

Research Application Summary

Consumer acceptability and willingness to pay for potato-based cookies in Uganda

Nantambi, B.,¹ Mugisha, J.¹ & Kajunju, N.H.B. ²

¹School of Agricultural Sciences, Makerere University, P.O. Box 7062, Kampala, Uganda

²Department of Food Technology and Nutrition, Makerere University, P.O. Box 7062, Kampala, Uganda

Corresponding Author: nantambi98@gmail.com

Abstract

Potato (*Solanum tuberosum* L.) is a food and cash crop in Uganda, with a great potential to improve households' nutrition security and income, if processed and commercialised. A set of potato based products, including cookies, biscuits and waffles have been developed but acceptability profiles by potential consumers is yet to be assessed. This study aimed at examining the attributes of the potato-based products that potential consumers prefer, and the factors that influence the prices they are willing to pay for the products in Uganda. A market study was conducted in Southwestern Uganda in the three main urban centres (Kabale, Kisoro and Mbarara) where a total of 600 randomly selected respondents were interviewed. Data were analysed using descriptive statistics and a multiple regression model. Consumers were willing to pay about 1,600 Uganda shillings (US\$ 0.46) per pack of the potato-based cookies. This is an indicator of the likely market entry success given that the producer would breakeven by selling the cookies at 1,000 shillings (US\$ 0.29). The results further show that the price of close substitutes (other cookies and biscuits already in the market) and the distance where cookies are bought were the key factors that would influence the price consumers would be willing to pay for the potato-based cookies. It is concluded that selling the products closer to consumers, increases the price consumers would pay for them. It is therefore recommended that the producer should produce at a relatively low price such that the product is sold at a competitively lower market price than that offered for the current available product.

Keywords: Consumers preferences, price, *Solanum tuberosum*, Uganda

Résumé

La pomme de terre (*Solanum tuberosum* L.) est une culture alimentaire et économique en Ouganda, avec un grand potentiel pour améliorer la sécurité alimentaire et le revenu des ménages, si elle est transformée et commercialisée. Un ensemble de produits à base de pommes de terre, y compris des gâteaux, des biscuits et des gaufres ont été développés mais des profils d'acceptabilité des consommateurs potentiels doivent encore être évalués. Cette étude visait à examiner les attributs des produits basés sur la pomme de terre que préfèrent les consommateurs potentiels et les facteurs qui influencent les prix qu'ils sont disposés à payer pour ces produits en Ouganda. Une étude de marché a été menée dans le sud-ouest de l'Ouganda dans les trois principaux centres urbains (Kabale, Kisoro et Mbarara), où 600 répondants sélectionnés au hasard ont été interrogés.

Les données ont été analysées à l'aide de statistiques descriptives et d'un modèle de régression multiple. Les consommateurs étaient disposés à payer environ 1600 shillings ougandais (0,46 USD) par paquet de biscuits à base de pommes de terre. Il s'agit d'un indicateur du succès probable de l'entrée sur le marché, étant donné que le producteur ferait des bénéfices même en vendant les cookies à 1 000 shillings (0,29 USD). Les résultats montrent davantage que le prix des substituts similaires (autres gâteaux et biscuits déjà sur le marché) et la distance des lieux d'achat des gâteaux étaient les facteurs clés qui influencent les prix que les consommateurs seraient disposés à payer les cookies à base de pommes de terre. Il est conclu que la vente des produits plus accessibles aux consommateurs augmente les prix que les consommateurs sont disposés à payer. Il est donc recommandé que le producteur produise à un prix relativement bas, de sorte que le produit soit vendu à un prix de marché concurrentiel inférieur à celui proposé pour le produit déjà disponible.

Mots-clés: préférences des consommateurs, prix, *solanum tuberosum*, Ouganda

Introduction

Potato (*Solanum tuberosum* L.) is a food crop that provides numerous investment opportunities, given the diversity of value-added products that can potentially be made from the tubers. It is one of the most productive food crops in the world, in terms of its yields of edible energy and good-quality protein (Bártová *et al.*, 2015). Nutritionally, potato is considered a balanced plant food with a good ratio of protein and calories, and substantial amounts of vitamins and minerals (McGill *et al.*, 2013).

In Uganda, potato is mainly consumed as a boiled vegetable, unlike in developed countries where the largest portion of the crop is consumed in a processed form. Value addition is still limited with few processors producing potato chips and crisps (Mbowa and Mwesigye, 2016). Processing potato into high value-added products is constrained by inadequate capital, low-quality ware potato (immature tubers, inconsistency in tuber sizes, and cuts and bruises due to poor harvest practices) and limited supply of desired varieties. As such, potato markets in Uganda have been limited to fresh tubers and few market participants to which the low profitability of the value chain has been attributed (Mugisha *et al.*, 2017). Recently, efforts have been made to process potato tubers into flour, biscuits cookies and waffles based on the assumption that the value of potatoes, especially the tinny tubers would increase farmers' income (Nsubuga *et al.*, 2019).

The overall success in market entry for a new product such as potato flour, biscuits cookies and waffles, is dependent on the level of consumer acceptance for the product (Gurbuz, 2018) which, in turn, depends on the market status and defines the consumers' willingness to pay for the product and continue demanding for it (Okello *et al.*, 2014). Other factors, according to consumer theory, that influence the purchase of a new product include the price of the product, the price of related products (either substitutes or complements), and the socio-economic characteristics of the consumer (Albari and Safitri, 2018). This study aimed at examining the attributes of the potato-based products that potential consumers prefer, and the factors that influence the prices they are willing to pay for the products in Uganda.

Methodology

Prototypes of potato-based cookies produced by the CARP+ project were used to collect market information on consumer preferences and price determining factors. A market study was conducted in Southwestern Uganda in the three main urban centres, Kabale, Kisoro and Mbarara. This area was purposively chosen because potato is a major food and cash crop. In each urban area, 200 potential adult consumers (at least 18 years old) were randomly selected giving, a total sample of 600 respondents. On their consent, the respondents were served with samples of the cookies. A structured questionnaire was administered to collect socio-economic characteristics of the respondent, feedback on the attributes of the cookies including size, colour, shape and taste (mouth feel, crunchiness and sweetness), the quantity they would be willing to purchase and the price they would be willing to pay in comparison to the close substitutes.

The data collected were analysed using descriptive statistics in SPSS software version 22.0. In addition, a multiple regression (OLS) model was estimated to determine the factors that influence the price the consumers were willing to pay for the newly developed cookies. The model was specified as described by (Abdalkrim and Hrezat, 2013) was used for this purpose.

Results and Discussion

Descriptive results of the consumer product attributes and preference are presented in Table 1. The cookies were available in two shapes (circular and star), two colours (dark and light brown), two levels of sweetness (relatively high and low sugar level) and two sizes of the packs (relatively big and small). Majority of the consumers (51.3%) considered taste of the product as the most important determinant factor in decision-making to buy the cookies in Southwestern Uganda. This is consistent with the findings of Breslin (2013) that taste helps consumers decide what to eat and influences how efficiently they use the food they have. This implies, in a complex environment with diverse products having different tastes, consumers regard tasty products as the most attractive and price worthy. As such, better taste means more profits, while compromised product taste implies reduced chances of the product's tradable success in the market place. Results also suggested that other factors such as shape, colour, taste, mouth feel, appearance, piece size, brand name, and packaging material are the attributes that consumers consider while purchasing for the potato-based cookies (Table 1).

Results from a multiple regression model (Table 2) indicate that consumers were willing to pay about 1,610.62 Uganda shillings (US\$ 0.46) per pack of 100 grammes of potato-based cookies. This is an indicator of the likely market entry success given that the producer indicated 1,000 shillings (US\$ 0.29) as the breakeven selling price. The results further show that prices of close substitutes (other cooky types and biscuits already in the market), and the distance where cookies are bought, were the key factors that would influence the price consumers would be willing to pay for the potato-based cookies. For instance, increasing the price of the cookies consumers currently buy would significantly ($P < 0.01$) increase the price they would willingly pay for the potato-based cookies. According to the consumer theory, an individual will shift to a substitute as the price of the commodity increases, provided the substitute gives the same level of utility. The same result is evident for the biscuits that consumers currently buy from the market ($P < 0.05$).

Table 1. Preference by consumers in making choices to buy the new cookies in Southwestern Uganda

Attributes	Frequency	Consumers (%)
Shape of cookie	27	7.6
Colour of cookie	29	8.1
Taste	183	51.3
Mouth feel	16	4.5
Cookie appearance	14	3.9
Piece size	16	4.5
Pack size	5	1.4
Price	43	12.0
Expiry date	9	2.5
Brand name	13	3.6
Packaging material	2	0.6

Increasing the distance to places where cookies are currently bought would significantly $P < 0.05$) affect the price that consumers would be willing to pay for the potato-based cookies (Table 2). This is explained by the consumer substitution effect; ease of access to a commodity that gives a consumer the same level of satisfaction. This suggests that processors should use technologies that reduce the cost of production while producing and supplying the products closer to consumers in order to maximize their profit.

Table 2. Factors influencing the price consumers are willing to pay for the new potato cookies in Southwestern Uganda

Variable	Coefficient	Std. Error	p-value
Constant	1610.626	307.103	
Price of cookies consumers currently buy	0.231	0.052	0.000
Price of biscuits consumers currently buy	0.092	0.044	0.038
Average quantity every time the consumer buys	-1.667	1.267	0.189
Distance where cookies are bought	0.260	0.128	0.043
Consumer's age (years)	0.513	6.598	0.938
Consumer's education level (years of schooling)	6.245	15.056	0.679
Attributes considered when buying cookies	0.622	23.762	0.979
Model	$R^2 = 0.135$	Adjusted $R^2 = 0.108$	$F = 5.13^{***}$

Conclusions

The newly produced potato-based cookies have high potential of entering the market; with attributes closely comparable to those of their close substitutes already in the market. Selling the new cookies closer to consumers increases the price consumers would be willing pay for them. Cookie shape, colour, taste, mouth feel, appearance, piece size, brand name, and packaging material are the attributes that consumers consider while purchasing cookies.

Acknowledgments

The MasterCard Foundation (TAGDev project) through the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), funded this study. This paper is a contribution to the Seventh Africa Higher Education Week and RUFORUM Triennial Conference held 6-10 December 2021 in Cotonou, Benin.

References

- Abdalkrim, G. M. and AL-Hrezat, R. S.I. 2013. The role of packaging in consumers' perception of product quality at the point of purchase. *European Journal of Business and Management* 5 (4): 69-82.
- Albari, A. and Safitri, I. 2018. The influence of product price on consumers' purchasing decisions. *Review of Integrative Business and Economics Research* 7 (2): 328–337.
- Bártová, V., Bárta, J., Brabcová, A., Zdráhal, Z. and Horáková, V. 2015. Amino acid composition and nutritional value of four cultivated South American potato species. *Journal of Food Composition and Analysis* 40: 78–85. <https://doi.org/10.1016/j.jfca.2014.12.006>
- Breslin, P. A. S. 2013. An evolutionary perspective on food and human taste. *Current Biology* 23 (9): 409–418. <https://doi.org/10.1016/j.cub.2013.04.010>
- Gurbuz, E. 2018. Theory of new product development and its applications. In Marketing. IntechOpen. <https://doi.org/10.5772/intechopen.74527>
- Mbowa, S. and Mwesigye, F. 2016. Investment opportunities and challenges in the Irish potato value chain in Uganda. Economic Policy Research Centre (EPRC), (Issue 14), 84pp.
- McGill, C. R., Kurilich, A. C. and Davignon, J. 2013. The role of potatoes and potato components in cardiometabolic health: A review. *Annals of Medicine* 45: 467–473. <https://doi.org/10.3109/07853890.2013.813633>
- Mugisha, J., Mwadime, R., Sebatta, C., Gensi, R. and Obaa, B. 2017. Factors enhancing household nutrition outcomes in potato value chain in southwestern Uganda. *Journal of Sustainable Development* 10 (3): 215-230. <https://doi.org/10.5539/jsd.v10n3p215>
- Nsubuga, D., Banadda, N. and Kiggundu, N. 2019. Innovations in value-addition of agricultural by-products in Uganda. *Journal of Environmental Protection* 10 (11): 1493–1506. <https://doi.org/10.4236/jep.2019.1011089>
- Okello, J. J., Sindi, K. and Low, J. 2014. Consumer perceptions and demand for biofortified sweet potato-based biscuit: the case of Akarabo Golden Power Biscuit in Rwanda. *African Journal of Food, Agriculture, Nutrition and Development* 14 (3): 8941–8955.