



Consumer perceptions of processed bean products: Insights from the precooked beans project in Nairobi, Kenya

Babirye, I. ^{1*}, Nakazi, F. ², Bonabana, J. ³, Elepu, G. ³, Nkalubo, S. ¹ and Ugen, M. ⁴

¹National Crops Resources Research Institute, Legumes Department,
P.O. Box 7084, Kampala, Uganda

²Economic Policy Research Centre (EPRC), Makerere University, P.O. Box 7062,
Kampala, Uganda

³Makerere University College of Agriculture and Environmental Science,
Department of Agribusiness and Natural Resource Economics,
P.O. Box 7062, Kampala, Uganda

⁴National Semi-Arid Resources Research Institute, Uganda

*Corresponding author: imbabirye@gmail.com

Abstract

There have been various efforts to develop a range of precooked bean products including quick-cooking beans, bean flour, ready-to-eat bean snack bars, bean noodles, and bean chunks in a bid to address consumers' need for quick-cooking beans. However, there is lack of information on consumer perceptions and attitudes towards such processed bean products that have been introduced on the market. Using a sample of 36 consumers out of the 60 respondents who consented to consuming processed bean products in a nutrition survey, the study examined the level of consumer perceptions of processed bean products in Kenya. A MANOVA and multivariate regression were applied to examine the consumer's perceptions of various processed bean attributes including food safety, proper packaging, ease of serving, energy-saving, time-saving, fair pricing, and nutrition. Results revealed that baked and canned beans were considered more energy-saving and time-saving but were perceived as non-nutritious and less safe. Bean flours were perceived as cheap but not well packaged or energy-saving. Processed bean products sold at the retail shops were relatively cheap (34% less) compared to

those from supermarkets. Factors such as place of purchase: retail shops, imported; and main consumer: notably men only explain 54.79% of the variances in prices for processed bean products. As the consumption landscape of processed bean products evolves, these findings serve as a valuable foundation for informed industry-level interventions aimed at promoting the consumption of locally produced, nutritious, and safe bean products.

Key words: Baked and canned beans, bean flour, consumers, energy saving, preparation time, prices, MANOVA, nutrition, safety

Introduction

Throughout the world, major shifts in dietary patterns are occurring, even in the consumption of basic staples towards more diversified diets (Kearney, 2010; Chauvin *et al.*, 2012; Holmes *et al.*, 2018). This is mainly attributed to urbanisation, more time to work, and food industry marketing (Kearney, 2010). For beans which contribute the highest percentage of proteins to the large population in sub-Saharan Africa (SSA), their annual production is tremendously growing, surpassing crops like ground nuts and peas to meet the increasing need for proteins (Abebe and Zemedu, 2019; PABRA, 2021). In East Africa where beans make up a greater share of almost every meal, consumption of dry beans necessitates prior preparation of about 2 hours before a meal is served and consumed, which constrains the consumption and demand for beans (Aseete *et al.*, 2018).

Consumers have devised different means of fast cooking the bean varieties of their choice by soaking them overnight, adding cooking catalysts, and removing parts of the bean grains that are believed to cause a long cooking time such as the seed coat (Aseete *et al.*, 2018). Despite various bean preparation innovations, time and extra effort are still needed. For instance, soaking beans overnight takes an overnight preparation so as to consume beans, and using cooking catalysts needs prior preparation (Aseete *et al.*, 2018).

Amidst the myths and perceptions that processed and fast foods lack nutritional value, contain lots of artificial ingredients (Cardello *et al.*, 2007), the trend of consumption of quick-cooking plus already-cooked foods is continuously increasing and tending to surpass that of staples like beans. Efforts by individual consumers, food companies, and researchers have been made to reduce the cooking time of beans. The national legumes program for Uganda for example has through breeding, developed quick-cooking varieties that only take 45 to 60 minutes to cook. However, middle-class consumers still consider the 45 to 60 minutes to be a lot of time (Larochelle *et al.*, 2015). In Kenya, the Pre-Cooked Beans project developed a

range of up to five precooked bean products including quick cooking beans, bean flour, ready-to-eat bean snack bars, bean noodles, and bean chunks used as ingredients in various products like bread (Aseete *et al.*, 2018; Ugen *et al.*, 2021). Before the introduction of precooked bean products on the market, there existed a number of other processed bean products on the Kenyan market (Babirye, 2019; Babirye *et al.*, 2023); therefore precooked beans have been added to supplement the pre-existing processed bean products.

The precooked bean products were distributed through various outlets, including supermarkets (one in Uganda), 120 food kiosks, food vendors, and residential areas in Nairobi (Ugen *et al.*, 2021), using a mix of various marketing strategies as recommended by Nakazi *et al.* (2019). An ex-ante-demand analysis by Aseete *et al.* (2018) showed that consumers in Uganda are willing to pay for these new processed bean products, and studies in Kenya showed that *beansy*TM (quick cooking precooked beans, bean flour, bean snacks, and bean noodles) were the most traded (Ugen *et al.*, 2021). Furthermore, a study on the frequency of consumption of the introduced precooked beans showed that the frequency of consumption of precooked beans is influenced by the presence of children under five in the household, nutrition knowledge about the precooked beans, as well as the household size (Mutegi *et al.*, 2023).

However, little is known about the consumer preferences for and among the existing processed bean products; and the perceptions and attitudes surrounding the processed beans that exist on the market. Available studies (Byarugaba *et al.*, 2020; Lutomia *et al.*, 2021) on the existing and new (precooked products) have focused more on sensory evaluations by random groups of individuals to predict preference and perceptions. Other studies have not looked at consumer perceptions and attitudes but focused on the frequency of consumption (Mutegi *et al.*, 2023), barriers to consumption (Mukamugema *et al.*, 2019) and willingness to pay for processed bean products (Aseete *et al.*, 2018; Chege *et al.*, 2019). This study sought to generate information on perceptions towards the consumption of processed bean products by consumers using a set of established actual processed bean consumers from metropolitan Nairobi in Kenya. Specifically, the study aimed (i) to assess consumer perceptions of processed bean products and (ii) to identify and analyse factors influencing consumer perceptions of processed bean products. Such information would guide all those stakeholders involved in the expansion of new processed bean products in the region.

Methodology

Study design and data collection

The study was based upon knowledge of the existence of real processed bean consumers and it followed a multi-stage sampling procedure. In the first step, a follow-up was on 60 respondents who consented to having consumed processed bean products in a Nutrition study conducted by the Center for Tropical Agriculture (CIAT) and the Kenya Agriculture and Livestock Research Organization (KALRO) in 2015. The cross-sectional household survey of 2015 was carried out to assess factors that could limit bean consumption among potential consumers of the pre-cooked bean product and its variants and included households from Nairobi, Machakos and Kiambu (Ugen *et al.*, 2017). Consent was sought from CIAT to do a follow up on the consumers who had taken part in their study and a request to avail data pertaining to the names, telephone contacts and demographic information was accepted and information provided by the data manager.

All the 60 individuals were called and asked questions to recall the survey they had participated in and to ascertain if they had understood and responded correctly to the questions concerning processed bean consumption. In order to ensure that participants did not mix up our study with other surveys and to avoid recall biases, we asked all 60 participants to report the number of surveys they had taken part in. For those who had participated in other surveys, we provided a clear explanation of the particular study we wanted them to recall and also explained the particular questions for which they had provided the answer to. They were also asked the number of times that they consumed processed beans since the time of the previous survey to prove that they were real consumers. Out of the 60 respondents only 36 were established as real processed bean consumers. We selected consumers who were regularly consumed processed bean products, they were not occasional or random consumers. It is to this group that the questionnaire about processed bean consumption was administered. Informed consent was also sought from the 36 respondents prior to taking part in the study and all of them willingly accepted.

Both qualitative and quantitative data were collected from these respondents. Secondary data about these was also generated from the previous survey and added to the information that had been collected for instance, the classification of settlement types had been done based on Living Standards Measurement (LSM), population density and concentration of services. Data collected included information on the current physical address, distance of the home to the nearest market/ trading centers, current household size, types of processed bean products consumed, number of times they are consumed in a month/year, prices of the products if bought, family

members for whom they are targeted among others, and hindrances to the consumption of processed beans among other information.

Data analysis

Descriptive statistics such as percentages and means were used to describe and characterise processed bean consumers. Statistical tests such as t-tests and F-tests were carried out to measure the association between parameters. To determine the consumers' perceptions with processed beans, a prolonged two stage analysis was undertaken. First, the Mean Attribute Scores (MAS) of various processed bean attributes were computed. The attributes that were considered included Quality and safety (food safety, packaging) conveniency (ease of serving, time saving and energy-saving), pricing, and national aspects. The attributes were measured on a 4-point scale with 1= strongly agree, and 4=strongly disagree with each score representing a consumers' level of agreement about the number of stated statements for each processed bean attribute. MAS were computed for each attribute by aggregating consumers' scores given to the attribute statements and divided by the total number

of respondents. i.e $MAS = \frac{\sum x_i}{N}$, where x_i is the score given by the consumer to the individual attribute and N is the total number of consumer respondents. The attributes considered and their scale of measurement are given in Table 2a.

In the second stage, a two-way MANOVA was used to determine the effect of place of purchase and main consumer of the product in the home, on the price paid for the product and quantities of the product bought. And thereafter a multivariate regression was applied to assess the degree of effect of the predictors and obtain the estimates of coefficients in the model. Since some consumers had bought and consumed more than one product, observations for the additional products bought and consumed were added and treated separately for each of these consumers. For the place of purchase, since the most documented channel for selling processed foods in developing countries is through supermarkets (Odunitan-Wayas *et al.*, 2018; Granado *et al.*, 2021; Babirye *et al.*, 2023), supermarkets were taken as the base while retail shops and consuming obtained through other means (for example directly imported or given) were among the predictors. When it came to the main consumer, all family members consuming was the base because they are anticipated to benefit the whole family while children alone, men alone and adults alone were the predictors. Only products that had undergone secondary processing methods were considered for this study, as such dry beans sorted and packaged were not considered processed in this study. Consumers indicated that they still required the same preparation time as regular dry beans, with only the packaging being different.

Results

Descriptive statistics of processed bean consumers

Results reveal that consumption of processed beans was high among consumers living in peri-urban settings (80%), who are young (average age of 30 years), married (83%), educated (11 years) with small family sizes (4 members) and at least two working family members (Table 1a). More than half (52%) of the consumers consumed canned beans (with sauce), 24% baked beans (with no sauce), and another 24% bean flours (Table 1b). Processed bean consumers, lived close to shopping centers (1.1 Km) and more than half (51%) consumed processed beans at least once in a month (0.8kg per meal) while the 49% were not consistent in the consumption, but acknowledged consuming processed bean products at least 4 times in a year. The average price per kilogram of processed bean products at that time was 1.92 US dollars, with bean flours costing 0.95 US dollars, baked beans costing 1.42 US dollars, and 2.51 US dollars for canned beans (Table 1b).

Table 1a. Demographic and descriptive characteristics of processed bean consumers (n=36)

Continuous characteristics		Mean (S.D)	Minimum	Maximum
Age (Years)		30.41(10.87)	19	78
Time spent in school (Years)		11.94(3.27)	8	18
Nearest market/trading center (KM)		1.08(0.76)	1	3
Family/household size (Persons)		4.47(2.10)	2	12
Working household members (Persons)		2.61(1.15)	1	7
Number of dependents (Persons)		1.86(1.31)	0	5
Categorical characteristics		Percentage		
Sex	Male	13.89		
	Female	86.11		
County	Nairobi	66.67		
	Machakos	22.22		
	Kiambu	11.11		
Location	Urban	19.44		
	Peri-urban	80.56		
Marital status	Married	83.33		
	Never married	13.89		
	Separated	2.78		

More than half (52%) bought processed bean products from supermarkets, 19% bought them from retail shops or local shops/ kiosks in the trading centers while 27% consumed products manufactured in other countries (imported) either as bought or given (Table 1b). The majority (72%) of the consumers bought processed bean products to be consumed by all household members regardless of age while a small proportion (22%) of consumers purchased processed bean products mainly for the children aged 5 years and below in the household (Table 1b). Although the majority of the respondents (62.1%) had no concerns with regards to the consumption of processed beans, a few identified high price as the major concern (21.6%), and the unavailability (8.1%) of the products when they are needed, particularly noted with baked and canned bean products. A few (5.41%) of the consumers also expressed their concerns about the additives used in the preservation of the shelved stable canned processed beans (Table 1b).

Table 1b. Characteristics of the processed bean products consumed

	All (n=41)	Flours (n=10)	Baked (n=10)	Canned (n=21)
Price per kg (US dollars)	1.92	0.96	1.42	2.51
Average quantities consumed (kg)	0.86(0.63)	1.30(0.79)	0.44(0.37)	0.57(0.70)
Place of purchase (%)				
Supermarket	52.78	20.00	30.00	76.19
Imported	27.78	0.00	60.00	23.81
Retail shop/kiosks	19.44	80.00	10.00	0.00
Target consumer in the household (%)				
All members	72.22	30.00	100.00	71.43
Children below 5	22.68	70.00	0.00	14.29
Adults only	5.10	0.00	0.00	14.28
Main constraint to consumption (%)				
None	62.16	70.00	60.00	61.9
High price	21.62	30.00	20.00	19.05
Unavailability	8.11	0.00	20.00	4.76
Additives	5.41	0.00	0.00	9.52
Health concerns	2.70	0.00	0.00	4.76
Would recommend consumption (%)				
Yes	83.76	100.00	80.00	76.19
No	16.22	0.00	20.00	23.81

Consumer perceptions towards the processed bean products

Despite being perceived as safe for consumption (1.4), bean flours were found to be poorly packaged (3.01) (Table 2b). Contrarily, baked and canned beans were regarded as well packaged (mean rating, 1.4), but still consumers expressed some reservations concerning the safety of canned and baked products for them and the family (mean rating, 2.6, 2.0, respectively) (Table 2b). Consumers reported undergoing a notable degree of inconvenience when serving bean flours, with a mean rating of 3.1 and perceived bean flours as not particularly energy-saving (mean rating 3.0) (Table 3). In contrast, baked and canned beans were widely perceived as highly energy-efficient (mean ratings of 1.1 and 1.2, respectively). Additionally, these products were perceived as time-saving during preparation (mean ratings of 1.2 and 1.3), with some consumers noting that they could be consumed conveniently on the go. However, they were generally perceived as having a higher price point. In essence, consumers deemed these processed bean products to be relatively more expensive, taking into account the value they associated with the products in contrast to consuming the traditional dry, unprocessed beans. Consumers held a common perception that the processed bean products they consume might not be as nutritionally adequate as desired. This is evidenced by the mean ratings, which indicate a skepticism regarding their nutritional value, especially for canned beans (3.0), and baked beans (3.2) (Table 2b). As such, consumers tend to question the overall nutritional quality of these processed bean products.

There was a statistically significant difference between the place of purchase as well as the overall effect for the model of the place of purchase and main consumer on the combined dependent variables price and quantity bought, $F(2;35) = 6.40$, $P = .0002$; and $F(5;35) = 3.85$, $P = .0004$, respectively (Table 3). The univariate model for price was statistically significant and the 5 predictor variables (place of purchase; retail shops, imported, main consumer; children, men only, adults only, quantity), the interaction of place of purchase and main consumer explain 54.79% of the variances in price, and only 8% in the variance in quantity bought (Table 4). The price of each additional unit of products bought from retail shops was 34.38% (0.66 US dollars) less than that bought from supermarkets, and the price of each additional unit imported from other countries was also less by 15.63% (0.3 US dollars) compared to that of local products in supermarkets (Table 4). This is line with the descriptive statistics (Table 2b) which indicate the prices of flours and baked products being lower than those of canned which are particularly imported and sold in supermarkets. If the product were to be consumed by men only in the home, each additional unit would be more likely to be bought at 0.85 US dollars more than if it were to be consumed by all individuals in the home.

Table 2a. Attributes considered and their scale of measurement

Attribute	Statement	Scale
Food safety	Consumption of Processed beans is safe for your health and your family	1=strongly agree, 4=strongly disagree
Packaging	Processed beans are safely packed	1=strongly agree, 4=strongly disagree
Easy of serving	Processed beans are easy to serve to the family compared to unprocessed beans	1=strongly agree, 4=strongly disagree
Time-saving	Processed beans save the consumers time during preparation	1=strongly agree, 4=strongly disagree
Energy saving	Processed beans save energy during preparation	1=strongly agree, 4=strongly disagree
Price	The price of processed beans is fair compared to the value derived	1=strongly agree, 4=strongly disagree
Nutritious	Processed beans are more nutritious than unprocessed beans	1=strongly agree, 4=strongly disagree

Table 2b. Mean attribute score for the perceptions on different processed bean products

Attribute	Bean flours	Baked beans	Canned beans
Food safety	1.4	2.0	2.6
Well packaged	3.1	1.4	1.4
Easy to serve	3.0	1.6	1.3
Energy saving	3.0	1.1	1.2
Time-saving	2.4	1.2	1.3
Fairly priced	2.4	3.1	2.7
Nutritious	2.0	3.2	3.0

(1 = strongly agree, 4 = strongly disagree; Values tending to 4 indicate divergence with the attribute for a given processed bean product)

Table 3. MANOVA: Impact of place of purchase and main consumer on price and quantity consumed (Number of Observations = 41)

Source	Statistic	Df	F (df1, df2)	F	Prob>F			
Model	W	0.408	5	10	68	3.85	0.000	e
	P	0.632		10	70	3.23	0.002	a
	L	1.354		10	66	4.47	0.000	a
	R	1.278		5	35	8.95	0.000	u
Residual			35					
Place of purchase	W	0.523	2	4	68	6.40	0.000	e
	P	0.494		4	70	5.75	0.000	a
	L	0.852		4	66	7.03	0.000	a
	R	0.799		2	35	13.98	0.000	u
Main consumer	W	0.761	3	6	68	1.66	0.144	e
	P	0.241		6	70	1.59	0.162	a
	L	0.314		6	66	1.72	0.129	a
	R	0.309		3	35	3.61	0.023	u
Residual			35					
Total			40					

e = exact, a = approximate, u = upper bound on F; W = Wilks' lambda; L = Lawley - Hotelling trace; P = Pillai's trace; R = Roy's Largest root

Discussion

Study findings show that the consumer's perceptions of processed bean products are influenced by a number of factors mainly relating to alterations to the original products as well as their sociodemographic characteristics. This is just in line with an earlier study by Sajdakowska *et al.* (2018) who found that the socio-demographic characteristics of consumers significantly influenced the acceptance of technologies used to improve the nutritional value of cereals. In a seemingly similar study, Vidigal *et al.* (2015), also concluded that socioeconomic factors played a significant role in the consumer's neophobia levels and attitudes to food processed with new and conventional technologies. In this study, findings of consumer perceptions categorised into quality and safety, convenience, price, and nutritional perceptions based on the socio-demographic and economic characteristics are discussed.

Table 4. Multivariate regression model results

Equation	Observations	Parameters	RMSE	R squared	F	P
Price	41	6	58.6253	0.5479	8.4816	0.0000
Quantity	41	6	0.7412	0.0839	0.6407	0.6702
			Coefficient	Standard Error	t-value	
Price	Place					
		Retail shop	-132.4238***	28.32603	-4.67	
		Imported	-61.48772***	22.46284	-2.74	
	Main consumer					
		Children	5.508312	25.55095	0.22	
		Men only	170.7964***	60.26899	2.83	
		Adults only	-56.89874	43.05712	-1.32	
	Constant	229.2036***	13.97931	16.40		
Quantity	Place					
		Retail shop	0.4106366	0.3581167	1.15	
		Imported	-0.2165801	0.2839904	-0.76	
	Main consumer					
		Children	-0.0313859	0.3230324	-0.1	
		Men only	-0.3260676	0.7619612	-0.43	
		Adults only	-0.1189971	0.5443571	-0.22	
	Constant	0.8260676***	0.1767359	4.67		

*** significant at 99% confidence level; Supermarket was the base for place, and all family members the base for main consumer

Quality and safety perceptions

Baked and canned beans were perceived to be well packaged and easy to serve while bean flours were perceived as poorly packaged mainly in plastics and unappealing packages. Packaging has been documented to greatly impact acceptance of foods and considered a great attribute in other processed foods valuations and consumer studies (Guiné *et al.*, 2016; Elepu, 2018). The poor packing of bean flours noted by consumers could deter consumption as consumers are becoming aware of the need to save the environment and avoid plastics. Effective packaging encompasses various aspects, including the choice of materials and informative labeling, which plays a critical role in providing consumers with the necessary information about the processed product. However, it is important to note that comprehensive

packaging can increase production costs, potentially leading to higher selling prices, which may affect product desirability among consumers. Thus, stakeholders considering entry into the processed bean production industry should carefully consider the appropriate packaging materials as a means to address both environmental concerns and consumer information needs.

Consumer showed a certain level of skepticism towards the safety of canned beans compared to bean flours and baked beans. This could be due to the noted constrain of canned beans having additives and preservatives to increase their shelf stability. This is line with Winham *et al.* (2019) who found that dry beans were more preferred to canned beans among the low-income women with over 48% of women stating that canned beans had preservatives. Sustainable consumption by consumers can be enhanced if the information is provided to indicate that no harmful substances and means have been used to extend the product shelf life (Winham *et al.*, 2019; Ćemiglak-Krajewska *et al.*, 2020). Interestingly, Vidigal *et al.* (2015) found that older and less educated individuals seek safer and more known foods compared to the young and educated, it is, therefore, no wonder that in this study the consumers of processed beans as indicated in the results were the educated and mainly in the youthful stage. Nevertheless, there is need to ensure that consumers seeking safe foods are catered for and hence the need to address the issues regarding safety of processed foods.

Convenience perceptions

Results show that the majority of the processed bean consumers were mainly peri-urban dwellers. The young adults, educated and peri-urban dwellers have been documented to be first adopters especially for new innovative and time-saving technologies. In their study “Consumer demand heterogeneity and valuation of value-added pulse products: a case of precooked beans in Uganda” Aseete *et al.* (2018) noted that urban bean consumers relied heavily on the market as compared to home produce. They concluded that due to the high reliance of urban consumers on the market, precooked beans stood a higher chance.

Earlier studies have found that married women, and most processed food consumers mainly purchase the processed foods due to convenience (Kim and Ju, 2018; Lutomia *et al.*, 2021) and this could explain why processed beans were found to be consumed by married-educated and working women. These usually have less time at their disposal to prepare traditional and painstaking meals for their families and end up consuming processed (precooked) beans for their convenience purposes.

Cooking fuels are also usually much more expensive in the urban areas (Mishili *et al.*, 2011) where the majority of the processed food consumers were found. Processed

bean products that need little energy for warming or customising, like canned and baked beans, are therefore considered energy-saving unlike the flours and dry beans.

Nutritional perceptions

The results indicated that even among an educated sample of participants, there was a perception that canned and baked beans were not sufficiently nutritious. This perception may be attributed to several factors, primarily the absence of comprehensive nutritional information and clear labeling on these processed bean products. The lack of informative packaging may have left consumers with inadequate knowledge about the nutritional content and value of these products. Our findings are in agreement with Cardello *et al.* (2007), Odunitan *et al.* (2018), and Sajdakowska *et al.* (2018) who found that even individuals who are highly educated and well aware about the nutritional composition of certain foods may have greater skepticism regarding the consumption of highly processed foods. This knowledge gap can result in skepticism regarding the nutritional adequacy of canned and baked beans.

Another potential factor contributing to this perception is the alteration in form and the use of additives in these processed bean products. Changes in product form or the inclusion of additives can introduce a level of bias among consumers, particularly when it comes to assessing their nutritional quality (Winham *et al.*, 2019). Consumers may hold a preference for more natural or less processed forms of beans, assuming them to be more nutritious. This preference aligns with the notion that minimally processed foods are often perceived as healthier and more natural. The study findings collaborate with Mutegi *et al.* (2023) who found nutritional knowledge on consumption frequency for precooked bean products to have a positive influence on the consumption frequency for such products in Machakos County.

Price perceptions

Results of the Multivariate model showed that purchasing from retail shop, consuming imported products, and men only consuming variables explain the changes in the price of the processed beans. The price of any food product is a key element in its marketing strategy (Ding *et al.*, 2010), and food items price can deter purchase if it is exorbitantly high compared to that of its competitors; and price comparisons are not taken necessarily as quality comparisons (Imkamp, 2018). In pricing the products, processors should consider the marketing avenues since it is evident that the place of purchase greatly promotes the product in terms of pricing. In their study, Nakazi *et al.* (2019) found that canned beans are easy to market but the supply price to marketing places were considerably higher than other processed bean products. As such, in country processors should consider the competition from the imported products and create marketing strategies together with the retail outlets that support increased product consumption. This study findings are in line with an earlier study

(Chege *et al.*, 2019) who found that products such as canned and baked were expensive according to consumers and this discouraged their consumption among urban poor families.

Moreover, it is crucial to recognise that processed beans are generally seen as convenient by consumers, despite the other multifaceted challenges observed in this study such as high price, nutrition and safety concerns. Addressing these challenges requires a holistic approach that encompasses both supply and demand factors. This approach should involve price regulation, improved packaging, and sensitisation efforts to correct misconceptions. These findings serve as a valuable foundation for informed policy and industry-level interventions aimed at encouraging the consumption of locally produced, nutritious, and safe bean products.

Conclusion

The consumption of processed bean products has transitioned from relying on imported goods to the consumption of locally manufactured products, which are increasingly accessible in various community settings and in shopping places such as retail shops and supermarkets. However, several significant barriers to the widespread consumption of these products have been identified, and these factors align with the perceptions and socioeconomic characteristics of consumers. Among these barriers, the high cost of processed bean products, coupled with their availability represent a prominent challenge that hinders their consumption. Issues like improper packaging and taste alterations due to additives contribute to misconceptions about safety and nutritional value. These findings emphasize the need for further investigation and targeted interventions to enhance acceptance and consumption among consumers, guiding stakeholders in the expansion of new processed bean products in the region.

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