



Research in

AGRICULTURE, LIVESTOCK and FISHERIES

ISSN : P-2409-0603, E-2409-9325

An Open Access Peer-Reviewed International Journal

Article Code: 400/2023/RALF

Article Type: Research Article

Res. Agric. Livest. Fish.

Vol. 10, No. 1, April 2023: 61-71.

CONSUMERS' PREFERENCES FOR LOCAL AND IMPORTED CULINARY HERBS IN GAUTENG PROVINCE, SOUTH AFRICA

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ARTICLE INFO

Received

18 March, 2023

Revised

26 April, 2023

Accepted

29 April, 2023

Online

May, 2023

Key words:

Herbs
Consumers' preference
Multinomial logit model

ABSTRACT

Demand for culinary herbs in many developing countries is currently growing due to the increased perception of their nutritional and medicinal properties. There is a need to understand consumers' preferences for these products. This study, therefore, analyzed the determinants of consumers' preferences for locally produced and imported herbs in Gauteng province. The data were collected with a stratified sampling method from 385 respondents using a structured questionnaire. Multinomial logit regression was then employed for data analysis. The results indicated socio-economic factors and product attributes such as labeling, the attractiveness of packaging, and availability as determinants of preference for both local and imported herbs. Based on these findings, the study recommends that the promotion of herbs must be inclusive of both product attributes and socioeconomic factors.

To cite this article: Mphafi K., A. S. Oyekale and P. Ndou, 2023. Consumers' preferences for local and imported culinary herbs in Gauteng province, South Africa. Res. Agric. Livest. Fish. 10(1): 61-71.

DOI: <https://doi.org/10.3329/ralf.v10i1.66221>



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INTRODUCTION

Most Asian countries have realized significant increase in the consumption of food products made from culinary herbs (Vázquez-Fresno et al., 2019 and Dougkas et al., 2019). It had been emphasized that culinary herbs have served in the traditional food preparations and food industries, and have been associated with healthy living among the populace in some developed countries. This is complementing the realization that growth in the food industry has influenced the seasoning and herb market significantly to support the health needs of the people. It is important to note that seasoning with herbs is accountable for the aroma and taste of most foods, thus making it an integral part of the traditional and continental cuisines (Opara and Cohan, 2014). On their health benefits, many of the culinary herbs have anti-inflammatory and therapeutic properties, which have been pharmaceutical acknowledged. The demand for culinary herbs is experiencing substantive increase in some African countries due to increased realization of their nutritional values. In South Africa, culinary herbs consumption equates to 1-2% of total annual world recorded trade (Asowata-Ayodele et al., 2016). Furthermore, the culinary herb industries have over the past few years experienced a significant increase in demand. South Africa possesses some commendable potential to be among the largest producers of culinary herbs in the continent. A paradigm shift currently exists in the demand for culinary herbs, as consumers become more conscious about the correlation between their health and dietary habits. This is due to high prevalence of obesity and emergence of non-communicable diseases as one of the major public health concerns (Phaswana-Mafuya et al., 2013). This is more pathetic in some Sub-Saharan Africa (SSA), non-communicable diseases have been linked to increase in mortality and disability with the prevalence rates of hypertension, obesity and diabetes being 48%, 20% and 5.1%, respectively (Mudie et al., 2019).

Despite the increased pattern of demand for culinary herbs in South Africa, little is known on the level of consumers' preferences for locally produced and imported products. It had been confirmed that consumers' nutrient intake and food preferences are influenced by food production systems (Gligorijevic, 2015). This is a complex process because poor food preferences can result in suboptimal intake of essential nutrients (Tapsell et al., 2014; Marreiros and Ness, 2009). Moreover, food preferences are the major components of consumers' food demand decisions (Marreiros and Ness, 2009). The evolving food industry in Africa is therefore experiencing growth in consumers' preferences due to population growth, urbanization, and globalization. Consumers' changing food taste due to western influences is also facilitating development of food value chains. This had resulted in some food companies using herbs in their products to suit consumers' changing tastes. This will in turn enable more role players to enter the market and contribute to market growth. This is fundamental because demand for culinary herbs in South Africa is said to have recently doubled, and in order to cater for these increases, the country is relying mostly on importation of products from countries like India (Ronquest-Rosset al., 2015; Amanor and Chichava, 2016). Food preferences are intricately related to a complex network of cultural and individual characteristics. The ability to process information and evaluation of health, as well as households' and individual's characteristics are factors that can best explain consumers' demand preferences for culinary herbs. Consumers' food preferences are more complex than ever before, as differentiated consumers' demands have been reinforced by changes in the retailing sector which now provide some avoidable threats and slippery opportunities. The correlates of consumers' food preference are consumers' and market related factors (Kaya 2016; Caswell and Yaktine, 2013).

The importance of spices and herbs in the livelihood of people has been overly emphasized by several scholars (Jiang and 2019; Gajewska et al., 2020). Various studies also showed a linkage between demand for herbs and other food products. For instance, Fritts et al., (2018) found that there was an increase in vegetable consumption after they were seasoned with some spices and herbs. In some studies, the effect of socio-economic factors such as age on consumers' preferences has been vastly researched. According to Guiné *et al.*(2020), consumers' nutritional needs change throughout life and the relevance of age on consumption of functional foods cannot be over-emphasized. Various scholars have argued that lifestyle habits tend to become healthier as age increases though the relationship only lasts until late midlife (Ares and Gámbaro, 2007; Umberson and Karas Montez, 2010). A study on the association between demographic characteristics and food preferences found that age and gender had a positive and statistically significant effect on preferences (Vorage et al., 2020). Similarly, Asakura et al. (2017) reported an association between age and a high preference for nutritious food. The issues of preference for herbs have not been well studied in South Africa. Ultimately, knowledge of consumer preferences for herbs will enable key actors in the value chains to take the right decisions to facilitate demand. It is therefore within the above-mentioned context that this study seeks to identify the preference considered by consumers when they make decision to purchase culinary herbs in the Gauteng province of South Africa.

MATERIALS AND METHODS

Study area

This research was carried out in the Gauteng province of South Africa. The province is one of the nine provinces in the country and it is situated in the Highveld. Furthermore, the province is the smallest in terms of land area, accounting for only 1.5% of total South Africa's land areas (Oelofse et al., 2018). Nevertheless, it is highly urbanized and is marked by the highest population (± 13.2 Million). As indicated by Nhamo et al. (2021), the province was divided into three metropolitan municipalities namely Tshwane-Pretoria, Johannesburg and Ekurhuleni metropolitan municipality as well as two district municipalities Sedibeng and West Rand municipalities. The province is the fastest growing province. The major occupations of the people include farming, trading, artisans, agro-processing and marketing.

Source of data and sampling procedures

The study made use of primary data which were sourced from respondents with the aid of semi-structured questionnaire administered to households in Gauteng province. Information elicited from the respondents includes household socio-economic characteristics and consumer preference for herb in the province. Data were collected from randomly selected households in the study area. A multi-stage sampling procedure was adopted in the selection of respondents. Gauteng was purposively selected from the nine provinces of South Africa. The second stage was clustering of the population by municipalities then number of households per cluster (household listing). Systematic random sampling was then used to select respondents from all the municipalities (Ekurhuleni, Johannesburg, Tshwane, Sedibeng and West Rand). Based on the total household population figure of 13.2 Million provided by Statistics SA, a sample size of 385 respondents was randomly selected from all the municipalities using proportionate sampling. The last stage was random selection of respondents from different households within the different cities.

Estimation procedure/analytical procedure

To analyze the determinants of consumers' preferences in the consumption of culinary herbs, the study employed multinomial logit model to analyse the data collected. The multinomial logit model is more applicable and more relevant than the other regression models because the dependent variable is the preference that was shown for imported and locally produced herbs. Preference was the dependent variable, which has three categories. To identify the determinants of consumer preference, the research assumes that in a given period, rational consumers choose among the options of product origin: local, imported and anyone. Following Agboola et al. (2018), suppose the i^{th} respondent faced with j choices, assumes the utility choice as:

$$U_{ij} = Z_{ij}\beta + e_{ij} \quad \dots\dots 1$$

If the respondent makes choice j in particular, then the researcher assumes that U_{ij} is the maximum among the j utilities. Therefore, the statistical model is derived by the probability that choice j is made, which is:

$$\text{Prob } U_{ij} > U_{ik} \text{ for all other } k \neq j \quad \dots\dots 2$$

Researchers select this model not only because of the computational ease, but also due to a superior ability to predict occupational distribution (Czine et al., 2020). The multinomial logit model can allow estimating a set of coefficients β_j corresponding to each preference category as follows:

$$\text{Pr} (y = j/X) = \frac{e^{\beta_j x_i}}{\sum_{j=1}^J e^{\beta_k x_i}} \quad \dots\dots 3$$

Pr is the probability of an economic activity, i denotes the indexes of the individuals; j represents the three nominal unordered preference categories in the samples. The model can be written as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \dots \beta_n X_n + \varepsilon_i \quad \dots\dots 4$$

where,

Y= preference choices which is categorized as origin of herbs;

1 = Local, 2 = Imported 3 = Anyone

β_1, β_2 and β_n are the regression coefficients of the predictor variables which were age (years), gender (female = 1, 0 otherwise), marital status (married = 1, 0 otherwise), education (formally educated = 1, 0 otherwise), and monthly income. ε_i is the stochastic error term. The estimated coefficients measure the change in the logit for one unit change in predictor variable while the other explanatory variables are held constant. A positive estimated coefficient implies an increase in likelihood that a respondent will choose the alternative of culinary herbs' origin while a negative estimated coefficient indicates that there is less likelihood that a respondent will choose alternative herb's source.

RESULTS AND DISCUSSION

Table 1 presents the consumers' culinary herb demand preferences in relation to some demographic characteristics. The results showed that 46.90% of the respondents that preferred locally produced herbs was in the age group 37<47 years. Also, 68.97% of the respondents who preferred imported herbs were in a much younger age group of 27<37 years. Among the consumer who would buy any culinary herbs, 47.88% belonged to the age group of 27<37 years. Based on gender, the female respondents showed a higher preference for local and any culinary herbs with 76.54% and 84.85%, respectively. Moreover, 55.17% of the respondents who preferred imported culinary herbs were male. The results further revealed that 63.58% of the respondents who preferred locally produced herbs were married. Also, 67.24% of the respondents with preference for imported culinary herbs were single, while married respondents dominated preference for any herb with 72.12%.

The results further showed that preference for local herbs was highest in households with an average of three members and recorded 46% while on imported herbs it was high also on households with an average of three members in the family with a recording of 72%. Respondents who were not particular about origin of herbs recorded 60% and were from the second group of household size of an average of three members. Moreover, females showed more (77%) preference on local herbs than their male counterparts. On the other hand, male showed more preference on imported herbs with a recording of 55%. Results from education level revealed that respondent who held tertiary education preferred both local and imported herbs with recordings of 56% and 85%, respectively.

The results from religion and preference for herbs showed that Christians preferred both local and imported herbs and recorded 90% and 86% respectively. Respondents who were not particular about origin of herbs were also from the Christian group with a recording of 76%. From the ethnicity groups, preference for local herbs was high amongst the black group with a recording of 72% while from imported herbs, preference was high amongst the white group and recorded 69%. Majority (40%) of the respondents who were not particular about origin of herbs was recorded from the white ethnic group. Employment status also showed that local herbs were preferred mostly by the formally employed with a recording of 62% and 67 % for imported herbs. Moreover, formally employed respondents made majority (71%) in the category of those who were not particular about the origin of the herbs.

On monthly income, respondents who showed the most (30%) and 62% preference for local and imported herbs were those that earned an average of R 23000 on a monthly basis. Those who also showed preference but were not particular about origin of the herbs earned an average of R16000 on a monthly basis. Respondents who spent an average of R1500 showed preference for local herbs while those who spent R2500 showed much preference on imported herbs. Majority (46%) of the respondents who showed preference for herbs were not particular about origin of the herbs they purchased and consumed. The next session presents a summary of consumers' preferred forms for herbs.

Table 2 above summarises forms in which Gauteng respondents prefer their herbs. The table comprises of six forms of herbs namely: fresh, whole, dried, crushed, seeds and essential oil form. The results revealed that majority (95.58%) of the consumers preferred their herbs fresh with 79.22% dried while 74.55% preferred theirs in a crushed form. Only a few of the consumers preferred their herbs in the form of seeds and essential oil form marked by 14.55% and 26.75% respectively.

Table 1. Socio economic characteristic of the respondents in relation to preference for herbs

Variables	Herbs Origin					
	Local herbs		Imported herbs		Anyone	
	Freq	%	Freq	%	Freq	%
Age						
<25	10	6.17	2	3.45	20	12.12
25<35	51	31.48	40	68.97	79	47.88
35<45	76	46.91	4	6.9	36	21.82
45<55	13	8.02	8	13.79	23	13.94
>55	12	7.41	4	6.9	7	4.24
Marital status						
Single	36	22.22	39	67.24	46	27.88
Married	103	63.58	18	31.03	119	72.12
Other	23	14.2	1	1.72	0	0.00
Household size						
<2	59	36.42	7	12.07	18	10.91
2<4	75	46.3	42	72.41	100	60.61
4<6	27	16.67	7	12.07	27	16.36
>6	1	0.62	2	3.45	20	12.12
Gender						
Male	38	23.46	32	55.17	25	15.15
Female	124	76.54	26	44.83	140	84.85
Education level						
No formal	16	9.88	2	3.45	9	5.45
Primary	8	4.94	1	1.72	13	7.88
High school	47	29.01	6	10.34	33	20.00
Tertiary	91	56.17	49	84.48	110	66.67
Religion						
Christian	146	90.12	50	86.21	126	76.36
Non-Christian	16	9.88	8	13.79	39	23.64
Ethnicity						
Black	116	71.6	8	13.79	44	26.67
Coloured	22	13.58	1	1.72	1	0.61
White	8	4.94	40	68.97	66	40.00
Asian	16	9.88	9	15.52	54	32.73
Employment status						
Formal	101	62.35	39	67.24	117	70.91
Self employed	49	30,25	7	12,07	26	15,76
Unemployed	12	7,41	12	20,69	22	13,33
Monthly income						
<3500	12	7,41	0	0,00	0	0,00
3500>8500	24	14,81	5	8,62	19	11,52
8500>13500	4	2,47	4	6,9	26	15,76
13500>18500	40	24,69	6	10,34	56	33,94
18500>23500	34	20,99	7	12,07	38	23,03
>23500	48	29,63	36	62,07	26	15,76
Food expenditure						
<1000	13	8.02	4	6.90	17	10.30
1000<2000	114	70.37	4	6.90	41	24.85
2000<3000	31	19.14	45	77.59	76	46.06
3000<4000	2	1.23	3	5.17	10	6.06
>4000	2	1.23	2	3.45	21	12.73

Source: Field survey

Table 2. Respondents preferred forms of herbs

Form	Herbs	
	Frequency	Percentage
Fresh		
No	17	4.42
Yes	368	95.58
Whole		
No	280	72.73
Yes	105	27.27
Dried		
No	80	20.78
Yes	305	79.22
Crushed		
No	98	25.45
Yes	287	74.55
Seeds		
No	329	85.45
Yes	56	14.55
Essential oil		
No	282	73.25
Yes	103	26.75

Source: field survey

Table 3 above results show that eight explanatory variables from the first model and five from the second model were statistically significant with different levels and magnitude of each coefficient. The first parameter age, showed statistical significance and a negative association with local herbs with a coefficient of -0.054 and p value of 0.030. The results implied that as consumers' age, their preference for local herbs decreases and this could be due to lack of trust on locally produced herbs. The results are however, contrary to those reported by Denver et al. (2014) who revealed that preference for local food increases with age. Results on marginal effect for age also showed a negative association with statistical significance of $p < 0.052$.

Among local choices, marital status reported a statistical significance ($p < 0.000$) and a positive impact on preference for locally sourced herbs. The results implied that, compare to those with no preference, those who are married showed a high probability of preferring local herbs. This is due to the effect of spousal support in decision-making. Similarly, Sedem et al. (2017) also reported that being married increased preference for local rice in Ghana. Results from marginal effect also showed a positive association with preference for local herbs and statistical significance with coefficient of 0.4360 and $p < 0.000$. On the other hand, household size showed a positive effect on preference for local herbs and statistical significance with $p < 0.000$. This means that compared to those with no preference, household size showed a high probability of preference for local herbs. The results are in contrary with those reported by Codjoe et al. (2016) who reported that household size decreases preference for local food. This could be due to the fact that as the number of household member's increases, demand for local herbs increases and thus preference and consumption of the commodity. Marginal effect results on household size showed a negative association with preference for local herbs and statistical significance with coefficient and p value of -1.05 and 0.00 respectively.

Table 3. Estimation of multinomial logit model for consumer's preference for sources of herbs: Spice origin (three categories- local, imported, not particular about origin)

Variable	Coefficient	Std. Err	P Value	dy/dx	P Value
(Local herbs vs not particular)					
Socio-economic factors					
Age	-0.054	0.024	0.030	-0.008	0.052
Marital status	2.355	0.386	0.000	0.436	0.000
Household size	0.710	0.102	0.000	-0.105	0.000
Gender	-3.027	0.542	0.000	-0.414	0.000
Education level	-0.140	0.159	0.381	-0.283	0.302
Product attributes					
Labelling	0.312	0.189	0.099	0.052	0.096
Attractiveness	-1.360	0.278	0.000	-0.187	0.000
Health attribute	0.000	0.264	0.997	0.012	0.795
Packaging	0.993	0.225	0.000	0.144	0.000
Taste	0.121	0.233	0.602	0.025	0.526
Availability in the market	-0.284	0.198	0.151	-0.016	0.541
Cons	5.253	1.474	0.000		
(Imported herbs vs not particular)					
Socio-economic factors					
Age	-0.504	0.042	0.231	0.000	0.703
Marital status	-0.054	0.688	0.937	-0.090	0.005
Household size	-0.684	0.146	0.000	-0.012	0.067
Gender	-3.854	0.752	0.000	-0.104	0.002
Education level	0.686	0.326	0.833	0.009	0.597
Product attributes					
Labelling	0.144	0.300	0.630	-0.003	0.819
Attractiveness	-1.712	0.531	0.001	-0.045	0.092
Health attribute	-0.320	0.551	0.561	-0.018	0.539
Packaging	1.040	0.371	0.005	0.021	0.241
Taste	-0.076	0.409	0.852	-0.008	0.680
Availability in the market	-0.820	0.496	0.099	-0.035	0.183
Cons	6.422	2.506	0.010		
Number of observations	385				
LR Chi2 (22)	210.68				
Prob > chi2	0.000				
Pseudo R2	0.294				
Log Likelihood	-252.60169				

***p<0.001(1%); **p<0.05(5%); *p<0.1(10%)

Gender was found to have a negative association with preference for local herbs with statistical significance of $p < 0.000$. The results implied that compared to those with no preference, gender showed a low probability of preference for local herbs. The results are in agreement with those reported by Ogunleke (2020) who also postulated that gender had a negative effect on preference for local food. Marginal effect coefficient for gender also showed a negative relationship with preference for local herbs with a recording of -0.44 and p value of 0.000.

Concerning households' preference for attractiveness, the parameter reported a negative association (-1.360) and statistical significance ($p < 0.000$) with local herbs. The results implied that compared to those who showed no preference, those who were for attractiveness showed low probability for preferring local herbs. This could be because consumers turn to doubt the quality of local food and thus demand less of it. On the contrary, Nwachukwu and Achike (2020) reported that attractiveness showed a positive relationship with preference for local rice versus imported rice in Enugu State, Nigeria. Results of marginal effect showed a negative association with preference for local herbs and statistical significance of $p < 0.000$.

Furthermore, results on packaging recorded a positive effect of 0.933 and statistical significance ($p < 0.000$) to preference for local herbs. The results implied that compared to those who showed no preference, those who were for packaging had a high probability of preferring local herbs. This could be because packaging prevents waste and is associated with good quality and improved shelf life. The results are in agreement with those reported by Picha et al. (2018) who reported that consumers' preference for local food was highly influenced by proper food packaging. The results agree to those reported by Wyrwa and Barska (2017) who stated that consumers prefer food products that are properly packaged and that possess good taste. Similarly, marginal effect results for packaging showed a positive association and statistical significance of 0.144 and 0.000 respectively.

Results on labeling showed statistical significance with a p value of 0.09 and a positive association with local herbs. The results implied that compared to those who showed no preference, those who were for proper labelling had high probability of preferring local herbs. According to Profeta and Hamn (2019) consumers in Germany showed preference for food local food that was properly labelled. Also, Parcel and Gedikoglu (2012) reported that consumers preferred domestic food versus imported food and mostly labelling played a significant role. Surprisingly, availability in the market showed a negative impact and statistical significance with preference for local herbs over the base model. This implies that compared to those who showed no preference, those who were for availability in the market showed low probability for preferring local herbs. The results differ with those reported by Udomkun *et al.* (2018) and Vainikka (2015) who indicated that product availability plays an important role in consumer loyalty on products in the market. From the second model on preference for herbs that were imported, household size showed a negative effect of -0.684 and statistical significance of $p < 0.000$ with preference for imported herbs. The results implied that compared with those who showed no preference, an increase household size had low probability of preferring imported herbs. The results are in agreement with those reported by Jeli (2017) who highlighted that consumers' preference for local food was highly influenced by the number of members in the household. This could be due to an increase in demand for herbs, which turns to result in constraints of budget for food in the household. Marginal effect results also showed a negative association (-0.012) with preference for imported herbs and statistical significance of $p < 0.062$.

In addition, gender showed a negative association with preference for imported herbs and a statistical significance with $p < 0.000$. The results implied that as the consumers get older, they turn to prefer less of imported herbs and this could be associated with price effects that come with importing food products. The results are however in contrary with those reported by Piao et al. (2020) who reported a positive association between age and imported rice. Attractiveness and availability also reported a negative association with imported herbs in the province. This implies that compared with those who showed no preference, those who were for attractiveness and availability of herbs had low probability of preferring imported herbs. The results are however in contrary with those reported by Yang and Panjaitan (2021) and Sinaga (2017) who indicated that attractiveness and availability play an important role in influencing consumer preference for imported citrus. Results from marginal effect showed an association with preference for imported herbs with a coefficient of -0.104 and $p < 0.002$.

Lastly, packaging of food showed a positive association with preference for imported food. The parameter reported a coefficient of 1.040 and p value of 0.009. The results implied that, compared to those who showed no preference, those who preferred imported herbs payed attention to packaging of the herbs. Proper packaging plays an important role in protecting food from outside damage and to provide consumer with vital information regarding the food product. The results are in agreement with those reported by Bukhari et al. (2020) who also emphasize the importance of packaging in influencing preference for imported western food products. Results from the two models against the base model highlight

that age, marital status, household size, gender; labelling, attractiveness, packaging and availability of herbs in the market had an impact on influencing probability of preference for herbs. From the first model on preference for local herbs, marital status, household size, labelling and packaging showed a positive association with preference while the other parameters showed a negative association.

CONCLUSION

The aim of the study was to identify determinants of consumers' preferences in the consumption of culinary herb in relation to their origin in South Africa-Gauteng Province. Results from the multivariate analysis revealed that preference for and herbs were influenced by socio-economic factors such as age, gender and marital status. Other factors associated with preference were, age, marital status, gender, product labelling, packaging and availability in the market. Given the general determinants of preference for herb, the study recommends that promotion of herb must be inclusive of both product attributes and socio economic factors. There is also a need to undertake further research on a comparative analysis between rural and urban area consumption and preference for different herb.

ACKNOWLEDGEMENTS

Financial support by the Agricultural Research Council (ARC), Pretoria, South Africa, is gratefully acknowledged.

CONFLICT OF INTEREST

The Authors declare no conflict of interest.

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