical thinking)
2. Government needs to be agile and innovative in creating new livelihood opportunities as the disruptive forces in the economy start to operate. Leveling the playing field should be accompanied by opportunities to earn a decent living
3. Lastly, barriers in technology adoption among businesses and populations need to be addressed through exible and adaptable government policies. Promoting strong competition across sectors will be crucial in facilitating an environment conducive to strong innovation and technology ows.



TARGET SETTINGS

Our Vision

Eggs nourishing every Filipino. Egg Industry leading to a healthier Philippines and better food system.

Our Mission

To make eggs part of the daily life

Goals , Objectives and Targets

Philippine Egg Industry Plan 365

The Roadmap lays out where we want to head, and how we intend to get there. The insights, goals or aspirations, actions , impact and targets under the 5 ROADMAP PILLARS

Roadmap Pillar I: Customer and Industry Value

Its 2040. Egg is a solution to achieve Zero Hunger. Filipinos are the biggest gainers in a decade of smart investment in the food system infrastructure, which has increased the value of goods and driven down the cost of local food production and reaching key markets.

The focus on health and nutrition and the incentives which seeded dedicated food hubs across the country created synergy in private investments, government food security plan and community development.

Technology has changed the way we trade –making market access seamless, safe and streamlined -and providing clear market signals to guide industry investment.

Local fresh produce stands for quality and integrity, and commands a premium price to match. At every step on this journey, we have engaged our customers –giving them a transparent insight into the way we farm and meeting their changing expectations.

INSIGHTS	ASPIRATIONS	ACTIONS OBJECTIVES	IMPACT	METRICS & TARGET
<p>Undernutrition is, and has always been, a serious problem in the Philippines.</p> <p>Nutritionally and economically, the egg is always been unbeatable. Now is the perfect time to promote egg as affordable, nutritious and a low impact food source</p> <p>Good nutrition is a foundation for economic prosperity</p>	<p>P1 GOAL 1</p> <p>Filipinos love eating Eggs and nutritious food.</p>	<p>One Campaign against Protein Malnutrition.</p> <p>Grow or establish industry initiatives to improve two-way communication with the consumers, including a strategy to educate the public about nutrition , agricultural practices and advise industry where practice change</p>	<ul style="list-style-type: none"> • Greater reach and impact of industry communications. • Industry understands and responds to consumers expectations • Shared respect and understanding • Consumers are more informed about egg farming practices 	<p>National Egg Consumption per Capita, 150 by 2023, 200 by 2030, 300 by 2040</p> <p>Marketing - Positive Image of Eggs and Egg Agri-techpreneurs</p> <p>Trade - Inclusion of Eggs in Zero Hunger and Poverty Alleviation Program.</p>
		<p>Establish standards , egg handling , and suggested retail price.</p>	<ul style="list-style-type: none"> • Consumer Protection • Fair Price and Stable Market 	<p>Food Safety - Quality and Fair Priced Eggs reach consumers</p>
		<p>Build on distribution system, packaging, traceability and labelling systems to improve the integrity of product information provided to the community.</p>	<ul style="list-style-type: none"> • Improved understanding of provenance and production attributes • Product integrity and biosecurity as a competitive advantage • Labelling laws which help consumers make fact based decisions on imported or 'alternative' foods 	<p>Egg prices are stable. Less volatility and treated as products</p>

INSIGHTS	ASPIRATIONS	ACTIONS OBJECTIVES	IMPACT	METRICS & TARGET
<p>Food System is not just physical infrastructure. It requires mindset transformation.</p> <p>Egg industry is relatively small compare to crops, swine , broiler and fisheries but is more inclusive in terms of number of commercial farmers, cooperatives and large industry partners.</p> <p>Industry innovation is also a successful Public - Private - Partnership.</p>	<p>P1</p> <p>GOAL 2</p> <p>Egg Industry leads to a healthier Philippines and a better food system.</p>	<p>Create national Egg Innovation Hub .</p> <p>Promote linkage of the 3 sectors - primary (production) , secondary (processing and manufacturing) and tertiary (service) as One Eggcosystem</p>	<ul style="list-style-type: none"> • Collaboration across the industry stakeholders in achieving Egg Industry Sustainable Development Goals • Food Sufficiency planning cuts across • and reach the people 	<p>Food System Awareness and Programs at barangay level</p> <p>Stakeholders Engagement. Participants count and number of Industry events and programs linked with national programs related on SGDs.</p>

Roadmap Pillar II: Growing Sustainably

Small holder or Backyard operations are for self-consumption and for selling something extra as a family income. Small and scavenging flocks controlled by cooperatives, villagers and families are prevalent in rural areas, where they contribute to poverty alleviation and food security.

Commercial Egg Farms are intended to feed millions of population in the urban , peri urban and high demand areas. However, as larger production farms become more common, siting issues regarding biosecurity will have an impact on small-scale village and family flocks, possibly leading to conflict if proper management practices are not exercised. The sustainability and potential expansion of any poultry production or processing operation are affected by its location, especially in the long term. This is particularly true of operations located near urban or peri-urban areas. These factors demand careful planning of the location and siting of poultry production units. Failure to take such planning considerations into account when constructing new and larger facilities may result in costly changes or management expenditures in the future.

INSIGHTS	ASPIRATIONS	ACTIONS OBJECTIVES	IMPACT	METRICS & TARGET	
<p>The Philippines is self sufficient on eggs, but is vulnerable .</p> <p>The chicken egg market is fairly competitive and production is not controlled by any large firm, however seasonal egg glut or shortage of chicks, high input cost, biosecurity, land use and climate resiliency concerns continuously post a threat on the sustainability of the industry.</p>	<p>P2 GOAL</p> <p>Closed Loop , Integrated Egg Industry</p>	<p>Implement Ecosystem Framework in key production areas.</p> <p>“Eggcosystem Model” – closed loop . See Figure P2 -Food System – Industries & Stakeholders</p>	<ul style="list-style-type: none"> • Food security to targeted market. • Reduced value chain bottlenecks • Lower transport and logistics costs • Improved global competitiveness • Increased value-adding • Increased employment in food manufacturing • Increase product value • Market driven production systems • Meet and anticipate customer needs 	<p>RAD - for North Luzon, South Luzon Visayas & Mindanao</p> <p>100% by 2040</p> <p>Number of infrastructure set up as per Figure P2A</p> <p>Farm / Farm workers Registration</p> <p>100% by 2025</p> <p>Compliance to Waste Management Laws - Available and affordable providers</p>	
		<p>Establish Regional Agriculture Deals (RAD) to provide a multi-government framework for physical infrastructure investment and regional development policy.</p>			<ul style="list-style-type: none"> • Well Planned • Fit for Growth Location, siting and concentration of poultry units
		<p>Map strategic transport infrastructure for food system to identify cost reduction opportunities. Introduce consistent national transport regulations.</p> <p>Establish food manufacturing precincts in key growing regions with access to export facilities.</p> <p>Implement value chain technologies and processes that inform prices and strengthen market signals.</p>			
		<p>Implement farm standards, zoning, and appropriate public goods / infrastructure</p>	<ul style="list-style-type: none"> • Investment in conservation tax instrument • A natural capital accounting system 	<p>Conversion of Chicken Manure</p> <p>100% clean up by 2030</p> <p>Aerosol Contamination</p> <p>Level of Integration (Downstream , Upstream)</p> <p>Cost Reduction</p>	
		<p>Establish a government- backed Environmental Stewardship Fund, aimed at seeding a marketplace for private sector investment</p>	<ul style="list-style-type: none"> • Biophysical asset management balances production with conservation • Remuneration for positive environmental contributions • An active market for private investment in on- farm stewardship 		

Roadmap Pillar III: Unlocking Innovation

The populations that will suffer the most from the increase in food prices are the poor people across the world. Reasons for this are, among others, that “lower income consumers spend a larger share of their income on food [and] bulk commodities account for a larger share of food expenditure in low income families”. Egg is a solution. Let’s start maximize the value of eggs by extracting its nutraceutical and functional elements, extending its shelf life, and value addition of its by-products

INSIGHTS	ASPIRATIONS	ACTIONS OBJECTIVES	IMPACT	METRICS & TARGET
Food is becoming expensive due to increasing cost of production, growing demand and market inefficiencies.	P3 GOAL A globally competitive industry where all stakeholders are benefitting through innovation.	Implement the food value hierarchy . See Figure P3.	<ul style="list-style-type: none"> • Increase productivity and efficiency 	Productivity Innovation Index
		Collaborative and Focused Approach in innovation.	<ul style="list-style-type: none"> • Results driven and faster time to market • Frameworks for beneficial collaboration • Reduced duplication and improved efficiency • Increased private R&D investment • Better monitoring and evaluation frameworks • Greater return on public investment 	Commercialization Local resources utilization Egg Innovation Facility Feed Inputs and Alternatives Feed Stuff Hub & Facilities Feed supplements and additives Hub and Facilities Genetic diversity and conservation of genetic resources Policies Monitoring, Replication, & commercialization Extension Services
		Invest in the capacity of digital and human networks to share and promote new practices and tools appropriate for traditional systems, which include family poultry consisting of scavenging birds and backyard raising; ·small-scale semi-commercial systems; and large-scale commercial systems	<ul style="list-style-type: none"> • Science based regulation • World class access to technology 	

Roadmap Pillar IV: Capable People and Vibrant Communities

Working in Egg Industry may it be in primary (production) secondary (manufacturing) and tertiary (services) is recognised as a rewarding and aspirational career choice for people of all skill levels and backgrounds. We attract and develop people to match the needs of our sector and we adapt to the shifting needs of the future. They are leaders, critical thinkers, technical experts, those who work with their hands and more. Our reputation for workplace excellence attracts phenomenal human talent from the Philippines and around the globe.

INSIGHTS	ASPIRATIONS	ACTIONS OBJECTIVES	IMPACT	METRICS & TARGET
<p>There are many commercial players in the Egg industry.</p> <p>Farm workers in traditional crops are migrating to work in egg farms.</p> <p>Egg retailing and distribution in communities are thriving</p>	<p>P4 GOAL</p> <p>Strengthen the economy by promoting enterprise development and by increasing stakeholders' income and community benefits</p> <p>There is a clear career pathway to attract workers and develop their skills,</p> <p>with tailored streams for new entrants through to seasoned professionals.</p> <p>We have robust and sustainable mechanisms to access labour</p>	<p>Apply an agriculture lens to school and tertiary education curricula.</p> <p>Promote the compelling rationale for a career in agriculture.</p> <p>Establish a nationally consistent, 'trade- equivalent' job brand for skilled farm workers.</p> <p>Grow professional development, leadership and mentoring opportunities for employees and business owners.</p>	<ul style="list-style-type: none"> All Filipinos are exposed to agriculture Agriculture is a career of choice Pool of qualified, skilled labor Greater clarity skilled on-farm roles Continued opportunities for development A strong pool of industry leader 	<p>Double the number of tertiary and vocational agriculture graduates by 2040</p> <p>Meeting Economic and Social Indicators such as</p> <p>Poverty Reduction</p> <p>Unemployment</p> <p>UnderEmployment</p> <p>Migration</p>
	<p>P4 GOAL 2</p> <p>We live in strong communities that are have world class education and health facilities; culture and entertainment; and a diverse economy.</p>	<p>Ensure every regional economic development plan includes agriculture and value chain industries. Complement existing regional plans with the Regional Agriculture Deals approach. See P2 Egcosystem Approach.</p> <p>Build leadership capability and regional development 'literacy' and practice</p> <p>Champion provision of urban-equivalent infrastructure.</p>	<ul style="list-style-type: none"> Introduce agriculture at key career decision point Reduced unemployment A positive experience for farm workers New economic opportunities for regional communities Integrated economic plan for agriculture Great schools in rural and regional communities. High speed connectivity Access to health services Safe roads and communities Access to retail, financial and professional services 	

Roadmap Pillar V: Capital & Risk Management

Egg enterprises have become increasingly sophisticated in their approach to governance, risk management and planning for the future. Every farm has a clear strategy for managing the inherent risks of farming, including an expanded role for insurance, and business models which share production risks along the value chain. Commercial layer enterprises are investment- ready.

INSIGHTS	ASPIRATIONS	ACTIONS OBJECTIVES	IMPACT	METRICS & TARGET
<p>Agriculture is volatile.</p> <p>Disease outbreak pose a high threat and Banks are selective on farm credit focusing on medium to large commercial scale producers.</p>	<p>P5 GOAL</p> <p>Create a data driven enterprise model that will support chicken eggs to continuously meet the 4 global food and nutrition security index i.e affordable, available, safe, and resource resilient Farm businesses have embraced new governance models -helping them better plan for the future, manage risk, and increase profit. Innovative tools to reduce the inherent risks of farming are used by every egg farm business - supported by consistent and well administered government risk management policies.</p>	<p>Champion producer peer review boards and benchmarking groups to inform farm business decision making.</p> <p>Support cross-sectoral capacity building initiatives for financial literacy, leadership and corporate governance.</p> <p>Continue to promote proactive succession planning.</p> <p>Educate industry stakeholders about financial risk management options (including income and multi-peril crop insurance, swaps and futures) and support ideas to improve their availability and affordability.</p>	<ul style="list-style-type: none"> • Reduce uncertainty More rigorous business decision- making • Improved productivity and returns • Enterprise Continuity • Increased productivity Reduced risk • Global competitiveness. 	<p>Growth rate</p> <p>90% of family farms have documented business plans, including succession plans. Biosecurity Plan Monitoring</p> <p>Bureau of Animal Industry Strategic Reorganization</p> <p>Disease Control & Surveillance Facilities Diagnostic laboratories (3 Regions III, IV and NCR) and establishment of diagnostic laboratories in strategic areas (5 laboratories)</p>

RECOMMENDATIONS FOR POLICIES, STRATEGIES, AND PROGRAMS

Roadmap Pillar I: Customer and Industry Value

Filipinos love eating Eggs and nutritious food

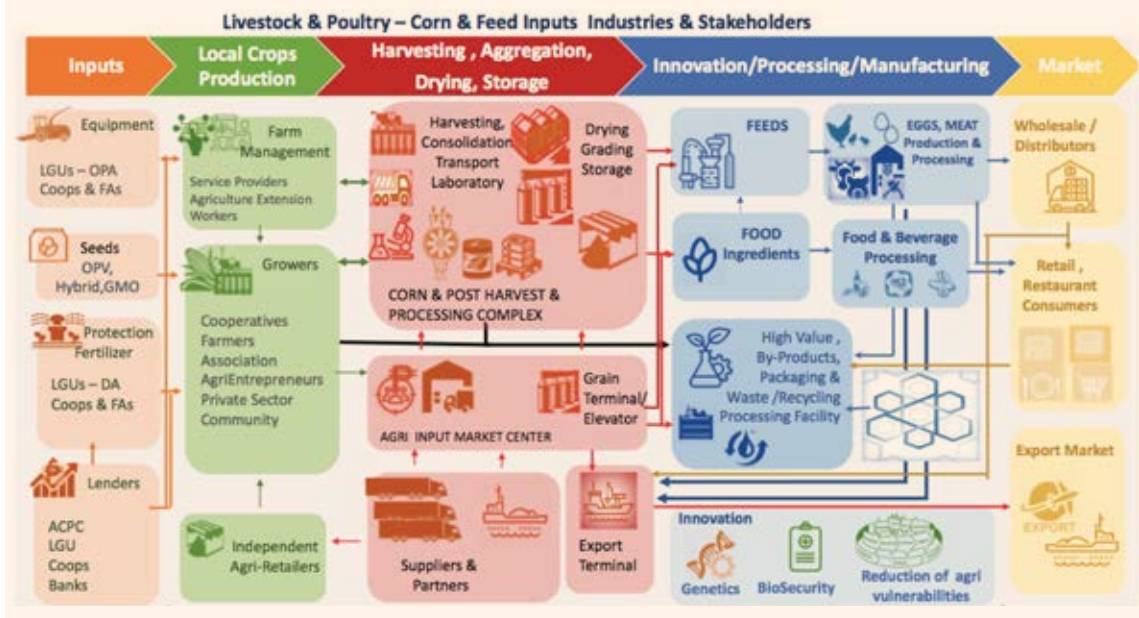
This is our expected consumption per Capita



1. **One Campaign Against Protein Malnutrition #LodiAngItlog - Private Sector Developed , DA to support**
2. **Egg and Milk Program - Private sector to lobby , Address the Milk Gap , DA to Intervene**
3. **Eggs in School - Promotion and joint Program with National Nutrition Council and Department of Education**
4. **Implement One Egg a Day is Okay - All Stakeholders**
5. **National Egg Innovation Hub - San Jose Batangas - Egg Basket of the Philippines**
 - a. **Animal Health and Biosecurity (Php 33 Million)**
 - b. **Egg Powder Pilot Facility (Php 50 Million)**
 - c. **Broiler , Spent Hen, Native Chicken Processing Facility (Php 150 Million)**

Roadmap Pillar II: Growing Sustainably

FIGURE 14. FOOD SYSTEM - INDUSTRIES & STAKEHOLDERS



As per industry analysis, currently, fragmented sources of public and private investment have no coordinating strategy. By setting clear priorities at the identified egg production regional level, and committing governments to policies and investments that complement those priorities, we can better support private sector investment and growth.

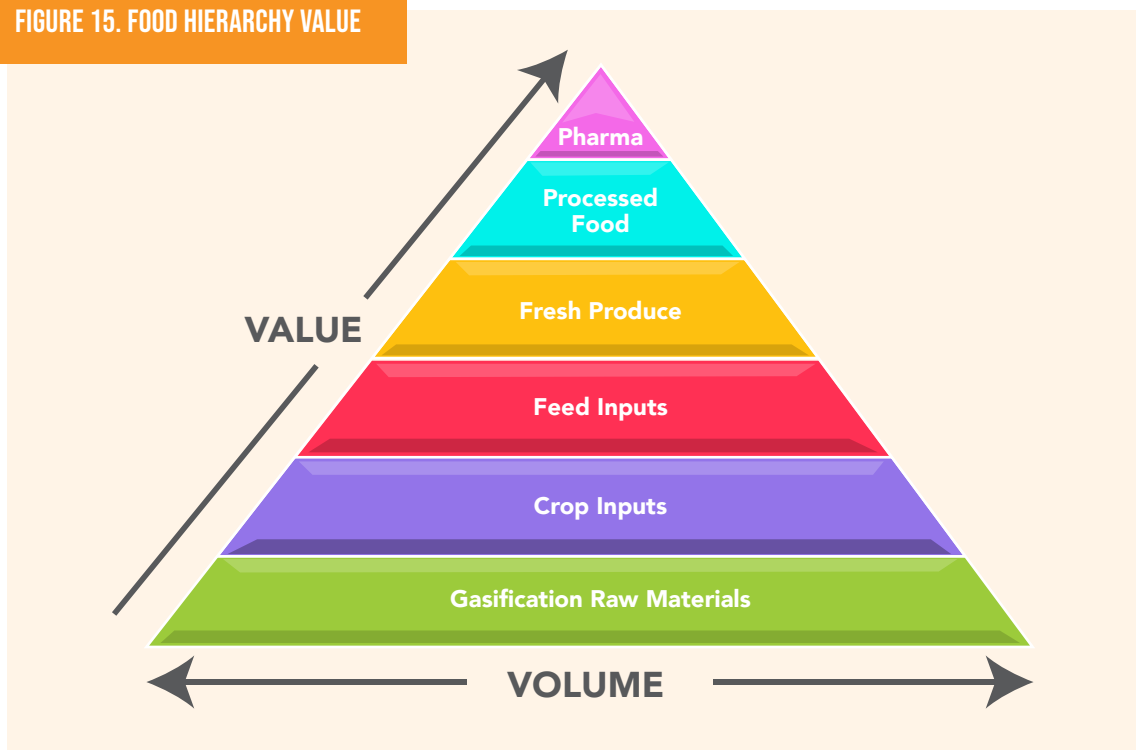
Key concepts

- Regional Agriculture Deals (RADs) are a binding agreement between national and local governments;
- A RAD will define the agricultural value chain priorities for a region, and commit all tiers of government to policies and investments which support those priorities; and,
- Regions will be defined by shared agricultural production systems and value chains –cutting across local government areas as needed.

This model builds upon the UK City Deals approach which concepts can be adopted in the Philippines. RADs will deliver a more focused and stable policy environment for private investment, grounded in detailed local consultation.

Roadmap Pillar III: Unlocking Innovation

FIGURE 15. FOOD HIERARCHY VALUE



Egg Innovation across the product value chain will be replicated in the traditional crops i.e. Rice, Corn and Coconut. By maximizing the value of agricultural commodities by extracting its nutraceutical and functional elements, extending shelf life, and value additions of its by products.

Egg Innovation Facility - Pilot BEPCO

Feed Inputs and Alternatives Feed Stuff Hub & Facilities Protein Enriched Copra Meal (Php 250 Mio project for R4A)

Feed supplements and additives Hub and Facilities (Local development, academe and Bureau of Plant Industry)

Genetic diversity and conservation of genetic resources (Partner with Academe and Breeders - Climate Reliant)

Policies Monitoring, Replication, & commercialization, Extension Services (One Government Approach)

Roadmap Pillar IV: Strengthen the economy by promoting enterprise development and by increasing stakeholders' income and community benefits

1. Clear Policies and Targeted Programs for enterprise development, specific to local needs.
2. Inclusion of Agriculture Development Plan in Barangay, Municipal/City, Provincial/ Regional level.

Devolution in Action to include Enterprise Building and Mindset Change. Strengthen cooperatives and associations, social enterprises and partners.

3. Government to create a level playing field for competitive industry.

Roadmap Pillar V: Egg Industry is data driven and meets the global food security index.

1. Public, Private and Community Partnership Projects to Protect Food and Feed Security
2. Clear Government Focus and Priorities - backed by numbers , market intelligence and jointly agreed by all stakeholders.
3. Robust Execution Plan for Animal Health and Welfare . Government to provide infrastructure that can protect the BioSecurity, Disease Control & Surveillance Facilities
 - a. Diagnostic laboratories (3 Regions II1, IV and NC) and establishment of diagnostic laboratories in strategic areas (5 laboratories)
4. Make Access to Credit, Insurance, Investment Incentives easy for domestic players

