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CONSUMER KNOWLEDGE, PERCEPTIONS, PRACTICES AND THE BARRIERS RELATING TO ORGANIC FOODS - JOHANNESBURG, GAUTENG PROVINCE, SOUTH AFRICA

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ABSTRACT

Globally, organic food consumption has increased over the past two decades and continues to do so. Although international research on consumer practices, perceptions, knowledge and the barriers relating to organic food has been extensive, the literature in South Africa (SA) is limited. This study aimed to address the apparent knowledge gap. A convergent mixed methods study was conducted. For quantitative data, an interviewer-administered questionnaire was completed with 337 adult consumers at 16 randomly sampled grocery stores in Gauteng, Johannesburg, SA. Study participants were stratified based on their frequency of organic food consumption as regular organic food consumers (ROFC), occasional organic food consumers (OOFC) and non-organic food consumers (NOFC). Qualitative data (N=18) were collected by means of focus group discussions. A total of 44.8% of questionnaire participants were ROFC, 43.0% were NOFC and 12.2% were OOFC. ROFC were significantly older (p=0.040) than NOFC. The main motive for consuming organic food among questionnaire participants was health and nutritional reasons (91.67%). Similarly, focus group discussion participants were primarily motivated to consume organic food for health reasons. Participants perceived organic food to be more environmentally friendly (98.8%) and healthier (94.1%) than conventional food (CF). Most participants disagreed that CF is safer (94.1%), has a superior quality (78.9%) and that it is tastier (61.1%) than organic food. Negative perceptions of organic food predominantly related to the price and availability thereof. The total mean knowledge score was 57.6%, with ROFC having a significantly higher score than NOFC (p=0.048). Focus group discussion data indicated that ROFC had a better understanding of organic food. The main barriers to consuming organic food were the high cost (65.9%) and the lack of availability (57.3%) thereof. Similarly, price, lack of convenience and lack of availability were barriers for the focus group discussion participants.

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INTRODUCTION

The demand for organic food has increased substantially over the past two decades and continues to do so (Massey, O'Cass & Otahal 2018). Despite this apparent rapid growth in the organic food sector globally, market-related statistics for South Africa (SA) are limited (Kelly & Metelerkamp 2015; Willer & Lernoud 2016). However, it would appear as if there is a growing interest in organic, free-range, and locally produced foods among South African consumers (Vermeulen & Biénabe, 2007).

When considering the human health implications of organic food, research remains largely inconclusive. At present, there is an insufficient evidence base to reason that organic food provides superior health benefits when compared to conventional food (CF) (Barański *et al.* 2014; Dangour *et al.* 2010; Smith-Spangler *et al.* 2012). However, organic food consumers appear to have healthier dietary patterns overall that have been associated with a decreased risk of chronic disease (European Parliamentary Research Service 2016). Moreover, dietary patterns of organic food consumers appear to be more environmentally sustainable when compared to current consumption patterns of CF (Reganold & Wachter 2016).

Organic food consumers have comparatively low exposure to pesticides. Whether low-grade long-term pesticide exposure, at levels normally found in CF, is harmful to humans and/or is clinically significant, is yet to be established (Holzman 2012; Smith-Spangler *et al.* 2012). However, there is convincing evidence supporting the ideal of low dietary exposure to pesticides, especially in vulnerable groups like pregnant women and children (European Parliamentary Research Service 2016).

When considering nutritional differences between organic food and CF, there seems to be a consensus that there are compositional differences, mostly in favour of organic food (European Parliamentary Research Service 2016; Średnicka-Tober *et al.* 2016a; Średnicka-Tober *et al.* 2016b). However, whether or not these compositional differences are of nutritional importance and/or of clinical relevance, is still open to debate (Campbell 2012; European Parliamentary Research Service 2016).

A systematic review (Smith-Spangler *et al.* 2012) reported no difference between organic food and CF in contamination risk of produce with pathogenic bacteria. Conventional and organic animal products are both commonly contaminated with the *Salmonella* as well as the *Campylobacter* species. In conventional animal husbandry, antibiotics are used as a preventative treatment of disease in animals. The practice of preventatively using antibiotics has been linked to an increased risk of antibiotic resistance in bacteria (European Parliamentary Research Service 2016). However, it remains unclear as to what extent antibiotic use in farm animals contributes to antibiotic-resistant pathogens in humans (Mathews 2001).

Organic food consumption is associated with

certain consumer profiles and characteristics (Hughner *et al.* 2007). It is associated with a healthy lifestyle (lower body mass index, increased physical activity), healthy dietary practices (increased consumption of fruits, vegetables, whole grains and legumes and a decreased intake of red and processed meat), social class (higher level of education and income), gender (females consume more organic food) and the presence of children in the household (Eisinger-Watzl *et al.* 2015; Kesse-Guyot *et al.* 2013; Petersen *et al.* 2013). South African organic food consumers typically fall into a higher income bracket, are older, English speaking and have a higher level of education (Du Toit & Crafford 2003; Vermeulen & Biénabe 2007).

A study focusing on consumers residing in Gauteng, SA, who fall into the middle- and upper socio-economic groups, found that 36% of respondents purchased organic food, even if at irregular intervals (Vermeulen & Biénabe 2010). Both the national and international literature have reported that vegetables and fruit are the most common organically-produced food groups purchased (Du Toit & Crafford 2003; Van Loo *et al.* 2013; Vermeulen & Biénabe 2010).

The term “organic” is largely misunderstood by producers, consumers and retailers (Hughner *et al.* 2007; Massey *et al.* 2018). However, a South African study (Vermeulen & Biénabe 2010) found that 85% of respondents that purchased organic food had a good knowledge of organic food. Organic food knowledge correlated well with a higher level of education. Respondents associated the term “organic” with concepts such as: “no chemicals”; “no pesticides”; “no poison used”; “natural”; “healthy/ nutritious” (Vermeulen & Biénabe 2010).

Consumers generally have positive perceptions of organic food. These relate to health, quality, safety, freshness, environmental impact, animal welfare and nutritional value (Hughner *et al.* 2007). Common negative perceptions on organic food mainly pertain to the appearance, taste and availability thereof (Massey *et al.* 2018). Interestingly, some of the perceptions that consumers have relating to organic food are not founded on scientific literature (Barański *et al.* 2014; Hemmerling, Hamm & Spiller 2015; Zhao *et al.* 2007). As with the international literature, South African consumers perceive organic food to be healthier, more nutritious, tastier and safer when compared to CF (Du Toit & Crafford 2003; Vermeulen & Biénabe 2010). South African consumers’ negative perceptions predominantly relate to availability and price (Du Toit & Crafford 2003; Vermeulen & Biénabe 2010).

A recent meta-analytic study emphasised the multifaceted nature of the motives that drive organic food consumption (Massey *et al.* 2018). Results indicated that consumption of organic food is to a great extent driven by product differentiation based on consumers’ positive perceptions of organic food. This study found the primary motivation for organic food consumption to be the perceived health benefits thereof. This also holds true for South African consumers (Vermeulen & Biénabe 2007). The international literature has reported the predominant motives for consuming organic food to be health, quality, safety, freshness, environmental impact, animal welfare, nutritional value, support of local economy and taste (Hughner *et al.* 2007; Massey *et al.* 2018). Other less popular motives include naturalness, nostalgia and curiosity (Hughner *et al.* 2007; Verhoog *et al.* 2003). A South African study presented similar results to those found in the international literature, namely that health, nutritional content and the superior taste of organic food motivate the consumption thereof (Vermeulen & Biénabe 2010).

Barriers to the consumption of organic food include high prices, lack of availability, lack of trust, lack of marketing, lack of understanding, satisfaction with current food sources and cosmetic defects (Aschemann-Witzel & Zielke 2017; Massey *et al.* 2018). Lack of trust as a barrier is of particular relevance as there is currently no specific legislation pertaining to organic products in SA (Tung 2016). Among

South African consumers, the primary barrier to purchasing organic food is a lack of availability, followed by price (Nielsen 2005).

The current study was motivated by the paucity of national literature on consumers' organic food practices, perceptions, knowledge and the barriers to consumption. This study aimed to address the apparent knowledge gap. The use of a mixed methods approach, using a survey and focus groups, adds value through the collection of in-depth, comprehensive data on the topic. Primary objectives of the questionnaire were to determine practices, perceptions, knowledge and the barriers relating to organic food. Secondary objectives were to determine whether there is a difference in knowledge as well as perceptions according to the frequency of organic food consumption and other consumer characteristics. Primary objectives of the focus group discussions were to explore the understanding of the concept of organic food as well as consumers' practices, perceptions of, and the barriers to, organic food.

METHODS

A convergent mixed methods research study was conducted (Creswell 2014). The purpose of utilising the mixed methods approach was to obtain different but complementary data on the same topic to understand the research problem best. A convergent design was used to allow the comparison and contrasting of quantitative statistical results with qualitative findings for the purpose of corroboration and validation (Creswell 2014). For quantitative data, a cross-sectional, descriptive study design with an analytical component was utilised. Data were collected by means of an interviewer-administered questionnaire. For qualitative data, a phenomenological study design was utilised. Qualitative data were collected by means of focus group discussions. Traditionally, most phenomenological interviews are conducted by means of in-depth interviews. However, literature can be found arguing that focus groups are congruent with phenomenological research. Focus group discussions in phenomenology can be beneficial due to the fact that they stimulate discussion and open up new perspectives (Bradbury-Jones, Sambrook & Irvine 2009).

Qualitative and quantitative data collection occurred in parallel but separately. The two forms of data were analysed separately and independently from each other. Finally, the two sets of results were compared and merged into an overall interpretation (Creswell 2014).

Ethical considerations

This study was conducted according to the guidelines laid down in the Declaration of Helsinki, and all procedures involving human subjects were approved by the Health Research Ethics Committee of Stellenbosch University, Cape Town, SA (S18/06/133). Written informed consent was obtained from all participants. A copy of the consent form was provided to all participants. Consent documents were made available in English and isiZulu as these are the two most commonly spoken languages in Johannesburg (Statistics South Africa 2011).

Sampling

Study participants consisted of adult consumers (≥ 18 years) that had a good understanding of the term *organic food*, that "sometimes" purchased food for their household and did their grocery shopping at sampled grocery stores in Johannesburg, Gauteng, SA. A multi-stage sampling technique was employed. The city of Johannesburg is divided into 40 areas (Statistics South Africa 2011). Sixteen areas were randomly sampled. Grocery stores were stratified into the four main food retail groups in SA. Sampled areas were randomly allocated to one of the four main retail group strata.

A comprehensive list of all grocery stores, from the allocated retail-group strata, was obtained for the sampled areas by means of the "Store Locator" function on the official websites of the respective food retail groups. One store, from the allocated food retail group strata, was

selected for inclusion by means of simple random sampling. A total of 16 stores were included.

Sampling of questionnaire participants

Questionnaire participants were sampled by means of convenience sampling. Individuals doing their food shopping on the day of data collection were approached randomly and screened for possible inclusion in the study. Once the interviewer had finished conducting the questionnaire with a participant, the next individual exiting the store was approached. Study participants were stratified based on their frequency of organic food consumption as regular organic food consumers (ROFC), occasional organic food consumers (OOFC) and non-organic food consumers (NOFC). Participants consuming organic food "daily" or "two to six times per week" were classified as ROFC, participants consuming organic food "once a week" were classified as OOFC and participants consuming organic food "once a month" or "never" were classified as NOFC.

A power analysis was used to calculate the sample size for a one-way ANOVA design. The power was set at 90% with an effect size of 0.25 and a Type 1 error rate of 0.05, giving a minimum sample size of n=103 for each of the three groups and a total minimum sample size of 309 participants. Based on available resources, a target of N=336 was set (112 participants per consumer group). Despite measures taken to encourage approximately evenly sized consumer groups, the target of 112 participants was not achieved for the OOFC group. An effect size of between 0.25 and 0.4 with 90% power was detected with the different sample sizes of n=41, n=145 and n= 151 per group.

Sampling of focus group participants

Focus group participants were sampled by means of purposive sampling. Questionnaire participants were contacted for participation in the focus group discussions. Participants were stratified into three groups (NOFC, OOFC or ROFC) based on their frequency of organic food consumption, as determined during the questionnaire. Due to a low response rate, snowball sampling was used in order to meet the required sample size. Participants were encouraged to bring along friends/family who met the inclusion criteria and who had a similar organic food consumption to themselves.

Methods of data collection

Methods of data collection: questionnaire

Two researchers, trained and standardised, collected data over a ten-week period by means of an interviewer-administered questionnaire. Each store was visited at least once. Data were collected during different days (weekdays and weekends) and times of the day. A questionnaire, taking approximately 15 min, was completed outside the entrance of the store. Participants received a small gift to thank them for their time.

Methods of data collection: focus group discussions

Based on available resources, and due to low response rate, three focus group discussions (one per consumer group) was conducted in a boardroom at a central location in Johannesburg. Each focus group discussion was approximately 90min in duration. The interviewer served as moderator and the assistant as an observer.

Data collection tools

An interviewer-administered questionnaire was used to determine consumer practices, perceptions, knowledge and the barriers relating to organic food. The questionnaire was constructed based on the objectives of the study as well as the current literature (Hughner *et al.* 2007; Massey *et al.* 2018; Van Loo *et al.* 2013; Vermeulen & Biénabe 2010). The questionnaire consisted of five sections: demographic characteristics, practices, perceptions, knowledge and barriers. Sub-sections under

TABLE 1: QUESTIONS ASKED DURING FOCUS GROUP DISCUSSIONS

Question asked of focus group participants	Consumer group(s) addressed
1.Tell me more about how you choose what food to buy for your household? Are there particular considerations that influence your decisions?	NOFC, OOFC, ROFC
2.How do you decide on where to buy your food?	NOFC, OOFC, ROFC
3.Tell me more about the factors that affect how often you purchase food?	NOFC, OOFC, ROFC
4.What does the term *organic food* mean to you?	NOFC, OOFC, ROFC
5.What does the term *conventional food* mean to you?	NOFC, OOFC, ROFC
6.How do you feel about organic food?	NOFC, OOFC, ROFC
7.How do you feel about conventional food?	NOFC, OOFC, ROFC
8.Can you explain to me why your household prefers to consume conventional foods?	NOFC
8. Can you explain to me why your household prefers to consume organic foods occasionally?	OOFC
8. Can you explain to me why your household prefers to consume organic foods regularly?	ROFC
9.What does organic certification mean to you?	NOFC, OOFC, ROFC
10.When you see an *organic food* label, what do you think? How do you feel about products labelled as organic?	NOFC, OOFC, ROFC
11.When considering animal products, is “free-range” synonymous with “organic” to you?	NOFC, OOFC, ROFC
12.Do you think there are barriers preventing from buying organic food?	NOFC, OOFC, ROFC
13.Explain to me how you feel about organic food prices when compared to conventional food prices?	NOFC, OOFC, ROFC

Abbreviations: Non-organic food consumers (NOFC), Occasional organic food consumers (OOFC), regular organic food consumers (ROFC).

practices included general purchasing practices, organic food purchasing frequency, willingness to pay a price premium for organic food, organic food consumption frequency, motives for consuming organic food, sources of organic food and organically-produced food groups consumed. Questions relating to organic food consumption (motives for consuming organic food, sources of organic food and organically produced food groups consumed) were only applicable to participants consuming organic food (ROFC and OOFC) and were not asked for NOFC. For these questions, participants were allowed to select all relevant answers (i.e., more than one option). The section on perceptions contained twelve 4-point Likert scale questions consisting of the following options; strongly agree/agree/disagree/strongly disagree. The knowledge section consisted of one open-ended question and seven closed-ended true/false questions. For the question relating to barriers, participants were allowed to select all applicable answers.

Content validity was ensured by sending the questionnaire to a panel of three experts in the field of consumer studies, and their recommendations were incorporated. In order to establish face validity, N=23 consumers were given the opportunity to give feedback regarding the validity of the questionnaire during a pilot study that was conducted at a conveniently-located grocery store. Alterations were made accordingly. For test re-test reliability of the questionnaire (n=20), the agreement and consistency of the continuous variables were investigated with intraclass correlations for agreement and consistency, while contingency tables and kappa coefficients were used for nominal responses. Questionnaire reliability was further enhanced by the use of a standard operating procedure document and the standardisation of all processes.

Three focus group discussion guides, one per consumer group, were developed based on the objectives of the study, as well as current literature (Chang & Zepeda 2004). Questions asked during focus group discussions are provided in Table 1.

Data analysis

Data analyses: quantitative data

STATISTICA Version 15 was used for data analyses. Relationships between continuous response variables were analysed with regression and Pearson or Spearman correlations. Where a continuous response variable was related to several continuous input variables, multiple regression analysis was used with multiple correlations. The relationship between continuous response variables and nominal input variables was analysed using appropriate analysis of variance (ANOVA) or non-parametric ANOVA methods. For completely randomised designs, Mann-Whitney tests or Kruskal-Wallis tests were used, and for repeated measures, Wilcoxon- or Friedman tests. The relations between nominal variables were investigated using contingency tables and appropriate chi-square tests. The knowledge score was computed as the mean score of questionnaire items relating to organic food knowledge, yielding percentages as responses. Since the item scores are not on a Likert scale or continuous scale, no exploratory factor analysis or Cronbach reliability analysis was done. A p-value of less than 0.05 indicates significance for all tests. Ninety-five per cent confidence intervals were used to illustrate the estimation of unknown parameters.

Data analyses: qualitative data

Focus group discussions were audio-recorded. Additionally, the observer took handwritten observations. Voice recordings were transcribed verbatim. The data were systematically examined while content analysis was conducted manually (Braun & Clarke 2006). Notes were made on the main themes that could be established around the key concepts explored in the focus group discussions. Themes were summarised into organised descriptions in a way that addressed the objectives of the study and facilitated the discussion of the data. Deductive and inductive reasoning processes were utilised to derive meaning from the participants' responses (Draper & Swift 2011).

RESULTS

Demographic characteristics and frequency of organic food consumption

Table 2 summarises the demographic characteristics of questionnaire participants. A total of 44.8% (n=151) of participants were ROFC, 43.0% (n=145) of participants were NOFC and 12.2% (n=41) of participants were OOFC. This study found very few significant demographic differences across consumer groups; ROFC were significantly older (p=0.040) than NOFC and significantly (p=0.011) more ROFC (40.4%; n=61) were following a specific eating plan than OOFC (31.7%; n=13) or NOFC (24.1%; n=35).

The number of participants that took part in the focus group discussions totalled 18. The mean age of focus group discussion participants was 35.0 years, and the majority (83.3%; n=15) were female. A total of 38.9% (n=7) of participants were OOFC, 33.3% (n=6) were ROFC and 27.8% (n=5) were NOFC.

Practices: purchasing practices

Most participants (43.9%; n=148) shopped for food two to six times per week. The majority of participants shopped for food at the same store "most of the time" (59.1%; n=199). Most (96.7%; n=326) participants, most often, shopped for their food from one of the four main retail groups in SA. A total of 95 (28.2%) participants purchased organic food "once a month", 79 (23.4%) purchased organic food "once a week", 79 (23.4%) "never" purchased organic food, 72 (21.4%) purchased organic food "two to six times a week" and 12 (3.6%) purchased organic food "daily". More than half of the participants (58.2%; n=196) reported that they would still purchase an organic product even if the price were higher than a non-organic alternative. Significantly (p=0.001) more ROFC (82.1%; n=124) were willing to pay a price premium for

TABLE 2: DEMOGRAPHIC CHARACTERISTICS OF SURVEY PARTICIPANTS (N=337)

	Total		NOFC		OOFC		ROFC	
	n	%	n	%	n	%	n	%
Participants	337	100	145	43.03	41	12.17	151	44.81
Gender								
Male	122	36.20	56	45.90	13	10.66	53	43.44
Female	215	63.80	89	41.40	28	13.02	98	45.58
Age (years)*								
Mean	43.10		41.12		42.66		45.01	
Total household income before deduction								
No income	4	1.56	3	75.00	1	25.00	0	0.00
R1-R1600	1	0.39	1	100.00	0	0.00	0	0.00
R1 601-R3 200	5	1.95	3	60.00	2	40.00	0	0.00
R3 201-R6 400	4	1.56	2	50.00	0	50.00	2	0.00
R6 401-R12 800	19	7.39	12	63.16	2	10.53	5	26.32
R12 801-R25 600	34	13.23	18	52.94	5	14.71	11	32.35
R25 601-R51 200	61	23.74	31	50.82	7	11.48	23	37.70
R51 201-R102 400	78	30.35	32	41.03	8	10.26	38	48.72
≥ R102 401	51	19.84	13	25.49	8	15.69	30	58.82
Highest level of education								
Some secondary school	15	4.45	10	66.67	1	6.67	4	26.67
Completed grade 12	81	24.04	41	50.62	9	11.11	31	38.27
Higher degree	225	66.77	88	39.11	29	12.89	108	48.00
Other	16	4.75	6	37.50	2	12.50	8	50.00
Employment status								
Full-time	149	44.21	75	50.34	16	10.74	58	38.93
Part-time	21	6.23	12	57.14	2	9.52	7	33.33
Temporarily employed	5	1.48	2	40.00	0	0.00	3	60.00
Self employed	67	19.88	23	34.33	8	11.94	36	53.73
Retired	40	11.87	12	30.00	7	17.50	21	52.50
Student	14	4.15	3	21.43	3	21.43	8	57.14
Unemployed (seeking work)	24	7.12	12	50.00	2	8.33	10	41.67
Unemployed (not seeking work)	17	5.04	6	35.29	3	17.65	8	47.06
Smoking tobacco products								
Yes	61	81.10	30	49.18	6	9.84	25	40.98
No	225	66.77	95	42.22	30	13.33	100	44.44
I use to	51	15.13	20	39.22	5	9.80	26	50.98
Exercising								
Yes	250	74.18	99	39.60	32	12.80	119	47.60
No	87	25.82	46	52.87	9	10.34	32	36.78
Consuming alcohol								
Yes	175	51.93	79	45.14	22	12.57	74	42.29
No	123	36.50	53	43.09	16	13.01	54	43.90
I use to	39	11.57	13	33.33	3	7.69	23	58.97
Specific diet*								
Yes	109	32.3	35	32.11	13	11.93	61	55.96
No	228	67.6	110	48.25	28	12.28	90	39.47

Abbreviations: Non-organic food consumers (NOFC), Occasional organic food consumers (OOFC), regular organic food consumers (ROFC).

*p <0.05 statistically significant

Note: The totals are column percentages and the remaining row percentages.

TABLE 3: SOURCES OF ORGANIC FOOD (N=192)

Organic food source	Participants selecting organic food source % (n)
General supermarket	83.9% (161)
Farm	37.0% (71)
My own garden	25.5% (49)
Organic/health store	16.7% (32)
Other	6.8% (13)
Online	2.6% (5)

TABLE 4: FOCUS GROUP PARTICIPANT PERCEPTIONS OF ORGANIC FOOD (N=18)

Perceptions held by focus group participants	
Positive perceptions towards organic food	Healthier Tastier More environmentally friendly Friendlier towards animals Safer
Negative perceptions towards organic food	Expensive Less available Lack of trust

TABLE 5: PERCENTAGE OF SURVEY PARTICIPANTS WITH A CORRECT RESPONSE TO QUESTIONS ON ORGANIC FOOD (N =337)

Question	n	%
Organic foods are allowed to contain genetically modified organisms.	228	67.7
There is currently no specific law on organic food products in South Africa.	135	40.1
"Natural" is the same as "organic".	183	54.3
In organic farming, farmers are allowed to use synthetic/man-made pesticides.	280	83.1
In organic animal farming, farmers are allowed to use antibiotics to prevent animals from getting sick.	176	52.2
Organic foods are the same as traditional or indigenous foods.	185	54.9
Organic foods are the same as herbal foods.	171	50.7
TOTAL* mean organic food knowledge score	337	57.57± 24.29

**The knowledge score was computed as the mean score of questionnaire items relating to organic food knowledge, yielding percentages as responses.*

organic food products than OOFC (58.5%; n=24) or NOFC (33.1%; n=48).

Practices: organic food consumption and consumer motives

Reported data for this sub-section are only applicable to participants consuming organic food (n=192), NOFC were not asked to complete this section of the questionnaire. Participants were allowed to select more than one answer. Vegetables, followed by fruits, were the most common food groups consumed organically, with 93.8% (n=180) of participants consuming organic vegetables and 84.9% (n=163) of participants consuming organic fruit. Chocolate (12.0%; n=23) and coffee (18.2%; n=35) were the least common organic food groups consumed (Figure 1).

The three most common sources of organic food included; general supermarkets (83.9%; n=161), farm or farmers' markets (37.0%; n=71) and participant's own garden (25.5%; n=49). Sources of organic food are presented in Table 3.

The most common motive (91.7%; n=176) for consuming organic food was health and nutritional reasons (Figure 2). No significant difference (p=0.891) was found between ROFC and OOFC in their motives provided for consuming organic food. Motives for consuming organic food that arose during the focus group

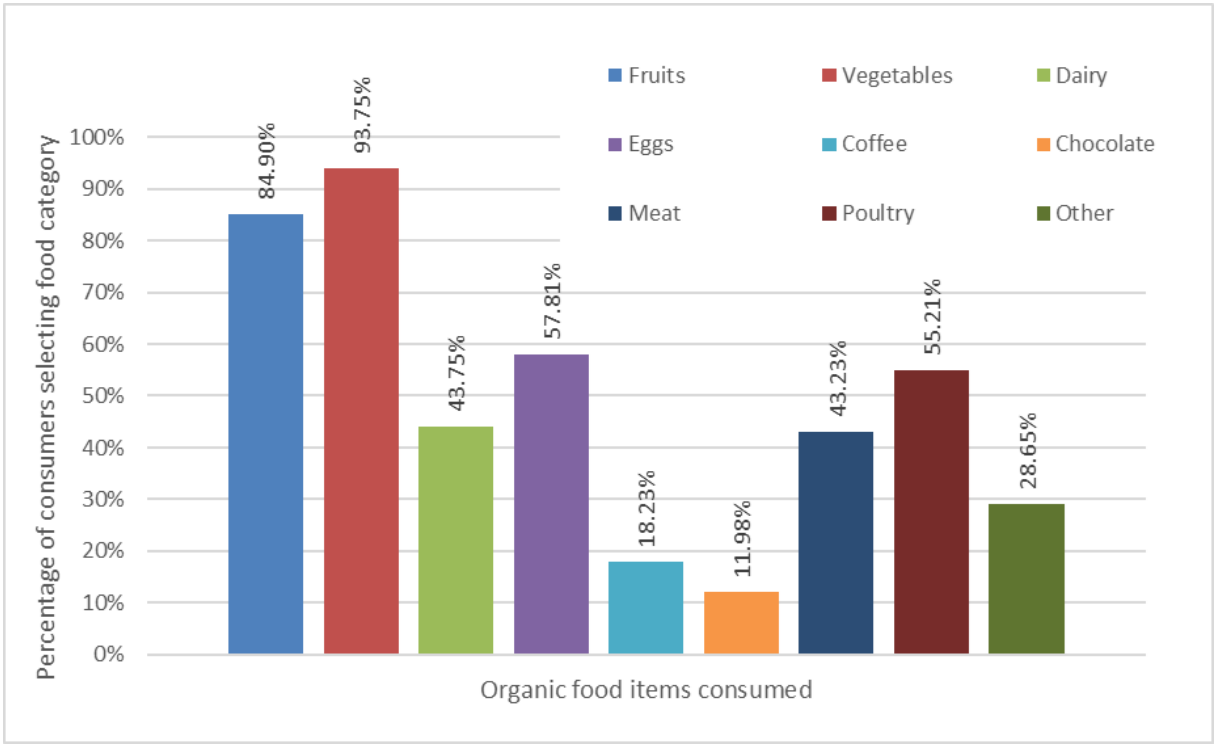

FIGURE 1: PERCENTAGE OF ORGANIC FOOD CONSUMERS CONSUMING FOOD CATEGORIES ORGANICALLY (N=192)

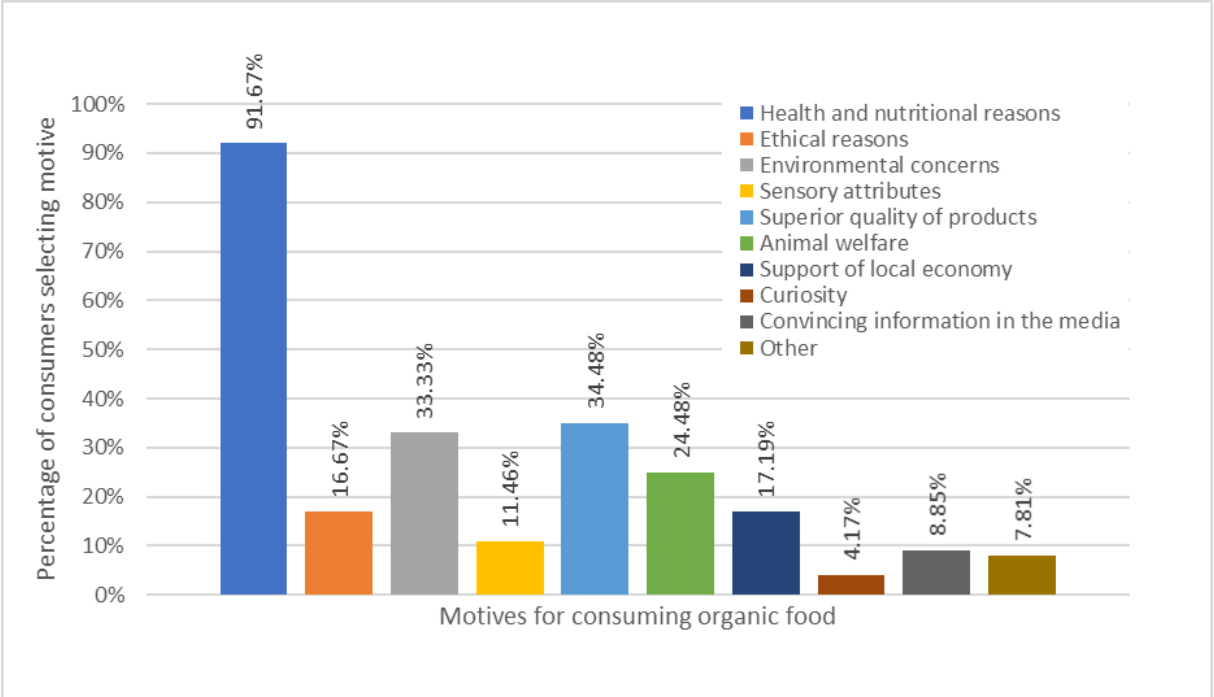

FIGURE 2: ORGANIC FOOD CONSUMER MOTIVES FOR CONSUMING ORGANIC FOODS (N=192)

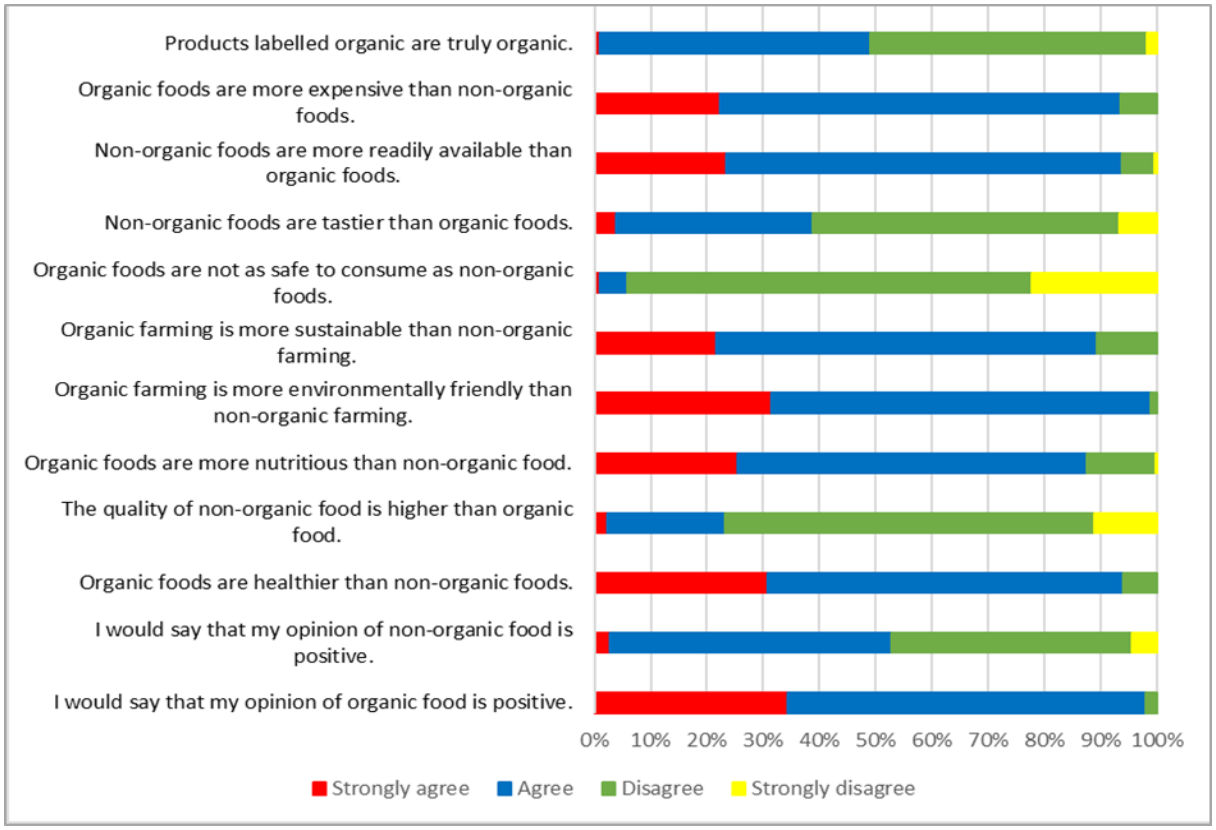

FIGURE 3: PERCEPTIONS OF QUESTIONNAIRE PARTICIPANTS RELATING TO ORGANIC FOOD (N=337)

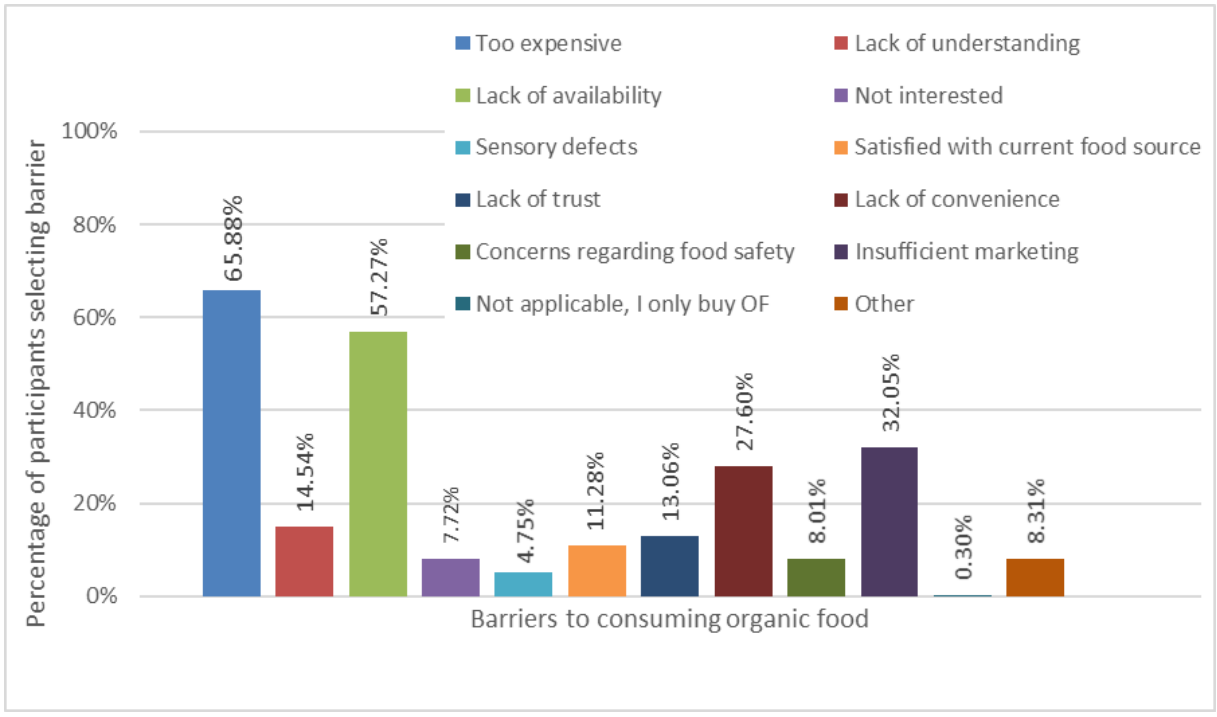

FIGURE 4: BARRIERS TO CONSUMING ORGANIC FOODS (N=337)

discussions were; superior taste, health reasons, ethical reasons, environmental impact, animal welfare, support of the local economy, nostalgia and curiosity.

Perceptions relating to organic food

Positive responses (agree/strongly agree) and negative responses (disagree/strongly disagree) respectively were pooled and are reported accordingly below. The majority (97.9%; n=330) of participants had a positive opinion of organic food. Participants perceived organic food to be more environmentally friendly (98.8%; n=333), healthier (94.1%; n=317), more sustainable (89.3%; n=301), and more nutritious (87.5%; n=295) than CF (Figure 3).

From a contingency table and subsequent maximum likelihood Chi-square test, Chi-square (1 df) = 5.42, with p-value p=0.02, it was clear that significantly more females (80.9%; n=174) than males (69.7%; n=85) disagreed/strongly disagreed that the quality of CF is higher than organic food. Similar results were found relating to the perception that CF is tastier than organic food. Significantly more females (67.0%; n=144) than males (50.8%; n=62) disagreed/strongly disagreed with this statement (Chi-square (1 df) = 8.49 with p=0.004).

Participants with a higher degree or diploma 56.4% (127 from 225) disagreed/strongly disagreed that foods labelled organic are truly organic, while for those with grade 12 level education, only 33% (27 from 81) disagreed/ strongly disagreed. The majority of participants with lower levels of education agreed/strongly agreed that foods labelled organic are truly organic. This contingency table analysis yielded chi-square (3 df) =15.57 with p = 0.00054.
Similar contingency table analyses with maximum likelihood chi-square tests were used in the following. Relating to dietary practices, significantly more (p=0.020) participants that followed a specific eating plan (100.0%; n=109) than those that did not (96.9%; n=221), had a positive opinion of organic food. Participants were more likely to have a positive opinion of organic food with an increase in their frequency of organic food consumption (p=0.013). ROFC (56.3%; n=85) were more likely to disagree/ strongly disagree that they had a positive opinion of CF, while the majority of OOFC (58.5%; n=24) and NOFC (60.7%; n=88) agreed/strongly agreed that they had a positive opinion of CF (p=0.010). One hundred per cent (n=41) of OOFC, 96.7% (n=146) of ROFC and 88.7% (n=130) of NOFC agreed/strongly agreed that organic food is healthier than CF (p=0.003). The perception that organic food is more nutritious than CF was directly associated with frequency of organic food consumption (p<0.001) with 96.0% (n=145) of ROFC, 95.1% (n=39) of OOFC and 76.6% (n=111) of NOFC believing that organic food is more nutritious than CF.

Themes relating to focus group participants' perceptions of organic food are summarised in Table 4. Across all three consumer groups, focus group discussion participants perceived organic food to be healthier and more nutritious.

> ROFC: *Just in terms of health and long-term health and how you feel today, it [organic food] makes a big difference.*
>
> OOFC: *It [organic food] is so much healthier; it is so different for me.*
>
> NOFC: *I just feel like they [organic food] are far more nutritious, and I feel like the value in there is so much more.*

ROFC shared the perception that their personal food choice not only affects their own health, as was the case with OOFC and NOFC, but also that of the planet and animals.

> ROFC: *If you are aware of what you are putting into your own body, you will stop throwing all the rubbish into the oceans, the rivers, the seas, the roadside because that is going to impact the creature you just ate or the vegetables you just ate. It affects everything.*

All consumer groups perceived organic food to be more expensive and less available. When

asked how organic food prices make them feel, the three consumer groups responded very differently. ROFC were less concerned about price and responded to the question by finding solutions to make organic food more affordable. OOFC were frustrated that they have to pay more for organic food, whereas in the past, organically grown food was the norm and not so expensive.

> OOFC: *I feel like it [organic food] is a term that just popped out of nowhere. Now we have to pay more for something that we used to do naturally. Organic food was just food. It wasn't organic food; it was just food.*

NOFC, in general, felt that it is not worth paying more for organic food. Although the price might be justified, they would rather buy the cheaper product.

Knowledge and understanding of organic food

Participants associated the term *organic food* with concepts such as "no pesticides/chemicals/ poisons", "no additives", "no genetically modified organisms", "no antibiotics", "no hormones", "no fertilisers", "free-range", "no preservatives", "healthy", "unprocessed", "natural", "sustainably farmed", "environmentally friendly" and "animal welfare".

The total mean knowledge score for participants was 57.6% ± 24.29. The question on the use of synthetic pesticides scored the highest percentage (83.1%; n=280) of correct answers. The question that scored the lowest percentage of correct answers (40.1%; n=135) related to the legislation on organic food products in SA (Table 5). There was a significant positive correlation between organic food knowledge score and age (p=0.003, r=0.16). A significant negative correlation between the number of children in the household and organic food knowledge (p=0.01, r= -0.15) was found. Using one-way ANOVA of organic food knowledge versus income (F(3,333) = 4.05 with p=0.0075) and LSD multiple comparisons, participants falling in the highest income bracket (R102 401 or more) had a significantly higher mean organic food knowledge score than individuals falling in lower -income brackets. A similar ANOVA (F(2,334) = 3.06, with p=0.048) between organic food knowledge and frequency of organic food consumption and LSD comparison, shows that ROFC obtained a significantly higher (p=0.048) organic food knowledge score (total mean score: 60.9%) than NOFC (total mean score: 53.1%). No such significant difference was evident between OOFC and ROFC or between OOFC and NOFC.

In general, focus group participants understood organic food to mean: no pesticides; no fertiliser; no chemicals; natural; healthy; humane treatment of animals. Participants' understanding of organic food differed across consumer groups. ROFC emphasised the fact that organic food is produced via organic methods of farming according to organic standards.

> ROFC*: It [organic food] is grown in a certain way that has to adhere to the standards of organic food.*

Among the majority of OOFC, there was a general lack of understanding surrounding the concept of organic food. Participants were familiar with organic food labels but unsure about what organic farming entails.

> OOFC: *You read organic food on a [names retail store] packet, but then you are like what is it then really? Or how is it farmed, how is it stored? How is it processed?*

To NOFC, organic food was synonymous with healthy and natural.

Organic food barriers

Participants were allowed to select more than one barrier. The most commonly mentioned barriers to the consumption of organic food (Figure 4) were cost (65.9%; n=222) and a lack of availability (57.3%; n=193).

During focus group discussions, price, lack of convenience and lack of availability, were barriers across all three consumer groups. There was also a general lack of trust, across all three consumer groups, relating to organic food farming methods, certification, regulation and labelling. Organic food barriers differed across consumer groups. ROFC were less likely to discuss their own perceived barriers and more likely to discuss barriers that did not, per se, apply to themselves.

> ROFC: *So, it is also conditioning. Starting from very early [referring to other people's children that have been conditioned to want perfect looking food]. My kids will obviously lookout for the same things as me [produce that looks organic]. They would go: oh, mom, organic!*

OOFC perceived a lack of availability and a lack of convenience to be major barriers to organic food consumption.

> *You get a [names grocery store] around every corner. If we walk out here now, we would walk no further than 2km, and we will get a general retailer, but if we want to buy organic, every Sandton mom loves an organic smoothie in the morning, but I still think we are going to have to walk further than 2km to get anything organic.*

Among NOFC, price, satisfaction with current food sources and a lack of interest, were major barriers and rang true for all participants in the group.

> *A banana is a banana, whether you buy an organic or an ordinary banana. You pay R10 more for organic; it is a bit too much! It is not worth it always.*

DISCUSSION

Demographics characteristics and frequency of organic food consumption

Most of the study participants were female. In SA, research indicates that females are primarily responsible for household food procurement (Koen *et al.* 2018; Shisana *et al.* 2014). The large percentage of ROFC may be explained by the fact that consumers who did not have a good understanding of the term organic food were excluded from the study. It was anticipated that consumers who do not have an understanding of what organic food means were less likely to consume organic food. It has been established in the literature that organic food consumption is associated with certain consumer profiles and characteristics (Eisinger-Watzl *et al.* 2015; Hughner *et al.* 2007; Kesse-Guyot *et al.* 2013). However, this study found very few significant demographic differences across consumer groups; study participants did not fall into typically defined consumer segments. This study had similar findings to Du Toit and Crafford (2003) in that South African organic food consumers were typically older. Organic food consumption is often associated with a healthy lifestyle (Eisinger-Watzl *et al.* 2015) and healthy dietary practices (Baudry *et al.* 2015; Eisinger-Watzl *et al.* 2015). Although no relationship was found between lifestyle practices (smoking, alcohol consumption and physical activity) across consumer groups, participants following a specific eating plan significantly increased with organic food consumption. This is consistent with research which often portrays organic food consumers as health-conscious and more concerned with nutrition (Eisinger-Watzl *et al.* 2015). They are also more likely to follow international dietary guidelines (Baudry *et al.* 2015) and be vegetarian or vegan (Baudry *et al.* 2015; Petersen *et al.* 2013).

Practices: purchasing practices

As reported in other research (Vermeulen & Biénabe 2007; Vermeulen & Biénabe 2010), general supermarkets were the main source of

food procurement. However, participants shopped for food more frequently when compared to findings from other research conducted in SA (Koen *et al.* 2018). This may be explained by the study population being biased towards a higher socio-economic class than the average South African consumer. Results from the current study showed that approximately two -thirds of the participants purchased organic food. Vermeulen and Biénabe (2010) and Du Toit and Crafford (2003) have respectively reported that 36% and 93.3% of South African consumers purchase organic food, even if at irregular intervals.

Practices: organic food consumption and consumer motives

The most common food types consumed organically were vegetables and fruits. These results correlate well with results presented in both national and international literature, namely that vegetables and fruit are the most common food groups purchased organically (Kesse-Guyot *et al.* 2013; Oates, Cohen & Braun 2012; Van Loo *et al.* 2013; Vermeulen & Biénabe 2010). This might be due to the fact that organic food consumers tend to have a higher consumption of fruit and vegetables (Eisinger-Watzl *et al.* 2015; Petersen *et al.* 2013). General supermarkets were the most common source of organic food for participants. This may be explained by the majority of study participants doing their food shopping at general supermarkets. In SA, it has been reported that 90% of organic food is sold through the formal sector (Kelly & Metelerkamp 2015). Participants were primarily motivated to consume organic food for health and nutritional reasons. Congruent with both the national and international literature, perceived health benefits of organic food stand out as the predominant motive driving organic food consumption (Hughner *et al.* 2007; Massey *et al.* 2018; Vermeulen & Biénabe 2010). Participants were also motivated by the belief that organic food is of superior quality, is more environmentally friendly and is humane towards animals. These results are in line with findings from a recent meta-analytic study (Massey *et al.* 2018) showing that consumers are, to a larger extent, driven by credence attributes (the perception that organic food is healthier, safer, more nutritious, of a higher quality and better for the environment and animals). However, study findings contradict previous research showing that environmental concerns were not a major motive for organic food consumption among South African consumers (Vermeulen & Biénabe 2010). Study participants here were highly motivated by sustainability dimensions that include environmental concerns, animal welfare and the procurement of locally produced food products. This could be indicative of South African consumers becoming increasingly more aware of the environmental and sustainability impact of their diet. Findings suggest that participants' motives for consuming organic food are very much in line with their positive held perceptions of organic food.

Organic food perceptions

Participants mostly had positive perceptions of organic food. In general, participants' perceptions of organic food were more positive, with an increasing frequency of organic food consumption. Similar findings have been reported in the literature (Van Loo *et al.* 2013). Most participants perceived organic food to be more environmentally friendly, healthier, more sustainable, and more nutritious when compared to CF. These positively held perceptions are consistent with both national (Du Toit & Crafford 2003; Vermeulen & Biénabe 2010) and international literature (Hughner *et al.* 2007). Congruent with national literature (Du Toit & Crafford 2003; Vermeulen & Biénabe 2010), the current study participants rated organic food higher than CF with regards to quality, safety and taste. However, in the international literature, consumers held less favourable perceptions of organic food regarding the taste (Massey *et al.* 2018). Interestingly, when considering perceived taste differences, blind tests that were conducted showed no difference between organic food and CF with regard to taste, smell or texture (Hemmerling *et al*. 2015;

Zhao *et al.* 2007).

Common negatively held perceptions in the literature on organic food mainly pertain to price and availability (Du Toit & Crafford 2003; Hughner *et al.* 2007; Van Loo *et al.* 2013; Vermeulen & Biénabe 2010) Our findings are in line with the literature on this. Respondents' negative held perceptions with regard to the availability of organic food can probably be expected since, in general supermarkets, the predominant food procurement outlet reported by study participants, organic food is less available than CF. Interestingly, it has been reported that organic food consumers' perceptions of organic food are often shaped by their perspective that a higher price is synonymous with better quality (Hill & Lynchehaun 2002).

The majority of participants did not trust that food labelled as organic is truly organic. Local data are in line with results from our study and suggests that South African consumers do not trust that foods labelled organic are truly organic (Vermeulen & Biénabe 2010). Participants' lack of trust is probably justified, as there is currently no specific legislation pertaining to organic products in SA (Tung 2016).

Organic food knowledge and understanding

As with the national and international literature, "organic" was associated with terms such as "no chemicals"; "no pesticides"; "no poison used" "free-range", "natural", "healthy", "animal welfare", "environmentally friendly" (Rousseau 2015; Vermeulen & Biénabe 2010).

Study participants had a total mean organic food knowledge score of 57.57%. A South African study focusing on middle and upper socio-economic groups in Gauteng had found that, among consumers purchasing organic food, 85% had a good knowledge of organic food and that consumer knowledge significantly increased with higher education levels (Vermeulen & Biénabe 2010). In this study, no such apparent differences in total mean organic food knowledge scores were found across different levels of education. ROFC obtained a significantly higher knowledge score than NOFC. These results are in line with data obtained from the focus group discussions. Participants' understanding of organic food differed across consumer groups, with ROFC having a more accurate understanding of organic food. A South African study had earlier shown that a "lack of understanding" is the most common factor hindering organic food consumption among NOFC (Vermeulen & Biénabe 2010).

Organic food barriers

In the literature, the major factors that hinder organic food consumption are high prices, lack of availability, lack of trust, lack of marketing, lack of understanding, satisfaction with the current food source and cosmetic defects (Aschemann-Witzel & Zielke 2017; Massey *et al.* 2018). Findings from the current study are similar to the most commonly reported barriers being price, a lack of availability and insufficient marketing. Price is a major barrier dissuading consumers from purchasing organic food (Hughner *et al.* 2007; Massey *et al.* 2018). Organic food is often associated with a price premium. This is evident in a study that reported premiums on organic food in South Africa, ranging from 18-112% (Vermeulen & Biénabe 2007). However, despite these price premiums, the majority of participants reported that they would still purchase an organic product even if the price were higher than a non-organic alternative. Willingness to pay a price premium for organic food products can be found in national (Nielsen 2017), as well as international literature (Batte et al. 2007; Magkos, Arvaniti & Zampelas 2006). Furthermore, this willingness to pay a price premium, across consumer groups, increased with organic food consumption. However, consumers' willingness may have its limits as it has been reported that South African organic food consumers are price sensitive with their willingness to purchase organic food decreasing with an increase in price premium (Vermeulen & Biénabe 2010).

Among South African consumers, the primary barriers to purchasing organic food have previously been reported to be a lack of availability (37%), followed by price (26%) (Nielsen, 2005). However, the current study participants perceived price to be a superior barrier to organic food consumption as opposed to a lack of availability. This may possibly be explained by increases in organic food price premiums as well as an increase in the availability of organic food products since that study was conducted.

CONCLUSION

The research aimed to determine the knowledge, practices, perceptions and the barriers of adult consumers in Johannesburg, in regard to organic food purchase and dietary inclusion. A paucity of national literature on the topic of South African consumers as it relates to organic food had been apparent.

Insights into participants' organic food knowledge, practices, perceptions and barriers may impact health-care professionals' practices as it relates to patient education and diet-related recommendations provided. Patients education on the topic of organic food should enable individuals to make an informed decision on whether or not to include organic food in their diet. Producers, retailers and relevant stakeholders may use insights to inform and drive their practices as they relate to organic food. Furthermore, findings might ultimately promote research-informed legislation and policies as there is currently no specific legislation relating to organic products in SA.

As with all studies, there are limitations, including the narrow geographic scope and the bias towards more affluent consumers. Furthermore, only participants with a good understanding of organic food were included: consumers that did not have a good understanding of organic food were intentionally excluded to ensure that the data collected were valid. In doing so, the frequency of consumption is likely biased towards higher organic food consumption as it is assumed that consumers not having an understanding of organic food are less likely to be consuming organic food. Due to limited resources and the low response rate of focus group participants, intergroup data saturation was not reached. However, quality assurance is strengthened by the convergent mixed methods study design which allowed for the comparison and contrasting of quantitative with qualitative findings to enhance the validity of the results. The representativeness of the study sample is not guaranteed, so findings cannot be generalised to the larger South African consumer population and may be representative only of these participants.

For future research, it could be of value to investigate the dietary practices of South African consumers more widely, across consumer groups, as they relate to organic food. It has been reported in the international literature that organic food consumers have a higher consumption of fruit, vegetables, whole grains and legumes and lower consumption of red and processed meat than CF consumers. These dietary habits are in accordance with the current South African Food Based Dietary Guidelines, in particular, "Eat plenty of vegetables and fruit every day", "Eat dry beans, split peas, lentils and soya regularly" and "Make starchy foods part of most meals" (Food and Agriculture Organization 2013). It is hoped that the study findings will advance the organic food knowledge base with relevance for health-care professionals and marketers, as well as policymakers.

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CONFLICTS OF INTERESTS

We confirm that there are no known conflicts of interest associated with this publication, and there has been no significant financial support for this work that could have influenced its outcome.

AUTHOR CONTRIBUTION

The principal researcher, NE, developed the idea and the protocol for this research study, planned the research, undertook data collection (with the assistance of trained research assistants), captured the data for analyses, interpreted the analyses and drafted the article. The data were analysed at the Centre for Statistical Consultation at Stellenbosch University Fellow researchers, NK and YS provided input at all stages and revised the protocol and article.

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