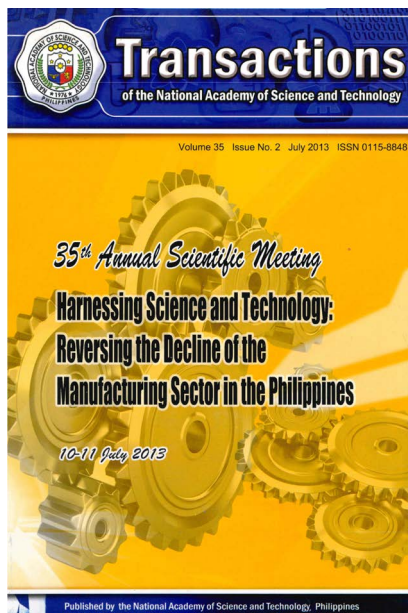


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Food and Wood Manufacturing: Current Status, Issues, and Recommendations

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Keywords

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FOOD MANUFACTURING: STATUS, ISSUES, AND RECOMMENDATIONS

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Abstract

The Philippine food manufacturing industry continues to be among the biggest and most active industries in the country, valued at PhP 977.2 billion in 2012. However, there are issues and concerns which the science community may be able to address. This paper aims to examine the food manufacturing sector to develop a technology-explicit road map for processed food products that would guide collaboration among government and private stakeholders in the sector.

Stakeholders who participated in the NAST-sponsored round-table discussions on food manufacturing identified a number of interrelated concerns that, if not addressed, could threaten the sector's competitiveness. The three major concerns are supply of raw materials, technology, and food safety. The following were recommended to address these concerns: (1) small farm holdings should be consolidated for economy with scale; (2) concerned agencies should strictly enforce the food safety regulations; (3) industry partners should provide research and scholarship funds to supplement the meager funds allocated by government for the training of new crop, animal and food scientists and extension workers; and (4) use science and technology, and economics in promulgating investment-friendly policies to attract both local and foreign investments. In conclusion, there is much room for growth and expansion but there is also greater demand and expectation for safe and quality products. The government is expected to play its role of facilitating businesses and enforcing safety and quality standards.

Keywords: food manufacturing, raw materials, food safety, competitiveness, food products

The manufacturing sector is the largest sector of the Philippine economy, accounting for 21 percent of the gross domestic product (GDP) (NSCB 2010). In 2009, it generated the most revenue, reaching 3.4 trillion pesos and accounted for 85 percent of all Philippine exports (NSO 2009). It is a major employer and source of foreign exchange (NSCB 2010). The sector provides many opportunities for the processing of raw materials from our natural resource-rich country into value-added products that have tremendous potentials in both local and foreign markets.

The many benefits, notwithstanding, there are numerous gaps in the manufacturing sector, which the science community may be able to address, particularly regarding access and use of modern technology to enhance the development of value-added products. This paper examines the food-manufacturing sector, with a view to developing a technology-explicit road map for processed food products that would guide collaboration among government and private stakeholders in the sector.

Status of the Food Manufacturing Sector

Philippine food manufacturing includes the production, processing, and preservation of meats, fish and other marine products, fruits and vegetables, and the manufacturing of vegetable and animal oils and fats, dairy products, grain mill products, bakery products, sugar and confectionery, food condiments and seasoning, snack food, food ingredients, and animal feeds (PSIC 2013).

The food manufacturing industry continues to be among the biggest and most active industries in the country (Palabyab 2013). It was valued at PhP 977.2 billion in 2012, accounting for nine percent of the GDP and 45 percent of the total Philippine manufacturing industry. From 2009 to 2012, the industry grew at an average of 8.5 percent annually, based on gross value added at current prices whereas; the total manufacturing industry grew by 1.9 percent only.

In 2012, exported processed food reached USD 2 billion, equivalent to 57 percent of the total food exports. This indicates an increase in the value our food export. The implementation of the ASEAN Economic Community in 2015 is expected to encourage and further open trade among Southeast Asian countries, thus, opening up more opportunities for growth for the

Philippine food manufacturing industry (Palabayab 2013; De Leon 2013). Likewise, the local market for processed food is projected to continue to proliferate and spread as development reaches the rural areas and the Filipino families' income generation improves.

Regarding fish and other marine products, Tayamen and Ragaza (2012) reported that the value of fishery exports in 2010 reached PhP 36 billion. Approximately 75 percent of the total catch are sold as fresh or chilled in wet markets and 25 percent are sold as processed products (salted, dried, smoked, in brine, canned, etc.). Processing of fish in the country is still traditional, except for canning and freezing where developments have taken place in the recent years. Value-addition has also been an emerging trend, increasing the marketability of underutilized fish species such as sardines. Increasingly, fish is processed into a variety of products such as tuna longganisa, tuna ham, fish hotdogs, fish burgers, bangus spring rolls, and other ready-to-cook products for both domestic and export markets.

The main products from marine fisheries are canned tuna (there are more than 20 canneries) and processed crustaceans and mollusks for exports. The main products produced from the processed fish subsector are commercial feeds (there are about 10 companies) and processed shellfish, tilapia, shrimp, pangasius, and seaweeds (carrageen) in aquaculture for both local and export markets. Fishmeal production absorbs underutilized fish species, processing wastes, and rejected dried and smoked fish products.

Regarding meat processing, this industry is considered as fast growing also, as evidenced by recent expansion of operations by some of the major players (i.e. San Miguel Foods, CDO, Meken) and the birth of several new players, including the sprouting of home-based micro-, small-, and medium-scale meat processors. It is noted that the exports of processed products like canned ham and sausages have been increasing since 2007. A 98.9 percent increase in the value of exported canned ham was recorded in 2008-2009; sausage export had increased by an average of 17.1 percent annually from 2007 to 2009. On the other hand, the volume and corresponding value of imported canned ham had tremendously decreased from more than 4,428 MT (valued at USD 2.08 million) in 2007 to only 143 MT (valued at USD 41,177) in 2009 (Lo and Manantan 2012; Abanto 2012).

Palabayab (2013) cites several income-developing factors affecting the industry's continuing progress, including:

1. The increasing incomes sustained by remittances of overseas Filipino workers (OFWs), the expanding middle class and urbanization, and spread of business product outsourcing (BPOs), which have led to changes in people's lifestyle and diet, thereby increasing the demand for convenient and ready-to-eat food products.
2. The increase in the size and number of malls, supermarkets, hypermarkets, and other convenience stores, which provide consumers with more access to processed and packaged food.
3. Local food manufacturers continue to thrive despite the sturdy market of multinational companies and flow of imported products in the country due to their familiarity and understanding of the local market and a deep-rooted local network for product distribution.
4. Local food manufacturers have developed their capability through the years and are now able to match the quality of imported products, even coming up with strategies for more affordable pricing that foreign companies often cannot compete with.
5. Government initiatives to invite foreign companies to invest and conduct trade in the country has brought international competition to local food manufacturers, resulting in the development of local companies' capability and increased know-how in competing globally. Several local food companies have already started to enter the global market, with some venturing their businesses outside the country, such as San Miguel Pure Foods Co., Universal Robina, and Liwayway Corporation.

Issues and Concerns

Stakeholders who participated in the NAST-sponsored roundtable discussions on food manufacturing identified a number of interrelated concerns that, if not addressed, could threaten the sector's competitiveness, especially with multinational companies establishing a foothold in emerging countries like the Philippines. The three major concerns are supply of raw materials, technology, and food safety.

Supply of raw materials

Food manufacturers need a reliable supply of raw materials, especially in terms of quality, quantity, time of delivery, and cost. In general, they obtain raw materials through importation, by buying from independent growers, and through contract-growing. However, for a more extensive coverage on strategic sourcing options of raw materials, please see Mojica et al. 2013.

Importation. Sourcing of raw materials from other countries is inevitable because not all raw materials can be efficiently grown locally to meet the quantity and quality demands of the food manufacturing industry. Examples are shown in Table 1.

Except for tomato paste, puree, spices, and coffee, the raw materials in Table 1 were identified for importation after wide ranging consultations with industry stakeholders, farmer leaders, agency representatives, and academicians, taking into consideration the Philippines' endowment to produce and comparative advantage of growing and trading them (NAST PHL 2012). Similarly, in the case of tomato paste, puree, spices, and coffee, domestic production cannot meet the volume, consistency, and quality requirements by the processing industry. On the other hand, the NAST discussions identified some crops for exports (e.g., banana, pineapple mango, coconut, sugar, papaya, seaweeds, herbals, ornamentals) and for self-sufficiency (e.g., rice, white corn, yellow corn, palm oil). In other words, it is more prudent to import certain raw materials to ensure the regularity of supply of the right raw materials in order for the food manufacturing industry to be able to compete in the world market. A major drawback of continued dependence on imported raw materials would be the sector's high vulnerability to fluctuations in the price of the materials, which could seriously affect profitability.

Table 1. List of most commonly imported raw materials, value, and country of origin.

Raw material	Value (USD million)	Major supplier
Wheat	825.3	USA, Canada, China
Whey	62.7	USA, Netherlands, France, Australia
Tomato paste and puree	22.4	China, USA, Turkey
Spices (in bulk)	3.1	USA, Hong Kong, Singapore, China
Coffee	45.0	Indonesia, Malaysia, USA
Milk and cream	447.0	New Zealand, USA, Australia
Red meat	137.1	India, Brazil, Australia
Animal fats and vegetable oil	542.9	Malaysia, Singapore

Source: Adapted from Palabyab (2013)

Note: Values based on highest importation in the last 10 years

Buying from independent growers. Small food manufacturers with limited capital obtain raw materials from the local market or by making informal agreements with several independent growers, often in exchange for inputs and cash advances. This practice is called contract buying. In some cases, they procure raw materials from enterprising middlemen who also provide inputs and cash advances to growers. Consequently, manufacturers are not assured of quality, quantity, timeliness of delivery, and reasonable prices for the raw materials. Small growers with a poor agriculture base do not enjoy the benefits of modern technology. Low productivity, high production cost, and big postharvest losses resulted in high prices of poor quality raw materials. The latter is likely to happen when there is no prior agreement between the growers and food manufacturers.

Contract buying is expected to be continually by practiced small- and even some medium-scale food manufacturers. Thus, the practice needs to be improved to better serve the sector.

Contract growing. This practice, although associated with a number of challenges, is still the best option for food manufacturers because it ensures

an inexpensive and reliable supply of raw materials in terms of quality, quantity, and timeliness of delivery. For it to succeed, however, it is important to consolidate small-farm holdings to have economy of scale. This can be done via cooperatives and farmer's associations following successful models like the Taiwan experience on grower-factory agreement, which capitalizes on proven technology, inputs, sound management, and ready markets (Villareal 1980, 1990 and 2006).

In the Taiwan model, raw agricultural produce (e.g., mushroom, bamboo, asparagus, tomatoes) is collected from growers. The contract specifies the respective responsibilities of the factory and grower. For example, in the case of processing tomato, the factory assigns one production technician for every 50 hectares, determines the variety to be planted, and provides inputs and sprayers at cost, transportation costs of harvested tomatoes from the designated collection center to the factory, and crates.

The grower, on the other hand, provides the use of his/her land as identified by the assigned technicians for the purpose, commits to follow the production technologies of the factory and allow the technician and factory representative to inspect the farm, uses the prescribed crates, and programs the transportation from the farm to the designated center. In some cases, the factory and grower agree on a guaranteed price of tomatoes.

The agreement is mutually beneficial because the grower is assured of a market for his/her produce and the factory is assured of raw material supply.

In the case of aquaculture, the lack of raw materials is due to poor technology, especially the use of low inputs (feeds) due to high cost (Guerrero 2012). In the marine fishery sector, the declining supply of raw materials is due to overfishing, inappropriate management practices, and destructive fishing methods employed by irresponsible fishermen.

Technology. Another concern, especially by micro-, small-, and medium-scale enterprises (MSMEs), is the availability of appropriate technology to effectively produce the desired products. These include improved technology for farming practices, food processing, packaging, postharvest handling, and labor-saving machineries (efficient automation). High physical losses -- 25-30 percent in the case of fish and 30-35 percent in

fruits and vegetables -- are quite common, resulting in high cost of raw materials and finished products.

Dizon (2013) contends that automation in food manufacturing is usually applicable only for big and reputable food companies. The MSMEs, which account for 99.6 percent of total establishments in the country, continue to rely on labor-intensive production and processing technologies.

The big corporations maintain their own product development unit to service their interests. On the other hand, the food manufacturing sector -- whether big or small scale -- can benefit from local scientists and engineers who come up with improved agricultural farming practices and appropriate farming technologies. State universities, government and private research institutions can also collaborate on addressing the technology concerns of the food manufacturing sector.

Food safety. Cases of food poisoning have been reported in media every now and then (RA 9296; GMA News TV 2008; Aurelio 2009). In some instances, a whole class in an elementary school having a birthday party or an entire village celebrating a wedding experienced severe vomiting and stomach ache due to food poisoning. Such incidents have happened not only in the rural areas but in urban areas as well. Likewise, there have been recalls of both local and imported food products. The seafood products sub-sector has reported also cases of rejection of Philippine exported products primarily due to adulteration, pathogens contamination and presence of filth, high moisture content, spoilage, and high level of carbon monoxide in vacuum-packed frozen smoked tuna steaks. Table 2 presents a number of issues and concerns on food safety, food quality, and postharvest processing and handling of seafood products in recent years (Tayamen and Ragaza 2012).

The above cases are alarming because they indicate a lack of strict adherence by the food sector to food safety standards and regulations, despite the Philippines' agreeing to the Hazard Analysis Critical Control Point (HACCP as cited by Abanto 2012) and issuance of Administrative Order 153 (AO 153 2004), which revises the guidelines of Good Manufacturing Practices (GMP).

Table 2. Issues and concerns affecting fishery products for export.

Processed Product	Issue/Concern	
	Safety	Quality
Fresh/chilled/frozen <ul style="list-style-type: none"> • Tuna • Shrimp • Squid and cuttlefish • Octopus • Crab and crab fat • Grouper • Black tiger prawn • Scallop 	<ul style="list-style-type: none"> • Contamination with pathogens, biotoxins, chemical, parasites • Microbial growth • Detected high levels of histamine in tuna (EU-RASFF 2008) • Detected antibiotic residue 	<ul style="list-style-type: none"> • Poor handling (handling chain) • Improper ice/fish ratio • Poor raw material entering processing plants • High moisture content (cephalopods)
Smoked Products <ul style="list-style-type: none"> • Tuna • Round scad 	<ul style="list-style-type: none"> • Contamination with pathogens and chemicals • Presence of parasites • Histamine • Microbial growth/chemical • High residual CO (tuna) • Growth of <i>C. botulinum</i> 	<ul style="list-style-type: none"> • Improper salt content (non-compliant to standard) • Poor raw material entering processing • Poor packaging and storage • Poor preservation • Presence of PAH
Dried Products <ul style="list-style-type: none"> • Shrimps and prawns • Squid and cuttlefish • Octopus • Sea cucumber • Seaweeds 	<ul style="list-style-type: none"> • Contamination with pathogens • Microbial/chemical growth molds • Presence of filth 	<ul style="list-style-type: none"> • Poor raw material entering processing plant • High moisture/salt content • Poor packaging materials/storage • Poor preservation
Prepared/preserved <ul style="list-style-type: none"> • Tuna • Shrimps and prawns • Crab meat and fat • Squid and cuttlefish 	<ul style="list-style-type: none"> • Mislabeling and adulteration • Contaminations originating from the environment • Presence of filth 	<ul style="list-style-type: none"> • Poor raw material entering processing • Improper handling of raw material • Poor packaging and storage

Source: Adapted from Tayaman and Ragaza (2012)

HACCP is a process control system that identifies where food safety hazards may occur in a food production process and puts in place stringent controls to prevent the hazards from occurring. AO 153, on the other hand, specifies the revised guidelines of GMP in all aspects of the industry, from organization, plant and equipment design to sanitation, warehousing and distribution. Both HACCP and AO 153 generally aim to strictly monitor and control each step of the process so that there is less chance for hazards to occur. By adhering to these protocols, the food business is able to assure consumers on the safety of the food products they produce.

While the big industry players adhere to sound HACCP and AO 153, their ability to detect or screen raw materials tainted with antibiotics or pesticide residues remains an issue. The micro- and small-scale and home-based food processing operations, on the other hand, are not regulated (Abanto 2012). For instance, there had been reports on the use of “botcha” or dead meat by some processors. It is alarming that most if not all processed products sold in sidewalks and markets belong to this category.

It is noted that no matter how strict the enforcement of food safety standards and sanitation as expressed in HACCP and AO 153, cases of food poisoning and product recalls will continue unless the consuming public do not assert their rights to safe and good quality foods. The public must protest violations and boycott unsafe products and brands. On the other hand, more support should be given to the enforcing agencies so that they will be more vigilant, such as the Food and Drug Administration (FDA), Department of Health (DOH), National Meat Inspection Services (NMIS), Bureau of Fisheries and Aquatic Resources (BFAR), and local government units (LGUs), which regulate slaughter houses for small-scale producers.

Aside from supply of raw materials, technology, and food safety, there is also the issue of the “competitive peso.” National Scientist Raul Fabella, in a number of fora, has expressed that there is now strong evidence that weak (or undervalued) currencies contribute to higher economic growth (2012, 2013). Ms. Clara R. Lopus, President of the Mamasita Foundation, Inc., sharing her experience at a NAST forum (2013), said, “An appreciating peso brings deleterious or disruptive effects on the competitiveness of Philippine produce. The present market-determined exchange rate policy was necessary when the peso was continually depreciating. Now with our huge international reserves, a deliberate and calibrated weakening of the peso is more suited to

gain competitive advantage. A case in point is the onion industry. When the exchange rate was PhP 55: USD 1, the Philippines was exporting onions to Japan. By 2005, when the peso started to appreciate, Philippine onions were undercut by China. All the time, the agriculture officials were only looking at the input cost of Philippine onion farmers. They have overlooked the effect of the appreciating peso vis-a-vis a controlled yuan. The Chinese yuan was perceived to be 20 percent undervalued while the peso was 10 percent overvalued. Together with the 10-20 percent peso appreciation, Chinese onions gained a price advantage of at least 40 percent.”

Recommendations

Given the current situation and the observed gaps, issues, and concerns, the following recommendations are put forward for consideration:

1. Small farm holdings should be consolidated for economy with scale. Moreover, the transfer of existing technologies to farmers should be improved. The agricultural success of Asian neighbors (e.g., Taiwan, Japan) has relied heavily on the effective transfer of advanced technologies from research institutions that developed them to farmers, resulting in massive application of such technologies. Such transfer is facilitated by the active participation of their highly-disciplined and entrepreneurial farmers as well as the sincerity, support, and strong political will of the government.
2. Strong collaborations must be forged among government institutions and private business sector, with their corresponding roles as follows (Santos 2004 as cited by Palabyab 2013):
 - a) Government
 - Establish a local standard comparable to the export market
 - Liaise on behalf of the exporter with importing government
 - Establish a database of relevant international laws, agreements, etc.
 - Issue pertinent documents
 - Regularly inspect producers’ facilities
 - Continue searching for new technology and provide technical assistance to producers

- Arrange exchange programs, study trips, international meetings, formal training

b) Private Sector

- Follow all standards and requirements of importing country and local governing body
- Implement quality standard systems and gain international accreditation
- Take the initiative for continuous improvement
- Research and know the market
- Establish close communication with government sectors concerned
- Unite and form an organization to negotiate, win concessions, upgrade standards
- Never sacrifice quality for cost, convenience or position; never corrupt or threaten government inspectors

Regarding science and technology, both government and private sector should identify and prioritize the problem areas of the industry where science and technology can be harnessed to an advantage. They should come up with prioritized road maps for important commodities and update the Industry Strategic Plans (ISP) prepared by NAST and partners and those prepared by DTI, which are excellent examples to start the chain reaction for development.

3. Concerned agencies (e.g., FDA, DOH, Department of Trade and Industry, LGUs) should strictly enforce the food safety regulations. They should require both big and small players in the industry to strictly adhere to sound HACCP and GMP systems. Through massive campaigns, they should encourage consumers to report food companies that violate safety and quality standards of manufactured food products. Consumers may even boycott unsafe or inferior products.
4. Industry partners should provide research and scholarship funds to supplement the meager funds allocated by government for the training of new crop/animal/food scientists and extension workers. The funds could also be used to support the continuing education of both big and small players through hands-on training and seminars to

improve the quality of food products. These can also be used to support research toward the development of new products/innovations particularly to assist the small players who are not capable of establishing their own product development unit.

5. Use science and technology, and economics in promulgating investments-friendly policies to attract both local and foreign investments.

Concluding Remarks

The above discussion underscores the great potentials of the food manufacturing sector to contribute to the country's economy. There is much room for growth and expansion, especially with the changing lifestyle and diets of various consumer groups in the local and global market as well as new technologies on food processing.

On the other hand, there is also greater demand and expectation for safe and quality products. The Philippines has committed itself to various international agreements and protocols that ensure safe and quality food. Adherence to these is non-negotiable if the country is serious in its goal for Philippine products to break into the world market. It is likewise non-negotiable for products made available for local consumers, whether these are produced by big industry players or by MSMEs. It is highly beneficial for the latter to consolidate themselves for economy of scale in terms of procuring inputs, putting in place facilities and processes to ensure products that are up to standards, and marketing.

In all of these, government is expected to play its role of facilitating businesses and enforcing safety and quality standards.

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