

A survey of the barriers associated with product development in tomato-based agro-allied food companies in Nigeria

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Abstract

The contributions of the tomato-based agro-allied companies in Nigeria cannot be over-emphasized because nearly every household consumes tomato products on daily basis. There is low industrial take-off and poor product development among existing agro-allied industries, especially for perishables like a tomato. The current study, therefore, seeks to investigate the factors militating against product development in tomato-based agro-allied food companies in Nigeria. The study employed a survey research design. Multistage sampling technique was used to select respondents for the study in the 23 companies studied. In the first stage, fifteen (15) out of the 23 listed and seven (7) out of the seventeen 17 non-listed tomato processing companies were purposively and conveniently selected for the study. In the second stage, the researcher stratified selected companies into existing three departments; Research and Development, Production and marketing were purposively selected. Finally, a simple random sampling technique was used and participants were selected proportionately to the size of each department and a total of 450 respondents were selected. A structured questionnaire was used to collect the data from the respondents. Data were analyzed using descriptive and inferential statistics (multiple regression and t-test) at $P \leq 0.05$. Findings revealed that three commonly produced tomato-based products in Nigeria are Tomato paste (15.7%) closely followed by Tomato juice (12.8%) and Tomato sauce (12.6%). Others includes Crushed Italian tomatoes (5.9%), Tomato Ketchup (10%), Tomato Puree (5.7%), Passata (6.9%), Sun dried tomatoes (10.7%), Tomato fat (7.1%), Tomato oil (11%) and others (1.6%) respectively. This result shows that most tomato based agro-allied food companies in Nigeria develop mostly tomato paste. It revealed an overall high level of product development with an overall average mean of (mean = 3.32) on the scale of 4points. The identified factors ranges from sluggish exports (mean = 4.1), local market sales (mean = 4.1), custom duties (mean=4.1), exchange rate fluctuation (mean = 4.0), high interest rate (mean = 4.0), price increase (mean = 4.0), procurement of parts (mean = 4.0), inequality control (mean=4.0), lack of progress (mean = 3.9), increase in personnel expenses and increase in fuel (mean =3.9) and lastly lack of facilities, stricter environmental regulations, electric power shortage, inadequate logistics (mean = 3.8) The study concluded that actors and stakeholders in the tomato based agro-allied food companies in Nigeria should be commended for their efforts in sustaining tomato based agro-allied products in the country. The paper recommended that policy makers and heads of production departments of these companies should give more attention to production of other products for increase sales of agricultural products in tomato based agro-allied food companies in Nigeria.

Keywords: Knowledge creation, knowledge transfer, knowledge use, product development, tomato-based, agro-allied.

Introduction

A product is one of the four elements of the marketing mix; the other three being price, place, and promotion, which are all geared towards serving and satisfying the target

market. A product is the basic element of marketing mix because it forms the basis for the determination of the other elements. The word “Product” has several meanings, but it is generally a bundle of satisfaction that

customers purchase or patronize in order to solve a problem. A product consists of both goods and services which could be tangible or intangible in nature (Kuka, 2018). A product that is tangible can be directly touched, seen and even be tasted while an intangible product can't be touched or seen but its effect can be felt. For instance, Tomato products are tangible products produced by companies with characteristics including content, package, price, and many more.

Musa (2018) defines a product as the sum of the physical and psychological satisfactions the buyer receives when he makes a purchase. A product can also be described as anything that can be offered to a market for attention, acquisition, use, or consumption that might satisfy a want or need including physical objects and good or services provided to customers. Product development is an ongoing practice in which the strategic level of the organization is looking for opportunities for new products and services.

Product development has been defined as the process of delivering a new product or improving the quality of an existing product for customers (Jelilov & Bahago, 2017). Product development typically refers to all stages involved in bringing a product from concept or idea generation through market release, testing and consumer feedbacks. In other words, product development incorporates the entire journey of a product. It gives companies a way to explore new product ideas, learn what customers want in the early stages of conceptualization and help ensure that the new or enhanced product satisfies a real customer need and equally help organizations achieve business goals. Globally, new ideas that lead to new technology spring up every day, correspondingly changing the need and demand of consumers while ultimately

giving rise to a need for product development (Hughes, 2021).

Some factors that are considered before the product is commercialized include: Introduction timing; For instance, if the economy is down, it might be wise to wait until the following year to launch the product. However, if competitors are ready to introduce their own products, the company could push to introduce the new product sooner. Some of such factors depend on the level of knowledge acquired by such company which could be directly or indirectly affected by the organizations relationships to encourage knowledge creation and transfer.

All these factors can be improved to give a product a better acceptability and patronage in the market place. Besides, there are numerous indigenous firms that have launched their brands although most of them are still battling to break even. Tomato product processing companies in Nigeria include Erisco food, Sonia foods industries ltd, Dangote tomato factory Kadawa, tomato Jos, Kaduna, tasty tom, De Rica and Festin produced by Olam International while the foreign counterpart include; Gino, St Rita, Vitalis, etc.

Statement of the problem

Successful new product development is necessary for the survival of any production organizations. In order to survive and achieve their goals and objectives, it behooves that product organizations systematically adapt to changing needs of the consumers and create products that meet their yearnings and desires. The contributions of the tomato based agro allied companies in Nigeria cannot be overemphasized because nearly every household consume tomato product on daily basis.

A study conducted by a commercial bank in Nigeria discovered that 75 per cent

of Nigeria's tomato paste products originate from China which had been in this business since 2009. This may be due to the fact that there are only a few indigenous tomato-based companies in Nigeria and most of them repackage rather than produce. While it is somewhat difficult to ascertain the contribution of knowledge components in tomato production in Nigeria, it cannot be overemphasized that it is critical that relevant knowledge be created, stored, shared and used to facilitate the process of product development in the tomato producing firms in Southwest, Nigeria. The current study therefore seeks to investigate the factors militating against product development in tomato based agro-allied food companies in Nigeria

Research objectives

The main objective of this study is to examine the barriers associated with product development in tomato based agro-allied food companies in Nigeria. The specific objectives are set to:

1. Investigate product commonly developed in tomato based agro-allied food companies in Nigeria.
2. Determine the level of product development in tomato based agro-allied food companies in Nigeria.
3. Find out factors militating against product development in tomato based agro-allied food companies in Nigeria

Research questions

The following research questions guide the conduct of this study:

1. Which products are commonly developed in tomato based agro-allied food companies in Nigeria?
2. What is the level of product development in tomato based agro-allied food companies in Nigeria?

3. What are the factors militating against product development in tomato based agro-allied food companies in Nigeria?

Review of related literature

Agro-allied companies have been described as a collection of companies engaged in a high-scale production, processing and packaging of food with the use of modern equipment and methods aimed at achieving these goals (Uganneya, Ape & Ubagir, 2013). The industry acquires relevant sophisticated equipment for processing, packaging and storing of food and beverages to generate revenue and improve per capita food consumption (Adesiyan, 2015). Agricultural products can be categorized into cereals and other food crops such as roots, tubers and plantains, in particular, which form the basis of the food systems in the different regions of Nigeria; animal products; fishery products; and the main export subsectors. It also includes forestry products and on the retailers of cereals, beans and pulses, fruits and vegetables, fish and other sea-foods, meat and poultry products.

Agro-allied companies have a vast and immeasurable agricultural product which serve as input for processing ranging from cash crops such as beans, sesame, cashew nuts, cassava, cocoa beans, ground nuts, gum Arabic, kola nut, maize (corn), melon, millet, palm kernels, palm oil, plantain, rice, rubber, sorghum, soybeans, yams, vegetable, tomato and pepper to animals, veterinary services etc. (Jelilov & Bahago, 2017). Several million metric tons of these agricultural products are exported every year. Furthermore, agro-allied companies are generally involved in agricultural consulting, fertilizer manufacturing and sales, fish import and export, livestock feeds and feed millers, ocean trawling, shrimping and fishing,

poultry farms and veterinary clinics. The industry generates wealth to the society by providing jobs and generating a flow of currency among companies and individuals.

Tomato is used mainly in the preparation of soup and stew recipes. It is also used as salad vegetable or processed into paste and ketchup for the eating of pasta and chips. Tomato is also a rich source of essential vitamins, like Vitamin A, B, B6 and C, with a high acidic property that brings out other lycopene which is a natural anti-oxidant used in the treatment of high blood pressure and prostate cancer. The seeds of tomato contain fat, which can be extracted and used as salad oil and in the manufacture of margarine and soap. After oil extraction the residual cake is used as livestock feed and manure.

Tomato by-products can be used in animal feeding, but there are differences in their nutritive value for ruminants and non-ruminants, thus affecting their potential utilization in the practice. The inclusion of tomato by-products in animal diets has been reported to have beneficial effects on animal performance and quality of products (milk, meat and eggs), but effects are variable. Tomato is majorly produced in northern part of Nigeria under two conditions, rain-fed and irrigated. The irrigated aspect is also divided into two parts; the informal on Fadama lands and the formal used in irrigation schemes (Adamu, 2018). According to Uba (2020), a manufacturer takes raw tomato, used vacuum evaporation through the use of forced circulation evaporators and other chemical combination, processes the raw tomato, in a given way and thereby result in a tomato paste, puree, ketchup, juice, sauce and dried

tomatoes. Tomato processing typically involves activities such as mincing and macerating, liquefaction, emulsification, and cooking (such as boiling, broiling, frying, or grilling); pickling, pasteurization, and many other kinds of preservation, and canning or other packaging. They further described two major processing methods of tomato, which yield a variety of products; the drying (dehydration) and wet milling. Products of drying include dried tomato slices and powdered tomato whereas wet milling results in tomato Paste, tomato jam and juice.

Methods

The study employed survey research design. Multistage sampling technique was used to select respondents for the study in the 23 companies studied. In the first stage, fifteen (15) out of the 23 listed and seven (7) out of the seventeen 17 non-listed tomato processing companies were purposively and conveniently selected for the study. In the second stage, the researcher stratified selected companies into existing three departments; Research and Development, Production and marketing were purposively selected. Finally, simple random sampling technique was used and participants were selected proportionately to the size of each department and a total of 450 respondents were selected. Structured questionnaire was used to collect the data from the respondents. Data were analyzed using descriptive and inferential statistics (multiple regression and t-test) at $P \leq 0.05$.

Results

The results of this study are presented in this section.

Table 1: Respondents' socio-demographic characteristics

Parameter	Classification	Frequency	Percentage
Gender	Male	91	22.2
	Female	318	77.8
	Total	409	100.0
Age range	21-30	27	6.6
	31-40	317	77.5
	41-50	61	14.9
	61-70	4	1.0
	Total	409	100.0
Marital Status	Single	67	16.4
	Married	342	83.6
	Total	409	100.0
Working experience	Below 1 year	16	3.9
	1 - 5 years	295	72.1
	6 - 10 years	93	22.7
	More than 10 years	5	1.2
	Total	409	100.0
Educational qualification	HND	197	48.2
	BSc	112	27.4
	PGD	18	4.4
	M.sc	51	12.5
	PhD	31	7.6
	Total	409	100.0
Is your company listed on the stock market?	No	316	77.3
	Yes	93	22.7
	Total	409	100.0

Table 1 indicates that more than two-thirds (77.8%) of the respondents were females. This suggests that there are more female workers in the tomato based agro-allied companies than male. Also, majority of the respondents (77.5%) were in their 30s that is, 77.5% were between the ages of 31-40 years. This shows that the workforce is predominantly young. Furthermore, 83.6% were married. The large number of married people in this study may imply a lot of family responsibilities which may further cause the staff members to be more

committed to their jobs. The finding may also suggest that the participants are responsible enough to display a sense of maturity in the work place. With regards to years of working experience, more than two-thirds majority (72.1%) have worked for 5 years which may indicate an experienced workforce. In addition, 48.2% were HND holders while degree holders accounting for 27.4% which gives an indication that the workforce is an educated one. Lastly, of the majority of the companies (77.3%) are not

on the list of quoted companies on the Nigerian stock market.

Table 2: Product commonly developed in tomato based agro-allied food companies in Nigeria

Product (multiple response)	Frequency	Percentage
Crushed Italian tomatoes	135	5.9%
Tomato juice	291	12.8%
Tomato Ketchup	227	10.0%
Tomato paste	358	15.7%
Tomato Puree	129	5.7%
Tomato sauce	286	12.6%
Passata	157	6.9%
Sun dried tomatoes	244	10.7%
Tomato fat	161	7.1%
Tomato oil	250	11.0%
Others	37	1.6%

Table 2 reveals that three commonly produced tomato-based products in Nigeria are Tomato paste (15.7%) closely followed by Tomato juice (12.8%) and Tomato sauce (12.6%). Others includes Crushed Italian tomatoes (5.9%), Tomato Ketchup (10%),

Tomato Puree (5.7%), Passata (6.9%), Sun dried tomatoes (10.7%), Tomato fat (7.1%) , Tomato oil (11%) and others (1.6%) respectively. This result shows that most tomato based agro-allied food companies in Nigeria develop mostly tomato paste.

Mobolude Jadesinmi Abolarin, Daniel Babalola and Opeyemi Deborah Soyemi: A survey of the barriers associated with product development in tomato-based agro-allied food companies in Nigeria

Table 3: The level of product development in tomato based agro-allied food companies in Nigeria

	SA F(%)	A F(%)	D F(%)	SD F(%)	Mean	SD
Idea Generation (average mean score)					3.5	0.6
Information gathered from consultation of consumer's need are useful to produce development	232(56.7)	166(40.6)	4(1.0)	7(1.7)	3.5	0.6
Distributors are consulted to gather relevant information on possible new products	185(45.2)	194(47.4)	0(0)	30(7.3)	3.4	0.6
Competitors are often explored to gather information on possible new products/idea	177(43.3)	178(43.5)	12(2.9)	42(10.3)	3.3	0.8
New ideas are filtered and analyzed to choose the good and relevant ones	250(61.1)	150(36.7)	5(1.2)	4(1.0)	3.6	0.6
Building business case (average mean score)					3.3	0.7
Development of a product concept is adequate	209(51.1)	174(42.5)	10(2.4)	16(3.9)	3.4	0.7
Clear meaning to all concept involved is given	126(30.8)	241(58.9)	15(3.7)	27(6.6)s	3.2	0.7
Intensive and intentional market research is always carried out	126(30.8)	229(56.0)	30(7.3)	24(5.9)	3.1	0.8
Market research data is analysed to make decision on product(s)	207(50.6)	177(43.3)		25(6.1)	3.4	0.6
Development stage (average mean score)					3.2	0.8
Concepts are presented symbolically	170(41.6)	167(40.8)	32(7.8)	40(9.8)	3.2	0.9
Concepts are presented physically	149(36.4)	207(50.6)	14(3.4)	39(9.5)	3.2	0.7
Model/prototypes are created or selected end users	136(33.3)	212(51.8)	30(7.3)	31(7.6)	3.1	0.8
Samples are tested among end users	180(44.0)	187(45.7)	15(3.7)	27(6.6)	3.3	0.8
Testing stage (average mean score)					3.4	1.5
Products are tested with actual customers	197(48.2)	173(42.3)	18(4.4)	21(5.1)	3.3	0.8
Products are tested in realistic market settings	167(40.8)	200(48.9)	2(.5)	40(9.8)	3.3	0.7
Feedbacks are captured on products	194(47.4)	171(41.8)	20(4.9)	21(5.1)	3.6	3.6
Possible distribution channels are explored	170(41.6)	175(42.8)	30(7.3)	34(8.3)	3.2	0.9
Full Launch or commercialization (average mean score)					3.3	0.8
The time to introduce products to the market is strategically picked	191(46.7)	193(47.2)	4(1.0)	21(5.1)	3.4	0.6
Product launch is strategically planned	159(38.9)	190(46.5)	34(8.3)	26(6.4)	3.2	0.9
Various promotional and advertising strategies to introduce products is adopted	160(39.1)	202(49.4)	24(5.9)	23(5.6)	3.2	0.8
Packaging to appeal to customers	187(45.7)	156(38.1)	22(5.4)	44(10.8)	3.2	0.9
Overall average mean					3.32	

Decision rule: mean score between 1.0-2.0 = low

2.1-2.9 = moderate

3.0 -3.5 = high

Above 3.5 = very high

Criterion mean = 3.0

Table 3 shows the five level of product development in tomato based agro allied food companies in Nigeria. It revealed an overall high level of product development with an overall average mean of (mean =

3.32) on the scale of 4points. Besides, it indicates that idea generation was rated highest among other product development stages (mean = 3.5), followed by Testing stage (mean = 3.4) and building business

Mobolude Jadesinmi Abolarin, Daniel Babalola and Opeyemi Deborah Soyemi: A survey of the barriers associated with product development in tomato-based agro-allied food companies in Nigeria

case (mean = 3.3), full launch or commercialization (mean = 3.3) while development stage comes last (mean = 3.2), This imply that the level of product

development in tomato based agro-allied food companies in Nigeria is high.

Table 4: The factors militating against product development in tomato based agro-allied food companies in Nigeria

	SB	B	MB	SB	NB	Mean	SD
Decrease in sales due to sluggish exports	187(45.7)	123(30.1)	56(13.7)	20(4.9)	23(5.6)	4.1	1.1
Decrease in local market sales	117(28.6)	184(45.0)	55(13.4)	30(7.3)	23(5.6)	4.1	2.7
Reduction in sales due to higher prices	137(33.5)	143(35.0)	88(21.5)	37(9.0)	4(1.0)	3.9	1.0
Reduction in sales due to exchange rate fluctuations	155(37.9)	147(35.9)	55(13.4)	48(11.7)	4(1.0)	4.0	1.0
Insufficient production capacity due to lack of facilities	139(34.0)	140(34.2)	76(18.6)	26(6.4)	28(6.8)	3.8	1.2
Lack of progress in building sales (service) network	138(33.7)	145(35.5)	78(19.1)	45(11.0)	3(0.7)	3.9	1.0
Increase in personnel expenses	130(31.8)	141(34.5)	101(24.7)	27(6.6)	10(2.4)	3.9	1.0
Higher interest rates	138(33.7)	170(41.6)	74(18.1)	17(4.2)	10(2.4)	4.0	1.0
Insufficient price increase	139(34.0)	167(40.8)	68(16.6)	28(6.8)	7(1.7)	4.0	1.0
Increase in fuel costs and utilities (electricity, gas, etc.)	159(38.9)	135(33.0)	47(11.5)	48(11.7)	20(4.9)	3.9	1.2
Difficulty in local procurement of parts and raw materials	159(38.9)	142(34.7)	56(13.7)	49(12.0)	3(0.7)	4.0	1.0
Difficulty inequality control	136(33.3)	174(42.5)	62(15.2)	33(8.1)	4(1.0)	4.0	0.9
High customs duties on imported capital goods and intermediary good	162(39.6)	146(35.7)	80(19.6)	17(4.2)	4(1.0)	4.1	0.9
Stricter environmental regulations	127(31.1)	139(34.0)	82(20.0)	46(11.2)	15(3.7)	3.8	1.1
Electric power shortage	151(36.9)	126(30.9)	58(14.2)	44(10.8)	30(7.3)	3.8	1.2
Inadequate logistics infrastructure	120(29.3)	169(41.3)	70(17.1)	37(9.0)	13(3.2)	3.8	1.0
Average mean score						3.94	1.14

Decision rule: mean score between 1.0-2.0 = low
 2.1-2.9 = moderate
 3.0 -3.5 = high
 Above 3.5 = very high
Criterion mean = 3.0

Table 4 shows factors militating against product development in tomato based agro-allied food companies in Nigeria. It reveals an average mean score of all factors having (mean = 3.94). Besides, the mean score of the highlighted factors ranges from sluggish exports (mean = 4.1), local market sales (mean = 4.1), custom duties (mean=4.1),

exchange rate fluctuation (mean = 4.0), high interest rate (mean = 4.0), price increase (mean = 4.0), procurement of parts (mean = 4.0), inequality control (mean=4.0), lack of progress (mean = 3.9), increase in personnel expenses and increase in fuel (mean =3.9) and lastly lack of facilities, stricter environmental regulations, electric power

Mobolude Jadesinmi Abolarin, Daniel Babalola and Opeyemi Deborah Soyemi: A survey of the barriers associated with product development in tomato-based agro-allied food companies in Nigeria

shortage, inadequate logistics (mean = 3.8). This implies that the tomato based agro allied companies in Nigeria is faced with a lot of factors that can affect its ability to improve its product development.

Conclusion

Findings from this research indicated that the three commonly produced tomato based agro-allied food companies in Nigeria are Tomato Paste closely followed by Tomato juice and Tomato sauce. Hence, actors and stakeholders in the tomato based agro-allied food companies in Nigeria should be commended for their efforts in sustaining tomato based agro-allied products in the country. The paper recommended that policy makers and heads of production departments of these companies should give more attention to production of other products for increase sales of agricultural products in tomato based agro-allied food companies in Nigeria.

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