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SCIENTIFIC PAPERS

POULTRY SECTOR ANALYSIS IN ALBANIA

Dejsi Qorri

University of Debrecen,Faculty of Economics, Department of Regional development and Rural Development,

dejsimargaret@gmail.com

Abstract: *Meat production, in specific poultry meat is a very important product for protein and nutrition values for many consumers. With the urbanization of the population people's diet is shifting towards meat overall, including processed poultry. This has increased the challenges of quality and control over the meat products. (RAIHAN AND MAHMUD, 2018) In general, poultry remains a problematic sector in Albania, with the most common issue being the quality and not the European Union standards and regulations. This paper analysis the egg and poultry products livestock and productions, importing and exporting trends on poultry products, and the potential of development of this sector in the single market of European Union by improving the sector. This study gives an overview in poultry subsector related to livestock and production, international trades, and their market trends. It highlights the supply chain in poultry that can be helpful for poultry businesses and government. It also provides valuable information regarding the impact of quality issues in international market, also the structure of the market for poultry is conducted. Also, the imports and exports on poultry subsector trends and comparison was conducted. The study also consisted of calculations of index number CPI, which indicates the changes in consumer purchasing power.*

INTRODUCTION

The meat value chain is the most important value chain in Agriculture of Albania. With poultry being the fastest growing sector in the world with the largest consumption. Just like in the global market, this trend is also found in Albania. The main factor is the Albanian rising incomes of costumers, shifting their diet into meat products. Albanian females consume more chicken while Albanian males consume all type of meats. Younger generation tends to consume more poultry than the older generation. Customers buy poultry meat, based on appearance and texture. (GOGA, 2019)

The subsector itself, is facing lots of challenges related to quality and control issues. The potential market for poultry in Albania is the local market and international market. Nowadays, the poultry production in Albania has been focused on the local markets. One of the factors is the costs of transportation to the local markets are less than in international markets. The consumer behaviour toward poultry consumption is also similar with EU consumer behaviour related to poultry production. (DEVINE, 2003)

METHODOLOGY AND MATERIAL

This study consists of choices when mix methods of qualitative and quantitative analysis. The quantitative. For analysing the Livestock and live meat poultry production, secondary data was collected from INSTAT (Albanian Institute of Statistics). The data type was quantitative data and descriptive analysis was conducted. For importing and exporting, secondary data was used taken by FAOSTAT (for import and export of poultry products) and UNSTAT COMTRADE (for animal meat import). The data was analysis by mixed between descriptive analysis and trend analysis. (FREUND AND WILSON, 2003) Data gathered from other countries or regions were used for comparative analysis purposes. This study allows us to have a better understanding of poultry subsector value chain of Albania. Regarding the market structure of Albanian poultry sector and Control and quality issues in relation with EU, content analysis was used to analyse the qualitative data. Also, the Value chain of poultry was analysis with content analysis when a lot of qualitative data was gathered.

Index numbers

Data was collected from INSTAT (National Institute of Albania) and STATISTA (GDP/income per capita). The data time interval is from 2012 to 2021. Consumer Price Index for meat group based on 2012 chosen as the base year for comparison. The method used is Laspeyres with based year. (BOSKIN et al, 1998)

(1) (CPI study year / CPI base year) *100

(2) Deflation = (Income per capita / CPI base year) *100

Limitation in the paper

This paper as every paper has its limitations. The main issue is lack of statistical availability for meat processing in Albania. Also, there is no data related to processors, trading process, slaughtering, and leftovers.

POULTRY PRODUCTION IN ALBANIA

Poultry sector in Albania is characterised by small scale production and large-scale production: the poultry enterprises. Small scale are typically family farms in the backyard, also the intensive family poultry farms. Usually, the poultry livestock they grow are chickens, turkeys, ducks, geese, and pigeons. On the other hand, poultry enterprises are specialized in egg production and meat production. From which is mostly Chicken and Turkeys, common breeder is broilers.

Poultry production by regions

According of INSTAT statistics, poultry subsector had decreased in 2020 with 7.907.000 heads in comparison with 2019, with 8.179.000 heads. The total production of live meat in 2020 was 21.049 tonnes. The total poultry livestock units are 49.000 in 2020. Compared to other meat sectors, poultry sector dominates for number of livestock, followed by sheep/goats.

Chart 1: Number of heads and meat production for poultry in Albania

Source: INSAT, 2020, own edit.

But when it comes to the production the total production of live meat in 2020 was 21.049 tonnes. (INSTAT, 2020) The total poultry livestock units are 49.000 in 2020. Where Fier Region, is doing better in numbers than other regions in Albania related to the number of livestock and production for poultry, with the highest livestock units 22.000. On the other hand, the capital Tirana, has larger total livestock compared to Fier region but the production of live meat is significantly lower than Fier region. Berat and Tirana with 6000 livestock unit, Tirana shows production of meat live weight compared to Berat. (INSTAT, 2020)

Egg production by regions

Turkey chickens are common meat in Albania, according to INSTAT report for 2020, turkeys' number of heads was 5001217. While poultry production was 21000 tonnes. 861018 were the total egg production. From the Table 5, we can see that Durres region is the leader in egg production with 272500 million pieces, followed by Shkoder region with 99806 eggs. The regions who have the least contribution in egg production are Gjirokaster and Kukes region.

Table 1: Egg production

Prefecture	Million/pieces
Total of eggs	861.018
Berat	71.887
Dibër	35.130
Durrës	272.500
Elbasan	74.922
Fier	91.598
Gjirokastër	13.829
Korçë	39.394
Kukës	11.716
Lezhë	24.115
Shkodër	99.806
Tiranë	66.004
Vlorë	60.116

Source: INSTAT (2020), own edit

Exporting and importing trends for poultry in Albania

Imports for animal meet for 2000-2016, according to UN-STAT, for beef meat we can see a high increase from 2000 to 2005, and then decreasing trend in 2010. Also, in 2014 dramatically decreases for importing beef meat and followed by an increase in 2015. Decreasing again in 2016. Imports for pork meat, we can a different trend rather than the beef one. In the table 1, we can see from 2000 to 2005, the imports doubled for pork meat, then again 2010 we see the same trend, reaching 11.401 ton. Then in 2014, the pork meat imports decreased dramatically to 5.020 ton. These fluctuations continue for years 2015 and 2016. In relation to the chicken imports, we can see that it has similarities with pork import trends, we can see an increase trend for 2000, 2005 and 2010.

And then for years 2014, 2015 and 2016 the imports remain stable, with slightly increasing trend. We can see that the imports expenditures for beef, pork and chicken in 2016 is better than the years before.

Table 2: Import of main types of meat

Year	Beef (HS 0201 and 0202)		Pork (HS0203)		Chicken (HS0207)	
	Imports (000 $)	Imports (ton)	Imports (000 $)	Imports (ton)	Imports (000 $)	Imports (ton)
2000	1,195	1,250	6,475	8,444	6,475	8,444
2005	6,800	5,669	12,600	11,401	12,600	11,401
2010	5,796	2,558	19,943	10,352	19,943	10,352
2014	1,598	692	9,738	5,020	9,738	5,020
2015	2,205	1,029	10,932	5,847	10,932	5,847
2016	1,787	997	9,776	5,781	9,776	5,781

Source: UNSTAT (2018), SKRELI AND IMAMI, 2019

Table 3: Supply of poultry meat (000 ton)

Category	2005	2010	2015	2016
Production	4.4	17	17.3	19.7
Import	18.4	20.0	21.4	24.2
Export	:	:	:	0.003
Supply	22.8	37	38.7	43.9
Import/supply	80.7%	54.1%	55.3%	55.1%
Export/production	:	:	:	0.02%

Source: INSTAT (2018) for production,
UNSTAT (2018) for trade, SKRELI AND IMAMI, 2019

The production for supply of poultry meat has an increasing trend, from 2005 to 2016. The supply come only from Import activities, more than 55,1 %. While for export/ production is very low 0.02%.

RESULTS AND RECOMMENDATIONS

Poultry overall, is an important product in the Albanian consumer's diet. The poultry production goes for domestic markets. In comparison with beef and pork, Albanians prefer the chicken meat consumption, this is also shown in the table 2. A large quantity of poultry products Albania is imported. The imports come from Greece, Brazil, US, and Germany in relation with poultry meat in table 3. Albania has no power in exporting poultry meat to other countries. The factors like: quality issues, high cost of production, cheaper poultry products by other countries, issues with supply chain in relation with storage facilities, freezing, controlling etc. Also, the data in Chart 1, shows problems in productivity levels. Albania is characterised by a domination small-scale and family farming, making it difficult for commercial poultry. In a general look on the market, Albania has a big potential in neighbouring countries as target markets for exporting. But to compete with other countries Albania must be more efficient in processed products, relatively with poultry products. This limitation comes from low productivity in agriculture and agro-processing industries, also there is lack of facilities for processing products, and the last is high costs and low quality. These limitations, exists more in meat production than in crop production. (LLAZO, 2013) With the globalization happening in Albania, the consumption is shifting towards protein and nutritional food with meat origin. This is putting pressure for globalization of poultry sector in Albania, with better specializations in production methods, hygiene standards, quality standards and supply chain. (MANNING AND BAINES, 2004)

As shown in Table 4. Albanian imports poultry are mostly from: Greece, Brazil, US, and Germany. With the highest percentage US, this is explained of good relations and trust of customers between US and Albania. As seen the highest value is in December with 2.494.000 euro, this is because of festive months in Albania during this month. As expected, imports of Greece are relatively high, this is because Greece can easily trade and have a market in Albania since the distance for trading is low, since they are neighbours. Brazil the second biggest importer of Albania for poultry meat, the cheap prices, and affordable prices that Brazil chickens make them a big importer in poultry meat. Germany, imports less than Greece, Brazil, and US, with half of the market compared to countries mentioned above. The importing price is less than 1 euro.

Table 4. Import of poultry meat 2017

Poultry meat	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Quantity (ton)	1,835	1,940	2,126	1,616	2,253	1,849	2,297	2,086	1,816	1,955	2,314	2,750
Value(000Euro)	1,368	1,585	1,730	1,411	1,846	1,453	2,079	1,862	1,462	1,862	2,191	2,494
Price (Euro/kg)	0.75	0.82	0.81	0.87	0.82	0.79	0.90	0.89	0.80	0.95	0.95	0.91
Import structure by countries												
Greece	11%	30%	32%	26%	18%	20%	17%	21%	21%	17%	18%	18%
Brazil	14%	20%	18%	27%	12%	10%	26%	27%	13%	26%	24%	18%
US	38%	12%	15%	8%	18%	19%	10%	13%	12%	18%	12%	20%
Germany	8%	9%	6%	9%	11%	11%	15%	17%	15%	9%	13%	9%

Source: EUROSTAT (2018), SKRELI AND IMAMI, 2019

Figure 2 represents the overall meat value chain map. It consists in three channels: fresh meet channel, industry poultry channel and industrial meat processing channel. The Value chain for Poultry channel is overall short, it starts with farmers which may be small poultry farms and large poultry farms. The collection takes place for both farms and they end up in slaughterhouses. Slaughterhouses process represent some serious risks for overall customer health. The bad hygiene can contaminate the food. For example, Salmonella spp. in slaughters environment. The poultry product with linkage of slaughterhouses becomes a supply for meat shops, outlets, and restaurants. Con-

Figure 2. Meat value chain map
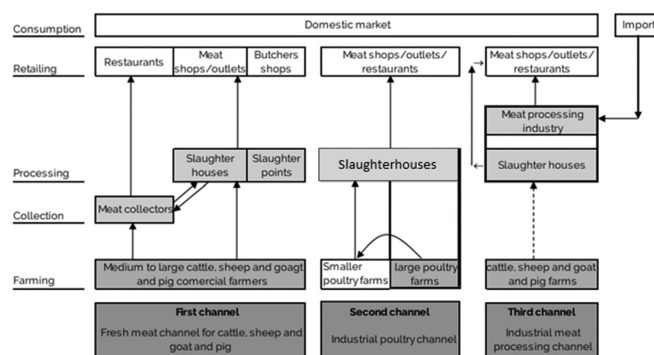
Source: SKRELI AND IMAMI, 2019

sumption is the domestic market. Also, the import plays a role in all channels. (JAHELEZI AND BIJO, 2014) European Union, based on IPARD II, has budget meat production industries, so they can be competitive in the single market of EU.

Table 5 gives the consumers price index for meat group production. Prices have increased by 0.3% from 2012 to 2013, increasing in 2014 with 1% and in 2015 remaining the same as 2014. Prices decreased from 2015 to 2016 0.1, with slightly increase in 2017 by 0.7%. From 2018 to 2021 we see an increasing patten, with the highest in 2021 with 5.2% increase for meat groups. The income in 2021 after deflation with 2012, decreased to 6056.6. From years 2013 to 2021 we see increasing trend of income per capita.

Table. 5: Consumer Price Index for meat group

Year	Average CPI Meat (CPI)	CPI (2012)	Income per capita	Deflation
2012	96,2	100	4248,92	4248,92
2013	97,1	100,952328	4422,67	4380,948984
2014	97,2	101,028313	4584,92	4538,252545
2015	97,3	101,083956	3974,79	3932,167042
2016	96,4	100,128359	4124,41	4119,122736
2017	96,9	100,718633	4525,89	4493,597534
2018	97,8	101,63811	5257,71	5172,971023
2019	98,2	102,072705	5345,06	5236,522315
2020	99,7	103,615561	5268,24	5084,410052
2020	101,3	105,252575	6374,79	6056,659426

Source: INSTAT (2020), STATISTA (2012-2021), own calculations

Agriculture production price index for poultry has increase in 2018 with 4.5, showing the same trend in 2019 with 4.9% increase. And 2020 had the highest increase with 5.2 % increase. Related to eggs for the agricultural product price index we see a fluctuation in trends, where in 2018 it has decreased with 2.5, it increased with 2.4 in 2019 and again it decreased with 1.9%.

Table. 6: Agricultural Product Price Index for poultry and eggs

Years	Agricultural Product Price Index	
2015 (Base Year)	**Poultry**	**Eggs**
2015	100	100
2018	104,5	97,5
2019	104,9	102,4
2020	105,2	101,9

Source: INSTAT (2020), own calculations.

REFERENCES

Raihan, S., & Mahmud, N. (2008). Trade and poverty linkages: A case study of the poultry industry in bangladesh. CUTS International: Geneva, Switzerland,

Goga, M. I. Consumers'preferences towards poultry meat products in Albania.

Devine, R. (2003). Meat consumption trends in the world the European Union. Productions Animales (France).

Skreli, E., & Imami, D. (2019). Meat Sector Study. Technical Report prepared for EBRD AASF Project. Available at: http://aasf. com. al/wp-content/uploads/2019/08/Meat-EN.

Babbie, E. R. (2020). The practice of social research Cengage learning.

Llazo, E. (2013). Small scale farming and agricultural product marketing in Albania. Folia Pomeranae Universitatis Technologiae Stetinensis.Oeconomica, 73

Manning, L., & Baines, R. N. (2004). Globalisation: A study of the poultry-meat supply chain. British Food Journal.

Jahelezi, R., & Bijo, B. (2014). Risk assessment of poultry sloughterhouses in albania. Albanian Journal of Agricultural Sciences, , 477.

Manning, L., Baines, R., & Chadd, S. (2008). Benchmarking the poultry meat supply chain. Benchmarking: An International Journal.

Boskin, M. J., Dulberger, E. L., Gordon, R. J., Griliches, Z., & Jorgenson, D. W. (1998). Consumer prices, the consumer price index, and the cost of living. Journal of economic perspectives, 12(1), 3-26.

Diewert, W. E. (1998). Index number issues in the consumer price index. Journal of Economic Perspectives, 12(1), 47-58.

Scanes, C. G. (2007). The global importance of poultry. Poultry science, 86(6), 1057.

Freund, R. J., & Wilson, W. J. (2003). Statistical methods. Elsevier.

PERCEPTIONS, PROFITABILITY AND DETERMINANTS OF GRANULATED CASSAVA PACKAGING IN KUMASI METROPOLIS, GHANA

**Enoch Kwame Tham-Agyekum, Fred Nimoh, Dora Boakye, Abednego Yeboah,
Umar Abdul Baqi Abubakar**

Kwame Nkrumah University of Science and Technology, Ghana

e-mail: ektagyekum@knust.edu.gh

Abstract: *Packaging does not only protect a product but also provides directions for using the product, as well as relevant information about its content and nutritional value. This study was undertaken to assess Granulated Cassava (Gari) sellers' perception, profitability and determinants of packaging in Ashanti Region. The study area was purposively selected because of the active participation and contribution of marketing activities. A structured questionnaire was administered in the form of interview to obtain primary data from the respondents. Data were analyzed using binary and multinomial logit regression model and Garret ranking technique. The results showed that there is 5% difference in the gross margin with packing of Gari, which is also statistically significant at 1%. Years of education, legal requirement, and durability of the packaging material and cost of packaging material were the significant factors that influence sellers' choice of packaging. Lack of technical know-how, cost of capital equipment and lack of knowledge on packaging equipment and/or material were the most limiting constraints affecting Gari packaging. The study recommends that investors should invest in the Gari packaging business since it has a relatively higher rate of returns as compared to the unpackaged one.*

INTRODUCTION

In this contemporary time, advertisers compete with each other to promote their position in the market, increase efficiency and attract customers' attention. Packaging is one of the most critical factors or components in the value addition chain of activities in the food or agro-processing industry. A good package sometimes gives a company more promotional effect than it could possibly afford with advertising creating a brand loyalty. It also gives directions for using the product, as well as relevant information about its contents, nutritional value and potential hazard(s). An adequate packaging helps to reduce malnutrition, removes local surpluses and helps to attract the consumer's attention (Anin, 2008).

As it is the first point of interaction with consumers, a lot of manufacturers, retailers and small business marketing geniuses are focusing on how they can improve their product packaging in order to lure more shoppers to buy their product. This has become the focus of many designers, to bring out the best packaging which seeks to protect products through their distribution channels and to communicate the product benefit to its target group. This can increase the

chances of converting the sheer packaging interest to actual sales which in return will improve the performance of the business (Bix, 2003).

The production, storage and marketing of Gari is still mainly carried out by local farmers, processors and foodstuff traders, while only a few highly mechanised processing plan market their products in consumer packaged forms (Oyeniran, 1980). Gari is still being packaged, transported and stored in woven sacks with attendant fluctuations in climatic conditions and sometimes it is being sold in the market in bowls with exposed surfaces thus increasing its susceptibility to environmental contaminations (Ogiehor & Ikenebomeh, 2006).

According to the Food and Drugs Board Legislative Instrument (LI) 1541, packaging is a mandatory requirement necessary for the sale of products by every business. Packaging has thus far been demonstrated to be a difference maker; it could make or break a brand or a business entity. Effective and efficient packaging of food and beverage products have been advocated as a means of developing new food products that impact positively on marketability and product quality (Mante, 2005). Studies have indicated that product packaging encompasses; the physical aspect of the container, the design,

the shape, the color, the labeling and the material used (Ampuero & Vila, 2006). Considering the cumbersome nature of production process, the need to have the finished products to cities where large buyers live, the importance of Gari in dietary intake and the need to meet the increasing international demand, the evaluation and identification of adequate packaging materials that will keep the overall quality of Gari during distribution and at the point of consumption becomes imperative (Ogiehor & Ikenebomeh, 2006).

For many consumer non-durables and durables, packaging may have direct function in terms of product satisfaction, customer trial and repetitive purchase. With regards to product satisfaction and repeat repurchase, packaging is useful due to the fact that packages poorly designed may discourage repurchase (Bloch, 2005). Consumers who are frustrated by packages that cannot be easily opened or labels that cannot be read without magnification may opt for brands that have considered the "human condition" in their package design (Bix, 2003). As a result of this, companies focus on product packaging, considering the graphics, color and appropriate packaging materials to increase their market share or business performance. According to Ghani & Kamal (2010), packaging plays a key role in product display as much impulse buying occurs as a result of product display. Thus packaging is an effective tool and as market mix has a strong potential to engage consumers. This is because consumers draw information about the product and its attributes from the package's aesthetic and graphic design (Moskowitz et al., 2009). Manufacturers may use packaging design to initiate expectations in the consumer about a product. These expectations may come from packaging design cues such as colors, words, symbols, materials, shapes and images which may in one way or the other carry a semiotic influence (Durgee, 2003).

Product Packaging possesses the potential to determine the success within a given market. It's certainly not the only determinant of business success but it sure plays a pivotal role. Packaging is not merely a production concern but also a marketing concern (Dunoo, 2016). A good package sometimes gives a company more promotional effect than it could possibly afford with advertising creating a brand loyalty. There is a strong and broad demand for packaged products in sub –Sahara Africa and this has a growing potential market population projected to double from 1.2 billion in 2015 to 2.4 billion by 2050 (Food and Agriculture Organization, 2012). In addition to the large local market for Gari there is huge opportunity with a much higher profit potential in exporting this product to Africans living in the US and Europe. However, there are strict guidelines concerning foods exporting to these countries (Jwuoha, 2013).

Despite the policies formulated and implemented by the Government of Ghana through the Ministry of Food and Agriculture and Ministry of Trade and Industry with regards to Gari packaging, the producers of Gari still use inappropriate storage and packaging methods for the product like hessian bags and transparent plastic polyethylene sheets (Oyelade et al., 2001). A cursory observation of made in Ghana Gari reveals that many sellers give little or no attention to the packaging of their Gari (Dunoo, 2015). Poor or inadequate Gari packaging constitutes a major constraint to investors as well as manufac-

turers. Although some of the locally made Gari are considered to be of high quality and unique to the country, they are not accepted as good packaged products to reap the full benefits of the product, especially outside the local market (Institute of Packaging Ghana (IOPG) Situational Analysis Report, 2014). This is a worrying trend with disastrous consequences. On November 1st 2015, the Government of Ghana placed a ban on light plastic materials with less than 20 microns (one millionth of a metre in term of density) such as the ones used in packaging Gari, sugar and porridge. This formed part of the government's effort in addressing the sanitation challenges the country is grappling with (www.myjoyonline.com).

According to the World Health Organization (WHO), one in every ten people falls ill from consuming contaminated food every year as a result of inappropriate packaging although local statistics are unavailable because of low reporting of condition at hospitals (myjoyonline.com). Most Gari produced in Ghana lack the good qualities a packaged product should possess. The container is either not appropriate for the product, or the illustration is not able to display the required information concerning the product, or the layout is overcrowded. As a result, there have been an increasing incident of waste disposal problems because of the non-biodegradable nature of the packaging material used (Sailaja & Chanda, 2001). The poor packaging has also impeded the export of this commodity to the EU and other markets. As a key element in the marketing mix, the benefits derived from Gari packaging could be immense if serious attention is given to it. It is therefore imperative to undertake this study to assess sellers' perception, profitability and determinants of Gari packaging. The following were the research questions; What are the forms and extent of packaging on Gari? What are the cost and returns involved in the packaging of Gari? What is the seller's perception on Gari packaging? What are the determinants and choice of Gari packaging? What are the constraints of Gari packaging?

RESEARCH METHODOLOGY

Kumasi Metropolis was chosen as the study area because the area contains a fairly large number of Gari sellers. The research design adopted was survey design, which involves the collection of qualitative and quantitative data that was quantitatively analyzed using descriptive and inferential statistics. This research design was employed in the study with the aim of assessing sellers' perception, profitability and determinants of Gari packaging.

This study employed the multistage sampling technique to obtain the primary data. The 3 Sub-metros were selected purposively in the first stage because they are amongst the high and middle income suburbs noted in Gari production and consumption. Furthermore, the respondents were selected from each market using snowball sampling technique because the respondents for the study were difficult to locate and questionnaire was distributed to hundred and twenty-two (122) Gari sellers in Kumasi metropolis making the total sample size for the study 122 respondents. Data on the socio-economic characteristics of the Gari sellers was coded, summarized using descriptive statistics such as means, charts, frequency distribution table and percent-

ages generated using the SPSS, STATA and Microsoft Excel. Income statement approach was used to analyze the cost and returns of the Gari selling business. The perception index was used to analyze seller's perception on Gari packaging. The factors that influence sellers' decision to package as well as choice of packaging were estimated using the binary and multinomial logit regression model. The various constraints of Gari packaging were ranked using the Garret ranking technique.

Profitability Analysis

Profitability is ability of a company to use its resources to generate revenues in excess of its expenses. In other words, this is a company's capability of generating profits from its operations. It is the primary goal of all business ventures and without it the business will not survive in the long run. Profitability is measured with income and expenses. Income is money generated from the activities of the business whereas expenses are the cost of resources used up or consumed by the activities of the business. Profitability actually looks at the relationship between the revenues/ incomes and expenses to see how well a company is performing and the future potential growth a company might have.

Although profit and profitability are used interchangeably, they are not the same since there are some distinct differences between the two. Profit is an absolute number determined by the amount of income or revenue above and beyond the costs or expenses a company incurs. It is calculated as total revenue less total expenses and appears on a company's income statement or trading profit or loss accounts. No matter the size or scope of the business or the industry in which it operates, a company's objective is always to make a profit. Profitability on the other hand is closely related to profit, but it is used to determine the scope of a company's profit in relation to the input employed. This is to say that profitability is a measurement of efficiency and ultimately its success or failure. It is therefore a relative figure and not an absolute figure like the profit. Profitability can therefore be said to be the ability of a business to produce a return on an investment based on its resources in comparison with an alternative investment. This means that although a company can realize a profit, this does not necessarily mean that the company is profitable.

Profitability is one of the four building blocks for analyzing financial statements and company performance as a whole. The other three are efficiency, solvency, and market prospects. There are many different ways for analyzing the profitability of a venture. The four common ones are Gross margin analysis, Net margin analysis, Operating margin and Return on assets. The first way of analyzing profitability is considered in this study.

The estimation of the profit margin percentage for packaged and unpackaged Gari, was formulated as follows:

$$Gross\ Margin = \frac{Gross\ Profit}{Sales}\ x\ 100\%$$

Where;
Gross profit= Total revenue – Total variable cost
Sales= Unit sold * Unit price
Total Variable Cost = Total Quantity of Output * Variable Cost Per Unit of Output

(Source: https://www.thebalancemb.com)

Empirical specification of the binary logit regression model

The binary logistic model was employed in analyzing the factors that determine sellers' decision to package since the observation falls into two categories (decision to package or not to packaged) of dichotomous dependent variable. The empirical specification of the binary logistic model for ascertaining the factors that determines sellers' decision to package a product is outlined below.

Yi = βo+β1SEi+β2EDUi+ β3QTYPi + β4LRi + β5PSi+ β6SLi + β7DUi + β8PMi + εi

Yi denotes seller's decision to package Gari as the dependent variable, β1 to β8 represents the various coefficients of the independent variables to be estimated while βo and εi represents the constant and the error term respectively. Table 3.1 presents the variables used in the regression model, their definitions, measurements and a-priori expectations.

Description of variables

Table 1: Description of variables

Variable	Definition/Meaning	Measurement
βo	Constant	
εi	Error Terms	
β1- β7	Coefficients	
Dependent variable		
Yi	Sellers decision to package	
Independent variables		
Variables	**Measurement**	**A-prior sign**
Experience (SEi)	Years of selling Gari	+/-
Education (EDUi)	Number of years in formal education	+
Quantity purchased (QTYPi)	Kg	+/-
Legal requirement (LRi)	1 = yes, 0 = otherwise	+/-
Product safety (PSi)	1 = yes, 0 = otherwise	+/-
Shelf life (SLi)	1 = yes, 0 = otherwise	+/-
Durability of packaging material (SLi)	1 = yes, 0 = otherwise	+
Packaging material cost	GH₵	+

Source: Field Survey, 2021

Description of independent variables and a-priori expectations

Several factors were considered as variables in determining the seller's decision to package or not to package Gari. These variables have their expectation and influence on sellers' decision to package or not to package. Basically, the study expects some variables to have a positive influence and others to have a negative influence on sellers' decision to package or not.

Years of selling experience: Years of selling experience of the respondent was expected to affect the sellers' decision to package negatively. This means that the higher the number of years of selling experience, the more likely respondent would not package. This is because, the more years of the sellers' experience to sell without packaging the more likely he/she will be convinced not to package with an idea of not adding any further additional cost.

Education: The education of the respondent was expected to influence their decision to package positively. This is where collection of data focused on the number of years in formal education implying the higher the number of years in formal education, the more likely the person would package his/her Gari. This is because people with higher number of years in formal education were expected to have more knowledge on the benefits of packaging Gari.

Quantity purchased: Quantity purchased is also another variable which was expected to influence the sellers' decision to package negatively. This is because people with higher quantity of purchase incur high variable cost which in returns discouraged them from adding further cost of packaging.

Legal requirement: Another variable was legal requirement. Legal requirement was expected to influence their decision positively or negatively. More specifically, the study recorded the legal requirement as a dummy variable where 1 represented yes (if the seller considers) and 0 represented no (otherwise).

Product safety: Another variable was product safety. Product safety was expected to influence their decision positively or negatively more specifically, the study recorded the product safety as a dummy variable where 1 represented yes (if the seller considers) and 0 represented no (otherwise).

Shelf life: Another variable was product shelf life. Shelf life was expected to influence their decision negatively or positively, the study recorded the product shelf life as a dummy variable where 1 represented yes (if the seller considers) and 0 represented no (otherwise).

Durability of the packaging material: The expected influence of this variable was positive. This is because the durability of the packaging material has positive influence on controlling product wastage during distribution since quality packaging material would directly control product leakage. The study recorded the durability of the packaging material as a dummy variable where 1 represented yes (if the seller considers) and 0 represented no (otherwise).

Cost of packaging material: Another variable with positive or negative expectation on seller's decision to package. This is because a cedi increase in the cost of packaging material will directly affect the variable cost, selling price of the product which in returns will have an impact on their sales or revenue level.

Garrett ranking technique

To find out the constraints associated with Gari packaging in Kumasi Metropolis, the Garrett ranking was used (Sedaghat, 2011). The Gari sellers were asked to rank the constraints given on the questionnaire in the order of severity to their business. Where one (1) means most severe, two (2) means more severe,

three (3) means severe in a descending manner. The order of merit assigned by the Gari sellers was converted into ranks using the following formula;

$$\text{Percentage position of each rank } = \frac{100(R_{ij}-0.5)}{N_j}$$

Where;
R_{ij} = denotes the rank given for the ith factor by jth individual
N_j = donates the number of factors ranked by the jth individual

For each constraint, the response was summed together and divided by the total number of Gari sellers for whom scores were assigned to. These mean scores for all the constraints were arranged in descending order, ranks were given and the most limiting constraints were identified.

RESULTS AND DISCUSSION

Socio economic characteristics of Gari sellers

Table 2: Socio economic characteristics of Gari sellers

Variables	Category	Frequency	Percentage (%)
Age	20 – 30	29	23.7
	31 – 40	50	41.0
	41 – 50	28	23.0
	51 – 60	12	9.8
	61 – 70	3	2.5
Sex	Male	25	20.5
	Female	97	79.5
Marital status	Single	41	33.6
	Married	71	58.2
	Divorced	6	4.9
	Widowed	4	3.3
Educational level	Primary	16	13.1
	Middle school	44	36.1
	Senior high	50	41.0
	Tertiary	12	9.8
Religion	Christianity	92	75.4
	Islam	16	13.1
	Traditionalist	3	2.5
	Others	11	9.0
Ethnic affiliation	Akan	67	54.9
	Ga	16	13.1
	Ewe	10	8.2
		29	23.8

Source: Field Survey, 2021

The minimum age of the respondents is twenty (20) years, the maximum age is sixty-three (63) years and the average age of the respondents in the study area is thirty-eight (38) years. This clearly indicates that there are more matured people who are involved in the Gari business. This means that Gari business is dominated by people in the economically active population bracket age group of 20 to 65 years in the study

area. This is consistent with observations made by Boateng et al., (2013) that economically active age group in Ghana is between 14 and 66 years.

It was found that Gari selling as a business in the Kumasi Metropolis is female dominated. This is because, out of the hundred and twenty-two (122) respondents interviewed, ninety-seven were females, representing 79.5% of the total sample whereas 25 males are into the Gari business representing 20.5%. This gender composition of the study is consistent with the national figures, where 50.48% of the population constitutes females while 49.52% is male (FAO, 2012) and also the active role of women in the cassava industry and their predominance in the processing and marketing than their male counterparts who dominate in the production of cassava roots. (Adegeye et al., 1999)

Majority of the respondents (92) were Christians representing 75.4% of the sample, this is in conformance with the 2010 census which shows Christianity as the largest religion in Ghana with approximately 71.2% of the population being members of various Christian denominations and Kumasi being the second largest town dominated by Christians (Ghana, The Fact Book, 2014).

It was realized that majority of Gari sellers which represents 58.2% of the population are married and 34% are single. The educational level of Gari sellers was categorized into five groups; primary, middle school, secondary, tertiary and no formal education. Sixteen (16), forty-four (44), fifty (50) and Gari sellers had primary, middle school, secondary education. The corresponding percentages are 13.1%, 36.1%, and 41.0%. Sellers with different educational backgrounds go into Gari business with the least category being those with primary education. This implies that most Gari sellers are literates, thus, they are able to read about new technologies that can improve Gari packaging. Gari sellers within the study area belong to various ethnic groups. The ethnic groups were categorized into four (4) groups namely; Akan, Ga, Ewe and others. From the data collected, majority (55%) of the Gari sellers within Kumasi Metropolis are Akans.

Form and extent of Gari packaging
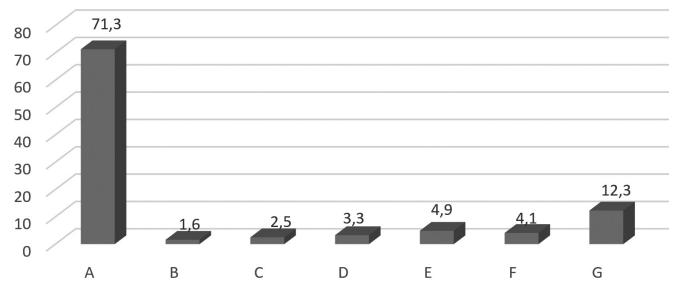
Figure 1: Forms of Gari packaging
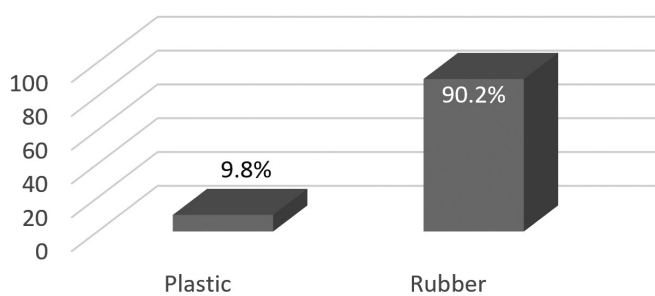
It was found that out of the 122 respondents, 12 sellers representing 9.8% used plastic whiles the remaining 110 sellers representing 90.2% used rubber as a form of packaging material.

Extent of Gari packaging
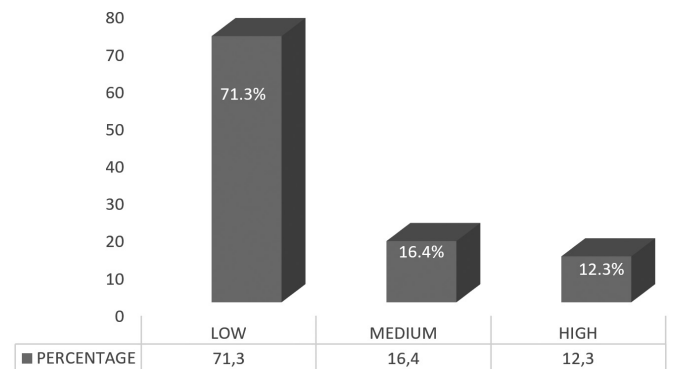
Figure 2: Extent of Gari packaging

Source: Field Survey, 2021

The extent of Gari packaging was categorized into seven (7) different groups as follows:

A = Only container/packaging material (e.g. rubber, plastic)

B = Container and name of manufacturer

C = Container, name of manufacturer and product composition

D = Container, name of manufacturer, product composition and location of business

E = Container, name of manufacturer, product composition, location and nutritional benefit

F = Container, name of manufacturer, product composition, location, nutritional benefits and expiry date

G = Container, name of manufacturer, product composition, location, nutritional benefits, expiry date, barcode and mode of usage and storage

From the Figure 2, it was found that majority (71.3%) of the Gari sellers in Kumasi Metropolis use only container (packaging material) without any further proper identification with only container or packaging material whiles the least extent was category (B) with only two (2) respondents representing (1.6%).

Figure 3: Choice of Gari packaging

Source: Field Survey, 2021

The extent of Gari packaging was further categorized into three (3) different levels to ascertain the factors that influenced sellers' choice of packaging Gari (Figure 4.3). The lower level represents only container/packaging material (e.g.

rubber, plastic), the medium level represents container, name of manufacturer, product composition, location and nutritional benefit and the higher level represents container, name of manufacturer, product composition, location, nutritional benefits, expiry date, barcode and mode of usage and storage. The lower level with packaging material without any additional information constituted 71.3% of the total sample. The medium level with additional information like name of manufacturer, product composition, location and nutritional benefit had 20 respondents representing 16.4% of the total sample and the remaining 15 respondents of the sample who were able to package their Gari to meet the required standard set by law backing product packaging constituted 12.3% of the sample.

Costs and returns analysis on Gari packaging

Variable cost items in Gari packaging

The cost and returns analysis shows the cost incurred and revenue generated by Gari sellers who are into selling of packaged and unpackaged Gari in one production cycle (monthly) in the study area. Data on the cost and return items of the individual sellers were collected and categorized into packaged and unpackaged. Hence, analysis was made on the kilogram scale basis to know the respective average costs and returns for each scale of production that sellers were operating. The total cost of Gari selling consists of fixed and variable costs. But this study seeks to consider only variable cost items in Gari selling to avoid bias representation of information. This is because, during our field interviews it was found out fixed cost items in the Gari selling are not specifically assigned to only Gari selling but other ventures as well. The revenue generated was obtained from sales from the product (Gari). This was calculated by multiplying the unit price by the number of kilograms/ Gari produced per production cycle (mothly).

Variable cost is cost which vary as the size and/or level of output of an activity varies, which is also known as direct cost such as raw product (Gari), cost of packaging material, labour, transportation, labeling. The costs of inputs for each scale of production are shown below in the Table 3.

Table 3: Variable cost per production cycle of Gari packaging

VARIABLES	MIN	MAX	MEAN	STD. DEV.
PACKAGED				
Raw Gari (Raw material)	360	3120	1658.28	26.21
Quantity purchased/ packaged (bag)	2	12	7.46	2.56
Purchasing cost	180	260	222.29	23.65
Selling price (2kg)	10	18	14.26	1.92
Cost of packaging material	12	25	17.39	3.37
Labour (production cycle)	10	300	64.74	63.10
Transportation	10	35	18.78	5.48
Labeling	.20	1	0.54	0.28

UNPACKAGED				
Raw Gari	360	7500	1886.90	25.19
Quantity purchased (bag)	2	30	8.89	4.76
Purchasing cost (bag)	180	250	210	20.44
Selling price (2kg)	8.00	12	9.70	0.75
Rubber	1.50	5.0	2.85	0.69
Labour (loading & offloading)	3.0	30	13.00	8.06
Transportation	10	60	23.84	8.06

Source: Field Survey, 2021

Returns on production

Average output per production

The average output per production cycle was calculated by summing all quantities purchased and dividing it by the number of respondents.

Average return per cycle of Gari production

The average return was calculated by multiplying the average quantity of output purchased by the average price per kg of Gari.

Income statement

The income statement presents a summary of the average cost and returns to Gari packaging in the production cycle. It reveals the gross income, total variable cost, as well as their margins. Profitability is the primary goal for most business ventures. Without profit, the business will not survive in the long-run. Consequently, measuring current and past profitability and projecting future profitability is very important (Hofstrand, 2006).

Table 4: Cost and returns for packaged and unpackaged Gari sellers

Particulars	Packaged	Unpackaged
	GH₵	GH₵
Income (A)	3513.93	2847.55
Less Variable Cost		
Raw Gari	1858.28	1866.9
Packaging material (Rubber)	129.73	25.34
Labour	64.74	13
Transportation	18.78	23.84
Labeling	132.94	0
Total Variable Cost (B)	2204.47	1929.08
Gross margin (A-B)	1309.46	918.47
Gross Margin percent of Income [(A-B)/A]*100	37%	32%

Source: Field Survey, 2021

For the packaged and unpackaged Gari, packaged Gari had average total variable cost of GH₵ 2204.47 as compared to the average total variable cost of 1929.08 for unpackaged Gari which represents 100% of the total cost for both ventures since the study considers only variable cost. The raw Gari accounted for the high value of the variable cost representing about 84% and 97% of the average total variable costs for the packaged and unpackaged Gari respectively. With regards to the above percentages, it can be concluded that, raw material (Gari) cost constitutes the majority of the variable cost items for both packaged and unpackaged Gari business in the study area.

Table 5: T-test to compare the means of profit of packaged and unpackaged Gari

Variable	Packaged	Unpack-aged	Mean difference	P value	t-value
Profit	1509.46	918.47	590.87	0.000	5.52

Significant at 1%
Source: Field Survey, 2021

The T-test was run to show whether there is a significant difference between the means of the profit of packaged and unpackaged Gari. Our null hypothesis was that there is a significant difference between the means of profit of packaged and unpackaged Gari. Thus, from the results in Table 5, there is much evidence to accept the null hypothesis as the difference was significant at 1%.

Sellers' perception on Gari Packaging

Table 6: Sellers' Perception on Gari Packaging

Perception statements	Strongly Agree (2)	Agree (1)	Neutral (0)	Disagree (-1)	Strongly Disagree (-2)	Mean Score
The success of foreign made products as compared to their locally made counterparts is as a result of their good packaging	30(24.6)	37(30.3)	47(38.5)		1(0.8)	0.72
The element of packaging material like colour, shape, material used, typography influences consumer product choice the most	29(23.8)	41(33.6)	36(29.5)	(-1)	2(1.6)	0.66
The quality of the product in the long run is influenced by the durability of the packaging material used	7(5.7)	22(18.0)	56(45.9)	21(17.2)	16(13.1)	-.14
The safety of a product is determined by its packaging material	45(36.9)	46(37.7)	24(19.7)	6(4.9)	1(0.1)	1.05
Packaging increases the shelf life of a product	47(38.5)	43(35.2)	27(22.1)	3(3.3)	1(0.8)	1.11
Packaging material perception index						**0.68**
The extent of locally packaged products impress consumers most	32(26.2)	28(23.0)	42(34.4)	19(15.6)	1(0.8)	0.58
The extent of packaging influences the purchasing decision of consumers	33(27.0)	44(36.1)	35(28.7)	7(5.7)	3(2.5)	0.80
Consumers perception on packaging determines the extent of a seller's decision to package	19(15.6)	26(21.3)	46(37.7)	24(19.7)	7(5.7)	0.21
Seller's perception index on consumers purchasing decision						**0.53**
Packaging directly influences the sales of a product	36(29.5)	39(32.0)	29(23.8)	14(11.5)	4(3.3)	0.73
Packaging is the driving tool for high patronage of locally made products	33(27.0)	33(27.0)	27(22.1)	18(14.8)	11(9.0)	0.48
Locally made products are not patronized as a result of its poor packaging nature	29(23.8)	39(32.0)	30(24.6)	19(15.6)	5(4.1)	0.56
Ignorance of packaging importance has a direct effect on low patronage of locally made products	24(19.7)	30(24.6)	54(44.3)	14(11.5)	0(0)	0.52
Packaging has a direct relationship with profit	64(52.5)	35(28.7)	20(16.4)	3(2.5)	0(0)	1.31
Perception index on sales						**0.72**
Product price is determined by its packaging	76(62.3)	40(32.8)	6(4.9)	0(0)	0(0)	1.57
Materials for packaging has a direct relationship with the high price of the product	29(23.8)	61(50.0)	26(21.3)	3(2.5)	3(2.5)	0.90
Perception index on price						**1.23**
Product packaging is basically done because it is a legal requirement	46(37.7)	24(19.7)	24(19.7)	20(16.4)	8(6.6)	0.65

Packaging is a tool for product differentiation	56(45.9)	34(27.9)	27(22.1)	4(3.3)	1(0.8)	1.15
Product packaging solely displays the content of the product	10(8.2)	29(23.8)	40(32.8)	29(23.8)	14(11.5)	-.07
Numerous packaging constraints has a direct influence on poor packaging of locally made products	39(32.0)	45(36.9)	20(16.4)	17(13.9)	1(0.8)	0.85
Perception index on the other statements (legal requirement, product differentiation, product display, constraints)						**0.64**
TOTAL PERCEPTION INDEX						**0.76**

Source: Field Survey, 2021

The Gari sellers were asked to give their perception about some statements relating to the packaging of Gari for business success based on five main perception statement categories: packaging material, seller's perception on consumers purchasing decision, perception on sales, perception on price and others. Gari sellers' responses with respect to the various perception statements are presented in Table 6 below. The results show that the mean perception index for the packaging material was 0.68 suggesting that the Gari sellers' had an agreeing perception in terms of packaging material having a positive effect on product quality and differentiation. The mean perception index for sellers' perception on consumer's purchasing decision was 0.53 indicating that the Gari sellers had an agreeing perception about consumer's purchasing decision influenced by the packaging of the product. The positive perception can be attributed to the fact that, they regard packaging as an important tool to be kept as an economic asset.

Gari sellers further agreed with a mean perception index of 0.72 and 1.23 for sales and price respectively indicating their total agreement with the perception statements on sales and price. Lastly, other perception statement like packaging as a legal requirement, as a tool for product differentiation and displaying the product content had a mean perception index of 0.64 indicating their agreement with the perception statements.

The overall mean perception index was 0.76, indicating that the sellers had an agreeing perception on packaging as a tool for product success. But the respondents expressed their dissatisfaction with consumers' negative perception on packaged Gari because they consider it as a low cost product which does not need to be packaged.

Table 7: Descriptive statistics on independent variables included in the model

VARIABLES	CONTINUOUS VARIABLES			
	Minimum	Maximum	Mean	Std Deviation
Years of formal education	6	16	10.62	2.66699
Years of selling experience	1	20	6.80	4.42315
Quantity purchased	2.00	30	9.16	4.42532
	1.50	25	5.62	6.60692
Cost of packaging material	**DUMMY VARIABLES**			
	YES		NO	
	Frequency	percentage	Frequency	percentage
Legal requirement	70	57.4	28	23
Product safety	91	74.6	7	5.7
Shelf life	90	73.8	4	3.3
Durability of packaging material	29	23.8	37	30.3

Source: Field Survey, 2021

Table 7 shows the summary descriptive statistics for the variables included in the model. Out of the 122 respondents, the minimum years of sellers' with basic formal education level was 6 and maximum of 16 years representing sellers' with tertiary education level. The minimum years of selling experience was 1 and a maximum of 20, minimum quantity purchase of 2 bags which is equivalent to 132kg and a maximum quantity purchased of 30 bags representing 1980kg of Gari. The minimum cost of packaging material was GH₵1.50 and a maximum of GH₵25 per production cycle (1 month).

In addition, 70 respondents out of the total sample for the study representing a percentage of 57.4 agreed (Yes) to the perception that packaging is done because is a legal requirement and 28 respondents representing a percentage of 23 disagreed (Otherwise). 91 respondents representing 74.6% agreed to the perception on product safety and 7 representing 5.7% disagreed whiles 90 respondents with a percentage of 73.8 agreed to the perception statement that packaging increases the shelf life of a product and 4 respondents representing 3.3% disagreed. Respondents of 29 representing 23.8% agreed and 37 representing 30.3% disagreed with the perception statement on durability.

Determinants of Gari packaging using binary logistic regression model

Table 8: Determinants of Gari packaging

Decision to package					
	Coefficient	Z	Marginal effect (dy/dx)	P>z	SE
Years of selling experience	-0.08	-0.96	-0.00	0.34	0.08

Years of education	0.23**	2.01	0.03	0.04	0.12
Quantity purchased	-0.05	-0.67	-0.01	0.51	0.07
Legal requirement	-0.53**	-2.07	-0.06	0.04	0.25
Product safety	0.44	1.15	0.05	0.25	0.38
Shelf life	-0.05	-0.14	-0.00	0.89	0.32
Durability of packaging material	0.66**	2.16	0.08	0.03	0.30
Cost of packaging material	.019***	3.78	0.01	0.00	0.05
Constant	-3.94			0.01	1.58

*Number of obs = 122   ***, ** Sig @ 1% and 5%.*
Prob>chi2= 0.0000   Pseudo R2 = 0.37
Source: Field Survey, 2021

Using the binary logistic regression model where decision to package was categorized into two (1 representing decision to package and 0 otherwise), sellers' decision to package was regressed against the socioeconomic variables.

From Table 8, all the independent variables were in conformity with the a-priori expectations. This means that as the years of education of a seller increase, the seller's decision to package also increases. Legal requirement which has a negative marginal effect with regards to the decision to package means that as the legal requirements on Gari packaging increases, the decision to package also decreases. From the table, four of the independent variables were statistically significant. Years of education, legal requirement and durability of the packaging material were significant at 5% whereas cost of packaging material was significant at 1%.

The marginal effect of the years of education of a seller means that a year increase in a seller's education will increase the seller's decision to package by 3%. This is concluded that, the higher the years of education of a seller, the higher their decision to package. This can be attributed to the fact that, sellers with higher number of years of education have better understanding on packaging requirement and technique.

The coefficient of legal requirement means that strengthening of packaging laws will increase the seller's decision not to package by 6%. This is because as the law backing Gari packaging is strengthened sellers will be required to increase their extent of packaging to the required standard, but because of the constraints of lack of technical know-how, cost of capital equipment and lack of knowledge on the packaging material or equipment sellers may not be able meet the standard which may trigger their decision not to package.

The coefficient of durability of the packaging material given also means that an increase in the quality of the packaging material will increase the seller's decision to package by 8%. Meaning an increase in the durability of a packaging material will have a positive marginal effect on the sellers' decision to package because, the durability of the packaging material will determine the price of the Gari which will eventually determine the net sales and gross profit of the production.

The coefficient of cost of packaging material also means that a cedi increase in the cost of the packaging material will increase the seller's decision to package by 1%. Meaning a

cedi increase in the cost of packaging material will have a positive marginal effect on the sellers' decision to package because, the cost of the packaging material will determine the price of the Gari which in returns will eventually determine the net sales and gross profit of the production.

The Pseudo R2 of 37% means that the significant variables; Years of education, Legal requirement, Durability of the packaging material and cost of packaging material will affect the sellers' decision to package by 37%.

Choice of packaging using the multinomial logit model

Table 9: Choice of Packaging using Multinomial Logit Regression

Choice of packaging	Coefficient	Z	Marginal effect (dy/dx)	P>z	SE
0	(Baseline)				
1 (medium level)					
Years of selling experience	-0.04	-0.44	0.01	0.658	0.08
Years of education	0.13	1.06	0.03	0.291	0.12
Quantity purchase	-0.01	-0.18	0.00	0.855	0.08
Legal requirement	-0.54*	-1.85	-0.08	0.064	0.29
Product safety	0.56	1.26	-0.06	0.207	0.44
Durability of packaging material	0.71**	2.09	0.09	0.036	0.34
Cost of packaging material	0.18***	3.52	0.02	0.000	0.05
Constant	-3.96			0.003	2.15
***, ** & * Sig @ 1%,5% and 10% respectively					
2 (high level)					
Years of selling experience	-0.24	-1.57	0.01	0.12	0.15
Years of education	0.48***	2.78	0.03	0.00	0.17
Quantity purchase	-0.11	-1.00	0.00	0.32	0.11
Legal requirement	-0.59*	-1.70	-0.08	0.09	0.35
Product safety	0.08	0.15	-0.06	0.88	0.54
Durability of packaging material	0.59	1.49	-0.09	0.14	0.39
Cost of packaging material	0.20***	3.32	0.02	0.00	0.06
Constant	-6.36			0.00	2.14
***,* Sig @ 1% and 10%					

Number of obs = 122   Pro>chi2 = 0.00   Pseudo R2 = 0.33

Source: Field Survey, 2021

Using the multinomial logit model where choice of packaging was categorized into three (3) namely low (0), medium (1) and high (2) levels of packaging with the low level as the baseline. This model was used in addition to the binary logit model because the dependent variable here is nominal which allows for a dependent variable with more than two (2) categories and it's also considered as an extension of the binary logit model.

From Table 9 (medium level), it can be seen that durability of the packaging material has a 9% increase on a seller's choice to package at the medium level however, it is insignificant in high level. Amongst the other significant variables in each level (medium and high), it is quite clear that an additional increase in the years of education of a seller will have a 3% increase on the seller's choice of packaging at a high level. Legal requirement which is significant at both levels will have between 8% decrease on a seller's choice of either the medium or high level of packaging. Whereas cost of the packaging material has a 2% increase on the seller's choice to package at both medium and high levels.

Constraints faced by Gari Sellers

Table 10: Constraints faced by Gari Sellers

Constraints	Total	Mean	Rank
Lack of technical know-how	10132	83.05	1st
Capital equipment	10015	82.09	2nd
Lack of knowledge of the materials and or packaging requirements	7212	81.80	3rd
Time constraints	9912	81.25	4th
Access to packaging materials and equipment	9798	80.31	5th
Cost of packaging materials	9612	78.79	6th
Low consumer patronage	9560	78.36	7th
Price fluctuation	9382	76.90	8th
Lack of information on packaging	9198	75.39	9th
Environmental issues	8896	72.92	10th
Inadequate storage facilities	8810	72.21	11th
Pricing pressure from consumers	8788	72.03	12th
Transportation	8782	71.98	13th
Material handling	8778	71.95	14th
Labour	8748	71.70	15th
Space constraints	8740	71.64	16th

Source: Field Survey, 2021

Constraints are considered as any factors or elements that work as bottlenecks or obstacle that restrict an entity, project, or system (Such as a manufacturing or decision making process) from achieving its potentials or goals (Mboge, 2015). Some of the constraints such as cost of packaging material, transportation, environmental issues, lack of technical know-how, material handling, lack of knowledge of the materials and /or packaging requirements, low consumer patronage, labour, pricing pressure from consumers, capital equipment, space constraints, time constraints and inadequate storage facilities were identified through literature and were confirmed by our various respondents. Price fluctuation, lack of information and access to packaging materials were amongst the least constraints realized on the field.

Data collected from respondents was analyzed using the garret ranking technique where total scores obtained from the respondents based on the constraints were divided by the total number of respondents (122) to get their respective mean scores. The resulting mean scores were ranked in a descending order with the first (1st) position being the most limiting factor or severe constraint which affects packaging. The results in Table 10 show that lack of technical know-how, capital equipment and lack of knowledge of the materials and/or packaging requirements were the most limiting constraints faced by the Gari sellers which rank 1st, 2nd and 3rd respectively with material handling, labour and space as the least constraints faced by sellers ranking 14th, 15th and 16th.

CONCLUSIONS

The study shows that Gari packaging is categorized into two forms with rubber recording the highest number of 110 representing ninety percent (90.2) as compared to plastic of 12 in number representing ten percent (10%) of the total respondents. The study also shows that the choice of Gari packaging can be categorised into three (3) different levels with low level having the highest frequency with a percentage of 71.3, medium having 12.3% and high level with 16.4%. The empirical results also show that the Gari selling as a business is profitable when well packaged and unpackaged, however the packaged Gari is more profitable since it has a gross margin of 37% greater than that of the unpackaged Gari which has a gross margin of 32%, giving a difference of 5%. The T-test results show that there is a statistically significant difference between the profit of the packaged and unpackaged Gari at 1%.

The mean perception for the packaging material, sales, price, and seller's perception on consumer's purchasing decision and the other perception statements are 0.68, 0.72, 1.23, 0.53 and 0.64 respectively. The study also shows a total perception index of 0.76, which indicates the seller's agreement with regards to the perception statements. It can also be concluded that the cost of packaging material, durability and years of education are the significant factors that affect seller's decision to package. Lack of technical know-how, capital equipment and lack of knowledge of the materials and/or packaging requirements are the most limiting constraints faced by the Gari sellers with material handling, labour and space as the least constraints faced by sellers.

From the study, the following recommendations are given: the profit margin in the study shows that, both ventures are profitable. Hence, investors are encouraged to invest in the Gari packaging business since it has a relatively higher rate of returns as compared to the unpackaged one as their profit difference is statistically significant. Periodic packaging training and seminars for all sellers in the Gari industry should be held to educate them on current trends, do's and don'ts of the industry as well as formulate appropriate packaging laws well-tailored towards improving made-in-Ghana Gari to meet international standards. The study showed that majority of the sellers package their Gari in an unstandardized way (lower level), this has negative implications on both sellers and consumers (Oluwamukomi and Adeyemi, 2015) therefore there is a need for sellers to package their Gari in a standardized way (higher level).

REFERENCES

Adegeye, A. J., Omonona, B. T., & Awoyemi, T.T. (1999). Issues and Options in Expanding the Cassava Industry (production, processing and marketing) in Nigeria prepared for FADU, LFN and NIRADO. Published thesis submitted to the Department of Agricultural Economics, University of Ibadan, Ibadan, Nigeria.

Ampuero, O. & Villa, N. (2006). Consumers' perception of product packaging. Journal of consumer marketing, 23(2), 100-112

Anin, K.S. (2008). Studies on the Use of Two Packages on Some Chemical and Sensory Properties of 'Fresh Taste': A Natural Orange Drink, College of Science, Unpublished thesis submitted to KNUST, Kumasi, Ghana

Bix, L. (2003). The Packaging Matrix: Linking Package Design Criteria to the Marketing Mix (Published Doctoral dissertation submitted to Michigan State University).

Bloch, P. H. (2005). "Seeking the Ideal Form: Product Design and Consumer Response," Journal of Marketing, 59(1): 16-29.

Boateng, V.F., Alhassan E.H., Saahene Y., Nensom E. and Abarike, E.D. (2013) Profitability Analysis of all-male Tilapia Farming in Sekyere South and Bosomtwe Districts of Ashanti Region. Agriculture and biology journal of North America Agric., 4(5): 568-575, ISSN Print: 2151-7517.

Dunoo, D. D., (2015 & 2016). An article on packaging of made in Ghana goods from the World Wide Web: www.ghanaweb.com

Durgee, J.F. (2003). Visual rhetoric in new product design. Advances in Consumer Research, 30(19): 367–372.

Ghani, U. and Kamal, Y. (2010). "The impact of in-store stimuli on the impulse purchase behaviour of consumers in Pakistan", The Interdisciplinary Journal of Contemporary Research in Business, 8(1), 155-60

Institute Of Packaging Ghana (2004)

Jwuoha, J. P (2013) Gari and Cassava production. A small business that can change your life. Retrieved from https://www.small starter.com

Leonoard, E. A. (1980). Packaging Economics. New York: Books for Industry.

Mante, E.S (2005), Personal Communication, Institute of Packaging, Ghana (IOPG), August 20, 2005

Mboge, A.B. (2015). Opportunities and Constraints of Fish farming in Ghana (A Case Study of Ashanti Region). An MPhil published Thesis submitted to Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

Moskowitz, H.R., Reisner, M., Lawlor, J.B. & Deliza, R. (2009). Packaging Research in Food Product Design and Development. Wiley-Blackwell: Ames.

Ogiehor, I.S. & Ikenebomeh, M.J. (2006). The effects of different packaging materials on the shelf stability of Gari. African Journal of Biotechnology. 5 (23):2412-2416

Oluwamukomi, M. & Adeyemi, I. (2015). Influence of temperature and packaging materials on the storage qualities of soy-melon "Gari"-a protein enriched cassava product, American Journal of Advanced Food Science and Technology, 3(1): 36-52

Oyelade, J.O., Igbeka, J. C. and Aworh, O. C. (2001). Moisture isotherms of cowpea flour at 30℃ and 40℃. Journal of food process Engineering 9.3: 191-200

Oyeniran, J. O. (1980). Mould development in Gari during storage in polythene and Hessian bags. Nigerian Journal of Agricultural Science, 2(2): 151-155

Sailaja, R.R.N. and Chanda, M. (2001). Use of maleicanhydride-grafted polythene as compatabilizer for HDPE-tapioca starch blends: effects on mechanical properties. Journal of Applied Polymer Science 80(1), 863-872

Sedaghat, R. (2011). Constraints in Production and Marketing of Iran's Pistachio and the Policies Concerned: An Application of the Garret Ranking Technique. Archive of SID.