

Is Ghana Making Progress in Agro-Processing?

Evidence from an Inventory of Processed Food Products in Retail Shops in Accra

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TABLE OF CONTENTS

Abstract	1
Introduction	1
Background	2
Methodology.....	3
Results	5
Descriptive Findings.....	5
Analyzing Ghana’s Competitiveness Opportunities in Food Processing.....	7
Packaging	8
Policy Issues and Areas for Further Research	9
Concluding Remarks.....	11
References.....	11

LIST OF TABLES

Table 1—Processed food product categories.....	4
Table 2—Number of brands of processed foods, by processed food product category	6
Table 3—Top ten sources of imported processed food products.....	6
Table 4—Percentage share of local/imported products by type of retail outlet, by processed food product category	7
Table 5—Ghana’s competitiveness opportunities in processing, by processed food product category	7
Table 6—Imported products packaged in Ghana	9

LIST OF FIGURES

Figure 1—Map of Accra showing study areas	5
Figure 2—Packaging for selected domestically-manufactured product types.....	9

ABSTRACT

One likely outcome of Ghana's rising household incomes and increasing urbanization is a higher demand for processed foods. The question remains whether this expected higher demand will generate opportunities for growth in domestic agro-processing. This study assesses the performance of the agro-processing sector in Ghana through an inventory of processed and packaged food items in retail shops around Accra. The inventory shows:

1. The agro-processing subsector offers opportunities for domestic firms, with Ghanaian brands accounting for 27 percent of the items identified.
2. In addition to forming nearly a third of products identified, locally-processed products have penetrated diverse market segments with sales across a variety of retail outlets.
3. Regional imports of processed and packaged food items are low. Excluding South African brands, which accounted for 7.8 percent of imports, only 4.3 percent of the items were imported from other African countries.
4. Domestic agro-processors provided the highest share of products among processed starches and cereals, while imports dominate processed dairy, fruits, vegetables, and meat products.

INTRODUCTION

For decades, Ghana's policymakers and development experts have sought to promote agro-processing as a means of transforming the country's agriculture-based economy into an industrial powerhouse. Agro-processing is expected to expand produce markets for farmers, increase value addition for agriculture and create employment in both agriculture and industry. As the country rapidly urbanizes, increasing demand for processed foods is expected to serve as a motivation for growth in food processing that will add value to agricultural products and offer opportunities for increased employment. A strengthened agro-processing sector with strong agriculture-industry linkages is one of the key goals of the second phase of Ghana's Shared Growth and Development Agenda (GSGDA II) for 2014-2017 (NDPC 2014)¹.

Increasing consumer demand may increase opportunities for processing plantains, cereals, meat, dairy, fruits, and vegetables. Already, items such as processed cereals and fish are among the ten highest ranked products in the expenditure shares of urban households, and manufactured foods are consumed by 92 percent of urban households². Increasing urbanization may provide further opportunities for the agro-processing sector to increase consumption of these products by presenting them in packaged formats that are more convenient for urban customers. The question remains whether these opportunities are being met by local entrepreneurs or, alternatively, mainly through imports due to lack of competitiveness in the local processing sector. The government's stated goal is to provide a policy environment that enables domestic firms to take advantage of emerging market opportunities, such as for processed foods. However, crafting and executing the appropriate policies will require evidence on the current performance and competitiveness of Ghana's budding agro-processing sector.

This paper summarizes the findings of a first step toward enhancing understanding of the state of domestic agro-processing, through an inventory of processed foods available in retail markets in Ghana's administrative and commercial capital, Accra³. The study analyzes the participation of local manufacturers and brands in this market and identifies some promising areas for domestic firms by analyzing Ghana's competitive advantages in production. The paper is structured as follows. The next section provides a background for the study, followed by

¹ This is a long-standing policy goal. The first phase of the GSGDA 2010-2013 (NDPC 2010) emphasized the need to accelerate manufacturing by linking agriculture and industry.

² From authors' analysis of data from the Ghana Living Standards Survey 2012/2013 (GLSS 6).

³ Accra has a population of 2.34 million (authors' calculations, based on 2010 census figures from the Ghana Statistical Service available at http://www.statsghana.gov.gh/docfiles/pop_by_region_district_age_groups_and_sex_2010.pdf). It is considered to be one of the potential mega-cities in Africa, along with other cities such as Cape Town, Dar es Salaam, Lagos, Nairobi, and Johannesburg (sources: Ghana Statistical Service 2010, <http://www.megacities-africa.com/>; <http://www.blog.kpmgafrica.com/africas-7-megacities-the-catalysts/>).

a description of the methodology used. The Results section is broken down into three sub-sections: a summary of the main descriptive findings from the field inventory, an assessment of Ghana's competitive advantages in production, and a sub-section on packaging. The penultimate section is a description of a future research agenda given the policy context. Finally, concluding remarks end the paper.

BACKGROUND

The conduct and transformation of agro-processing in developing countries is a relatively under-researched topic (Reardon 2015), although some recent publications have now shed light on the transformations taking place in countries in Asia and Eastern and Southern Africa (Reardon et al. 2014; Snyder et al. 2015; Tschirley et al. 2015a). Agro-processing will become a more pressing topic as developing countries urbanize rapidly and gain more sizeable middle-class populations. Although consumption of processed foods rises with household incomes, recent studies show a shift towards processed foods even among lower-income groups (Tschirley et al. 2015b). Urbanization and income growth in developing countries are expected to drive demand for meat, fruits and vegetables, processed foods and demand for feed ingredients such as soybean, maize, and fishmeal (Regmi and Dyck 2001; Reardon et al. 2015; Tschirley et al. 2015b). The link between urbanization and demand for processed products is likely due to the time constraints that most urban residents face, making it difficult for them to spend as much time on food preparation as rural residents do.

Ghana has experienced significant income growth and urbanization, making it a likely candidate for the associated changes in consumer demand for processed foods. Ghana's economy has experienced positive growth for decades—the country attained a lower middle income status in 2006. Per capita nominal gross domestic product (GDP) increased from about US\$1,100 in 2009 to more than US\$1,400 in 2014, despite a negative growth rate in 2014⁴. This performance is reflected in significant poverty reduction since late 1980s, with the poverty head count index falling from 52 percent in 1992, to 29 percent in 2006, to 24 percent in 2012⁵. Ghana's urban population is estimated at 53 percent of the total population with an annual growth rate of 3.4 percent (United Nations 2014).

Despite positive growth trends in Ghana's agricultural GDP, there is a weak link between agriculture and industry. The manufacturing sector overall has grown by only around 2 percent annually from 2006-2013, and the share of manufacturing declined over the same period from around 10 percent of GDP to 5.8 percent (Nti 2015). Although food and beverage processing represents the highest share of manufacturing at 30 percent, the value added by the manufacturing sector continues to decline with little linkage to domestic raw material production, especially from agriculture. This limits further economic growth and transformation of the agricultural sector. Increased agro-processing in response to shifting consumption patterns as a result of urbanization and income growth can strengthen the link between manufacturing and agriculture.

The formal food processing sector emerged in post-independence Ghana under a policy of industrialization through import substitution. The era saw a push for manufacturing through public investment in small, medium, and large industries, supported by the justification that there was limited experience and weak capacity in manufacturing in the private sector. The state established vegetable oil mills and fruit and vegetable canneries; this gave birth to state-run firms such as the Ghana Industrial Holding Company. The performance of these state-owned industries soon declined because of high costs of production, low competitiveness against imports, and mismanagement (Anaman and Osei-Amponsah 2009). Subsequently, Ghana's agro-industry sector has been described as having low value addition involving semi-processing with low technology at the cottage industry level, with few large-scale industries (Aryeetey and Mensah 2008; Quartey and Darkwah 2015).

The past decade has seen an emergence of private sector enterprises specializing in food processing, but there is still room for improving the food processing industry. For example, although maize is consumed across

⁴ Source: World Bank, 2015 (Accessed at <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD/countries/GH?display=graph>, October 6, 2015).

⁵ Sources: Authors' summary of Ghana Statistical Service (GSS) and GLSS II – GLSS IV poverty trends.

the country, most of it is purchased as raw grain and processed at small-scale mills—only an estimated 10 percent of maize is processed by medium or large firms (World Bank 2012). The modern sector includes a growing number of formal medium to large enterprises. Small to medium scale enterprises are also emerging from the traditional sector. The small to medium enterprises constitute about 70 percent of agro-food processing in Ghana (Owusu-Kwarteng 2014). Products include maize, cassava, plantain flours, pre-mixed and blended cereal flours, and plantain chips. Food processing is carried out at household level or in small to medium size plants, and distributed in shops. However the domestic market for packaged foods is difficult to penetrate for local manufacturers because of dominance by multinational brands. There are a few medium and large industries in Ghana focusing on regional and international markets, but there is no formal organizational structure for domestic food marketing and distribution.

More recently, there has been some research and development for agro-processing and the emergence of new value-added food products. The Food Research Institute (FRI) has led research on transforming traditional food products and developed technologies and products, such as fish smoking equipment, grain flour blends, and weaning foods. At the same time, development projects have supported capacity building through training, transfer of knowledge to small and medium enterprises, quality assurance through establishment of laboratories and their accreditation, and development of analytical protocols (Owusu-Kwarteng 2014). Also notable are developments in cassava processing, such as grating machines and hydraulic presses for dewatering. Availability of mills has also facilitated processing of spices, such as red pepper, while vegetable oil production has benefited from the introduction of mechanized presses for palm oil and shea butter. The technologies are often introduced to support women's income generation and are supported by development projects. For example, the Village Infrastructure Project has supported women's groups in Northern Ghana with shea processing equipment. While these agro-processing projects and initiatives have become ubiquitous, it is not yet clear whether the technologies can attain adequate scale and be adopted on a broad scale by medium-scale processing firms.

In spite of these recent developments, the domestic food processing industry still needs innovation and technical research for product development, access to finance, improved knowledge of good manufacturing practices, and wider involvement with and organization of the informal food processing sector. Challenges of the agro-industry sector include limited technical capacity and policy support to respond to global developments, lack of inter-firm cooperation to address challenges (Whitfield 2010), lack of coordinated industry investment (Anaman and Osei-Amponsah 2009), and the dominance of multinational companies (World Bank 2012). In general, the expected growth and development of small-scale food industries in West African countries has been hampered by the use of inefficient and inappropriate technologies, poor management, inadequate working capital, limited access to banks and other financial institutions, high interest rates, and low profit margins (Büntrup et al. 2015; Aworh 2008). In addition, the informal nature of most of the small enterprises engaged in food processing poses challenges for knowledge transfer, quality control and surveillance for enforcement of standards.

METHODOLOGY

The study followed the approach used by Snyder et al. (2015) and Ijumba et al. (2015). We classified food products under seven pre-determined categories (Table 1). The groups included starches and cereals, on the basis of high frequency of their consumption by urban households⁶ and food groups such as dairy, meat, and fruits and vegetables, for which high income elasticities have been observed in other developing countries. We used a structured questionnaire to collect information on processed food product name, brand, manufacturer, manufacturer's location, and main ingredients.

⁶ This is based on authors' analysis of data from the Ghana Living Standards Surveys 2005/2006 (GLSS 5) and 2012/2013 (GLSS 6).

Table 1—Processed food product categories

Category:	Starches	Cereals & legumes	Dairy and cocoa products	Fruits and vegetables	Meats and fish	Oils and fats	Spices
Examples of typical products:	Plantain and cassava chips, Potato chips	Milled rice, Maize flours, Sorghum flour	Milk, Yoghurt, Cheese, Cocoa, Chocolate spreads	Chopped vegetables, Fruit juices, Dried fruits and vegetables	Canned fish and meat	Vegetable cooking oils, Margarine, Butter	Spice powders, Ginger, Peppers, Mixed spices

Source: Authors' classifications.

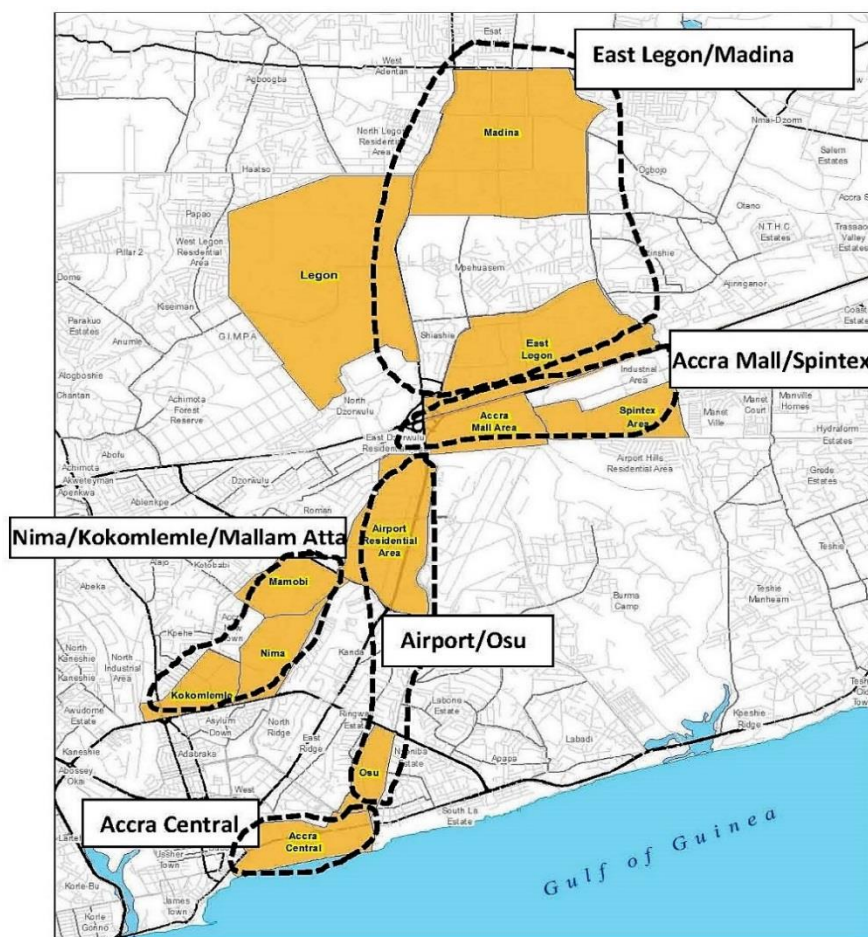
Based on earlier field work, we defined six types of shops, ranging from small kiosks to supermarkets. Selection of shops was purposive so as to include retail shops of all sizes.

- *Kiosk*: The smallest retail outlet, this type of shop is commonly found in residential areas and along streets. They are run as informal household enterprises.
- *Open-air market stall*: These retail outlets are run from stands erected in the open or in sheds provided by local authorities in market facilities, operating as household or individual informal businesses.
- *Container shop*: These informal household enterprises are housed inside shipping container and can be relocated easily.
- *Small shop*: Well-constructed shop building, usually as part of a residence. Generally involve a sole proprietor and may be informal or formal in terms of operations.
- *Local supermarket chain*: Supermarket without links to an international franchise.
- *International supermarket chain*: Supermarket established by an international franchise. Customers in both types of supermarkets tend to be middle to upper income consumers. Non-Ghanaians in particular tend to patronize the international supermarkets.

There was no formal sampling of the shops in the study. Those included in the study were chosen based on the willingness of shop owners and managers to participate in the survey.

Survey teams visited shops in five of the main commercial areas of Accra (Figure 1). The areas represent shopping centers for lower, middle, and upper income residential neighborhoods as well as open markets, which tend to be common shopping areas that draw customers from all over the city. The commercial areas can be briefly characterized as follows: Shops in East Legon/Madina serve a mix of customers from all income categories, Accra Mall/Spintex and Airport/Osu serve upper-income residential areas, Nima/Kokomlemlle/Mallam Atta is the area most likely to be dominated by lower- and middle-income customers, and Accra Central is the commercial heart of the city, drawing customers from all income categories, but predominantly lower and middle-income. Survey teams were assigned to each of the five areas. To ensure adequate coverage within each type of shop, each team started its inventory from a different type of shop and aimed to collect full information on products within each category from that shop type. The survey teams visited the different types of shops within each area and continued identifying products until the availability of new products was no longer obvious. Following this process, the teams had visited 98 retail shops by the end of the survey.

Figure 1—Map of Accra showing study areas



Source: Authors/Survey Department of Ghana.

RESULTS

Descriptive Findings

Range of Processed Foods: A large variety of processed foods are retailed across all the different types of outlets, suggesting that there is a high demand for these products in Ghana’s urban centers. We identified 1,779 products⁷. Following the terminology used by Snyder et al. (2015), each product represents both a product type (e.g., packaged rice) and a brand. Thus for each product type there could be several brands and therefore several products. Within the defined categories we identified 148 product types. For some product types, an extensive assortment of brands is now available – we found more than 100 brands of white rice, for example.

Domestic Production vs. Imports: Local food manufacturing seems to have grown in recent years, with new products entering the market. Although there is intense competition from imports, 27 percent of the products were manufactured in Ghana (Table 2), and a sizeable number of Ghanaian products were found in all types of retail outlets. Ghanaian firms dominate in the production of starchy staple products, using cassava and plantain to turn out products such as *fufu*⁸ flours, plantain chips, and *gari*⁹. About a third of processed cereals, dairy, and cocoa products were made in Ghana.

⁷ Recent inventories in Tanzania reported 460 products in Dar es Salaam and about 950 products in Dar es Salaam, Arusha, and Mwanza (Ijumba et al. 2015; Snyder et al. 2015). The inventories in Tanzania covered five product categories—maize and other flour products, packaged rice, dairy, fruit juices, and poultry—compared to the broader categories used in this study.

⁸ *Fufu* is a starchy staple made from boiled and pounded tubers such as cassava, plantain, and yam. Processed *fufu* flour consists of smooth milled tubers that can be boiled and used to prepare *fufu* without pounding.

⁹ *Gari* is a ready-to-eat meal made from cassava that is grated, fermented, and fried.

Table 2—Number of brands of processed foods, by processed food product category

Processed food product category	Number of brands	Mean number of brands per product	Products made in Ghana	Main ingredients	Ghanaian brands (% of total)
Starchy staples	59	5	Fufu flours, <i>Gari</i>	Cassava, plantain	51
Processed cereals	660	13	Rice, <i>Tom Brown</i> ¹⁰ , maize flour	Rice, maize	30
Dairy and cocoa	171	19	Cocoa beverages	Cocoa, milk	31
Fruits and vegetables	285	22	Juices, chopped fruits & vegetables	Assorted fruits & vegetables	20
Meats and fish	215	15	Canned fish	Mackerel, tuna, sardines	17
Oils and fats	188	12	Palm oil	Palm oil	13
Spices	201	6	Spices, seasoning mixes	Peppers	37
Total	1,779	12			27

Source: Authors' computations based on survey data.

Sources of Imports: The survey recorded a total of 1,298 products imported from 64 countries. The highest share of imported products, judging from the number of brands alone, were from the United States, accounting for 11.5 percent of the imported items (Table 3). The United Kingdom, South Africa, and China followed, making up 9.3, 7.8, and 6.9 percent of imported items, respectively.

Table 3—Top ten sources of imported processed food products

Country	Number of products	Share of imported products (%)	Examples of imported products
United States	150	11.5	Assorted spices and seasoning mixes, corn grits, fruit juice
United Kingdom	122	9.3	Fruit juice, chopped and packaged fruit and vegetables, biscuits
South Africa	102	7.8	Biscuits, fruit juice, chopped and packaged fruit and vegetables
China	90	6.9	Canned fish, tomato paste/puree, biscuits
Lebanon	73	5.6	Chopped/package fruit and vegetables, fruit juice, tomato paste/puree
France	71	5.4	Milk, chopped and packaged fruit and vegetables, biscuits
Thailand	71	5.4	Rice, canned fish, sweet corn
Netherlands	62	4.7	Canned fish, canned meat, margarine
Italy	55	4.2	Spaghetti/noodles, tomato paste, chopped and packaged fruit and vegetables
United Arab Emirates	46	3.5	Rice, milk powder, canned beef

Source: Authors' computations based on survey data.

Note: In this ranking the next set of countries, with import shares above 2 percent, were India, Belgium, Indonesia, Vietnam, and Germany.

Regional Imports: Surprisingly, brands from countries in Africa south of the Sahara do not seem to have penetrated the Ghanaian market, with the exception of South Africa, which represented 7.8 percent of imported products. Imports from the entire West African sub-region accounted for only 2.5 percent of imports, while imports from all other African countries amounted to only 1.8 percent. For starchy staples, with the exception of items imported from South Africa, there were no products from African countries.

Product Types: In our food categories, cereals & legumes and spices have the largest number of products with shares of 33 and 23 percent, respectively. The product categories with the highest diversity of brands (defined as number of brands per product) are fruits and vegetables (22 brands), and dairy and cocoa products (19 brands).

Retailing: The distribution of products in each type of retail outlet is shown in Table 4. In international supermarkets, imports constitute between 72 and 93 percent of processed products. As would be expected, this share is generally higher than the share of imported products found in the other types of shops. In local supermarkets, local products dominate in the starchy staples category, as is the case for the smaller shops. However, in all of the other food categories, imported products constitute 60 to 83 percent of products in local supermarkets. About

¹⁰ *Tom Brown* is a roasted maize flour used to prepare porridge.

a third of the processed cereals and about half of dairy and cocoa products sold in smaller shops are produced by domestic firms. The small shops carry predominantly imported meat and fish products and oils.

Table 4—Percentage share of local/imported products by type of retail outlet, by processed food product category

Processed food product category	Small shop	Container shop	Kiosk	Open-air market store	Local supermarket chain	International supermarket chain
	Local/ Imported	Local/ Imported	Local/ Imported	Local/Imported	Local/Imported	Local/Imported
Starchy staples	62/38	-/-	-/-	100/-	67/33	28/72
Processed cereals	35/65	35/65	50/50	43/57	40/60	18/82
Dairy and cocoa	48/52	50/50	50/50	75/25	24/76	18/83
Fruits and vegetables	19/81	57/43	50/50	48/52	17/83	12/88
Meats and fish	13/87	7/93	-/100	29/71	30/70	10/90
Oils and fats	13/87	-/100	20/80	13/87	24/76	7/93
Spices	45/55	33/67	40/60	42/58	49/51	16/84
Total	29/71	30/70	38/62	42/58	33/67	15/85

Source: Authors' computations based on survey data.

Analyzing Ghana's Competitiveness Opportunities in Food Processing

If a type of product is produced in Ghana and is also imported, Ghanaian producers may be competitive if the raw ingredients are produced in Ghana. Thus, we consider that Ghanaian producers of cassava- and plantain-based products have a competitive advantage, along with producers of cereal-based flour blends for Ghanaian porridges and spice mixes from local spices. However, even though Ghanaian enterprises produce some milk products, in this classification, domestic firms do not have a competitive advantage because of the undeveloped local dairy industry. For products that are only packaged in Ghana, domestic firms may have a competitive advantage, but they still lack the necessary linkages to the farm sector to generate agricultural growth and employment.

Table 5—Ghana's competitiveness opportunities in processing, by processed food product category

Product Category	Number of product types made in Ghana only	Number of product types imported only	Number of product types made in Ghana and imported		Share of product types made in Ghana, %
			Local	Imported	
Starchy staples	27	24	3	5	51
Processed cereals and legumes	57	51	142	410	30
Dairy and cocoa products	0	14	53	104	31
Fruits and vegetables	3	7	54	221	20
Meats and fish	7	37	30	141	17
Oils and fats	3	30	21	134	13
Spices	8	31	66	96	37

Source: Authors' computations.

Table 5 shows categories of processed product types based on the level of competitiveness. Ghana has a competitive advantage in producing products from starchy staples (*gari*, *fufu* flour, plantain or cocoyam chips, and *kokonte*¹¹ flour). This is welcome news on two fronts. First, the transformation of cassava and plantain is essential in reducing post-harvest losses. The processed products have much longer shelf-life than the raw material, which makes it possible for farmers to stabilize farm incomes by spreading their sales. Secondly, as processing technologies are traditional and labor-intensive, expansion of processing of starchy staples can increase employment. One would expect that demand for processed starchy staple products will grow with increasing population and urbanization.

¹¹ *Kokonte* is a meal consisting of fermented, pounded cassava. *Kokonte* flour is made from milled cassava chips that can be used to prepare the meal without pounding.

Spice products have the second highest share (37 percent) of product types made in Ghana, indicating promising opportunities for domestic firms engaged in processing spices (Table 5). Demand for spices can be expected to grow with population, income, and urbanization. Employment potential in spice processing is high, and may provide opportunities for female entrepreneurs, because processing methods (such as sun-drying, pounding, or milling) have traditionally been carried out by women. Packaging is also likely to be done manually for the foreseeable future. However, for processing of spices to be competitive (given that there are alternatives available from imports) the processing technologies will need to be upgraded. Upgrading the technology will also help to ensure quality and food safety, especially during drying.

Processed cereals (maize, sorghum, millet) are ingredients in popular Ghanaian staple foods. The potential demand for well-packaged quality flour is therefore high and can be expected to grow with income and urbanization. Processing methods are labor-intensive and the final quality can be adversely affected by improper drying. To realize the high demand potential, processing methods should be upgraded to safeguard product quality.

Ghanaian producers of fruit and vegetable products have a share of 20 percent of the product types, possibly because of the undeveloped horticulture sector. The need for cold chains in the distribution of chopped fruits and vegetables is a challenge, although it offers a good opportunity for local processors to be competitive against imports of these products. The production of exotic vegetables (cabbage, lettuce, cauliflower) is already widespread in cities and peri-urban areas, and increased production at both farm and processing levels can generate on- and off-farm employment.

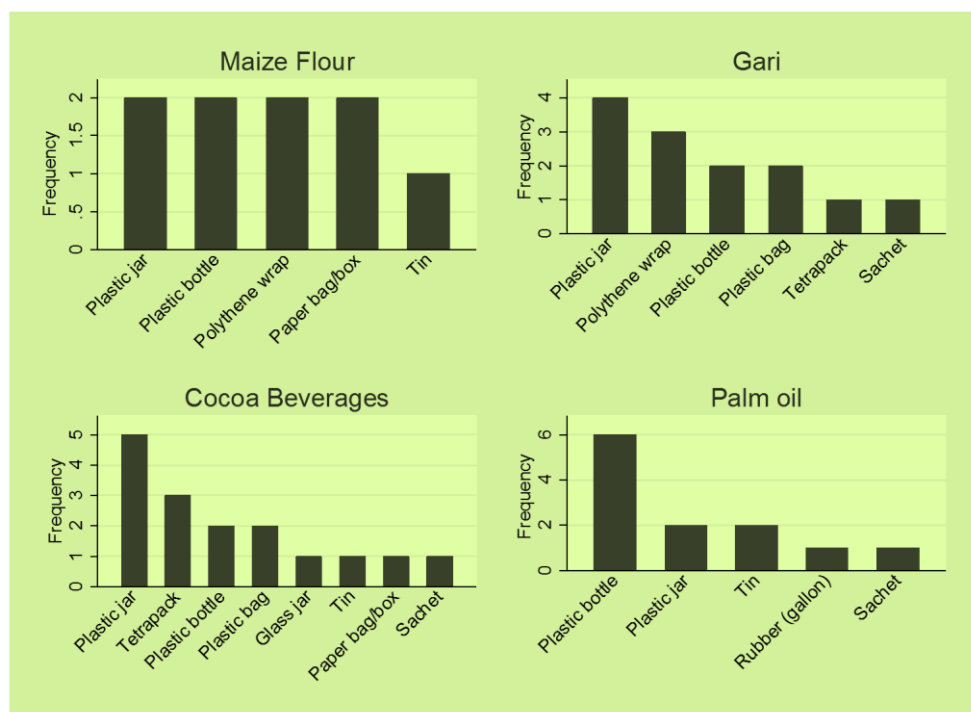
Some imported products identified during the survey were likely manufactured primarily for Ghanaian consumers—for example, we found *fufu* flours imported from the United States, yam flour imported from the United Kingdom, and *shito*¹² imported from Italy and South Africa. Given the transportation and transaction costs of moving these items from the production points into retail outlets in Ghana, one would expect that these products were produced with Ghanaian consumers living in the country of export in mind. If so, then while the existence of these imports may be a potential threat to the market share of Ghanaian firms, they also suggest that there is a market for processed food items outside Ghana that can be explored by Ghanaian firms.

Packaging

Agro-processing generates employment in ancillary sectors, such as packaging and services. As a first step in assessing the potential for growth in these ancillary sectors, the team observed the packaging on processed items during the survey. Locally produced items were packaged in a variety of ways, suggesting potential for diversity and growth in this area. Figure 2 shows the distribution of packaging used for selected locally-produced items. In addition to the items depicted, the teams observed products presented in a variety of packaging materials, including various types of plastic, cardboard and other paper materials, tin cans, and glass bottles and jars. Products are also packaged in a variety of sizes; for example, rice is sold in 50, 25, 5, and 1 kg packets, while vegetable cooking oil comes in 4-litre and 1-litre containers.

¹² *Shito* is a spicy sauce made from peppers, oil, and dried fish.

Figure 2—Packaging for selected domestically-manufactured product types



Source: Authors computations based on survey data.

The inventory also revealed a range of products that were described as imported but repackaged in Ghana. Examples are fruit juices, tomato paste, milk, and polished rice (Table 6). Re-packaging imported produce in Ghanaian factories suggests that Ghanaian firms can be competitive in post-processing steps, such as storage of processed products, weighing, and dividing products into packaged forms. However, there is high demand for the primary products, which is not met by local production.

Table 6—Imported products packaged in Ghana

Processed product	Product Type	Number of brands
Processed cereals	Rice	17
	Biscuits	4
	Maize cereal	1
Packaged fruits and vegetables	Tomato puree or paste	3
	Fruit juice	1
Processed meat or fish	Canned fish	15
Oils and fats	Margarine	2
Spices	Assorted spice and seasoning mixes	3

Source: Authors computations based on survey data.

POLICY ISSUES AND AREAS FOR FURTHER RESEARCH

In future research we will address questions around the linkages between farmers, processors, and the logistics and packaging industries; factors determining the success of domestic firms; and job creation that is generated by growth in food processing. In related work, we will also examine the dynamics of changing consumer behavior and market opportunities. The overall goal of this work program is to identify policies that will strengthen domestic

agro-processing in line with the government of Ghana's stated goal of providing an enabling environment for private sector to lead in transforming agriculture.

The nature of linkages between farmers and processors includes reliability of supplies and productivity of the farms where processors obtain raw produce, types of contracts between farmers and processors, and procurement processes. This information will help in understanding the extent to which agricultural productivity and procurement processes foster agriculture-industry linkages and the sustainability of the processing enterprises. A study of farmers' access to research and extension will also help to assess long-term development and competitiveness.

Our examination of the factors leading to success or failure of domestic agro-processing firms will include assessments of the structure of the enterprises, including managerial practices, and their operating conditions. A case study approach will be used to review strategies adopted by small-scale processors for identifying and developing products and understanding their markets. This study component will examine the choice and sources of technologies, costs of access, patenting, certification, investment requirements, and access to capital. We will also study production practices and strategies used for marketing and distributing products. A study of practices will also reveal any quality and food safety issues.

Related studies of demand will aim at measuring the size of potential markets for domestically-produced and domestically-consumed products, such as *fufu* flour, the income-elasticity of demand for such products, and the potential for market development. We will also study whether these products are suitable for modern manufacturing and the level of competition from imports that they face. For domestically-produced products that face intense import competition, future research will examine whether market segmentation due to different types of consumers, e.g., by income level and rural and urban location, may still provide market opportunities for local manufacturers. If such opportunities do exist for differentiating consumers, the ensuing policy question would be to identify possible policy support to help such manufactures to develop.

To inform the government's policy goals, future research would have to realistically identify a subset of imported products that could offer import substitution opportunities. Importing such products for which local raw materials are produced by farmers is often a concern for government, since such imports adversely affect the demand for agricultural raw materials when similar processed products are imported and consumers shift to them. For other products, due to lack of local raw material production, Ghana has an absolute disadvantage in processing them. Identifying such products can help to understand areas where government policies to promote such products would not be beneficial, and whether importation of such products will become a rising trend (income effect), which may crowd out demand for other products.

Besides manufacturing of processed food, trade and the logistics of moving these products to meet market demand will be important to consider when thinking about job creation, given that the majority of nonfarm jobs are actually in trade services and are often in informal sector. In a recent paper, Tschirley et al. (2015b) show how changes in diet changes are expected to drive structural changes in youth employment in East and Southern Africa, concluding that there will be a general decline in the share of populations engaged in farming. In Ghana, one would expect that growth in food manufacturing will contribute to ongoing social and economic transformations, such as rural-urban migration and declines in the share of population engaged in agriculture. Understanding changes in the trade and logistics of food products will contribute to our understanding of the linkages between food processing and labor markets, both on- and off-farm. Future research in this area will also consider different trading and retailing systems and compare the effectiveness of different modes of value chain development. Value-addition, in this conception of the term, would move beyond processing alone to include post-processing activities, such as packaging and marketing.

CONCLUDING REMARKS

This analysis of the performance of Ghana's agro-processing industry through the lens of an inventory of processed food items available in retail outlets shows that Ghanaian firms are responding to changing consumption patterns brought about by increasing incomes and urbanization. There is increased access to such foods for consumers who, for quality or food safety reasons, prefer to procure processed food products from shops rather than in the open market or along streets. The budding agro-processing sector is contributing to strengthening value chains of agricultural raw materials, and, depending on how primary products are obtained, firms involved in processing and packaging can link smallholder farmers to higher value markets.

While imported products still dominate the stock in some shops, especially international supermarkets, domestic producers can be competitive in processing food products in the starchy staples and cereals and legumes categories. At 27 percent, the share of Ghanaian brands among processed food products available in shops in Accra is low but impressive given the competition from diverse countries exporting food products to Ghana. The variety of brands for local products, such as plantain chips, spices and maize-based products, suggests that there are areas with potential for expanded production of high-value products, especially based on cassava and maize.

The demand for processed foods can be expected to grow along with population, income, and urbanization. While processing appears to be primarily at small scales, the agro-processing sector is in a good position to generate employment because of the labor-intensive processing methods used in small-scale industries. However, Ghana's policy goal of achieving sustainable growth in food processing will depend on increased and competitive production of raw produce, better processing technology to enhance product quality and safety, and higher productivity, starting from the farm, to ensure competitiveness against imports of processed food products.

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