

A study of the relationship between health awareness, lifestyle behaviour and food label usage in Gauteng

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Abstract

Background: The objectives of the study were to determine whether consumers who read food labels, were also more aware of health and lifestyle issues, in terms of nutrition and other health-related lifestyle behaviours, and whether there was a relationship between food-label reading, health awareness and lifestyle behaviour. A quantitative descriptive (survey) design was selected to investigate the relationship between food-label reading on the one hand, and health awareness and lifestyle behavior on the other.

Method: A two-stage, stratified-proportionate and systematic sampling strategy was applied to select a sample of 357 Gauteng respondents to complete a telephonic questionnaire. Respondents who were most likely to read food label information were selected. Food label information is prescribed by comprehensive label legislation. Data report on respondents' label-reading habits, attitudes towards health awareness, lifestyle behaviour and biographic data. Nonparametric analysis, scale reliability tests, analysis of variance (ANOVA) and Bonferroni multiple comparisons of means tests were used to analyse the results.

Results: Results indicate that the two-thirds of respondents who, to some extent read nutritional information on food labels, were concerned about their personal health, were interested in health-related information, and followed a healthy lifestyle, such as regularly eating fresh fruit and vegetables, cutting back on alcohol, and other positive lifestyle behaviours. They were unsure about how their own knowledge of nutrition, and their understanding of nutrition information on food labels, compared with that of other consumers.

Conclusion: A relationship was found between patterns of reading food labels, health awareness and lifestyle behaviour. People who often read food labels were more health-conscious, and maintained a healthier lifestyle.

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Introduction

The World Health Organization (WHO) advocates that consumers should adopt healthier lifestyle behaviour, and has put international strategies in place that promote healthier eating patterns, in support of a healthier lifestyle.^{1,2} In March 2010, South Africa published the first phase of its new food-labelling legislation to reinforce this. The legislation intends to create better health awareness, and subsequent improved lifestyle behaviour among South African consumers.^{3,4} A healthy lifestyle is defined as "orientation toward the prevention of health problems, and the maximisation of personal well-being".⁵ USA consumers, who followed a healthy lifestyle, were found to average a higher consumption of fruit and vegetables, were largely female, had a higher level of education, and were predominantly older than consumers who adhered to an unhealthy lifestyle.⁶ Most of these indicators contribute towards Kraft and Goodell's idea of "wellness-orientated" consumers who accept responsibility for their

own health through their daily lifestyle practices, including food-purchasing choices.^{7,8}

Unhealthy food choices have been blamed partially for the worldwide increase in obesity.⁹ The Medical Research Council's technical report on chronic diseases of lifestyle in South Africa, conducted between 1995-2005, indicated that there was a high prevalence of obesity in South Africa, with nearly 56% of women, and 29% of men, being either overweight, or obese.¹⁰ These figures suggest that if healthy food choices and improved lifestyle behaviour are not promoted at an early age, obesity will become an even greater concern in the future. International food companies, blamed for the unhealthy food choices that consumers make, are being forced to address better nutrition by developing healthy product lines to improve the quality of food offered to consumers.^{11,12}

Food labelling in South Africa also has a purpose to inform and indirectly assist the consumer in making healthier food choices

through which lifestyle diseases such as obesity can be addressed, and lifestyle behaviour improved.^{13,14} It is generally accepted that, at the very least, food labels contain nutrition and ingredient information that could assist consumers to make better food choices, although such information may not necessarily affect food choice.^{15,16} The authors designed a study to determine whether Gauteng consumers who claim to read food labels, were also more conscious of their health and lifestyle, in terms of nutrition and other health-related lifestyle behaviours, and whether there was a relationship between reading food labels, health awareness, and lifestyle behaviour.

Background

A quantitative exploratory design was selected for the study, and a questionnaire was designed to collect information on consumers' label-reading habits, lifestyle behavior, health awareness, and biographical properties. A requirement of the randomised cross-sectional design was that respondents had to be randomly selected.

Method

Almost one-third of food expenditure in South Africa takes place in Gauteng, which made it a suitable choice of province in which to conduct food label research. The quantitative nature of the research called for a survey design to evaluate the health and lifestyle behaviour of a target population of consumers who read food labels. The questionnaire was conducted telephonically. A telephonic questionnaire was decided upon, since the sampling technique provided the researchers with telephonic contact details, and allowed the researcher to obtain the informed consent of each respondent, before the questionnaire was conducted. The sampling units consisted of adult consumers (21 years of age and older), in identified populated sectors of Gauteng, who purchase packaged food and groceries, and who are most likely to read food labels. The sectors covered included Pretoria, Johannesburg, West Rand, East Rand and the Vaal Triangle.

Sample design

Sampling consisted of a two-stage, stratified-proportionate and systematic random sampling strategy. This method accommodated the fact that population density and financial wealth in different parts of Gauteng vary considerably. Population-density strata were identified, and the five most populated strata selected. Sample size was proportionately calculated according to stratum population density. The Gauteng telephone directory provided an inexpensive alphabetical list of surnames from which to choose. For each stratum, a starting point was randomly selected, and an allocated number of respondents systematically chosen from the starting point onwards, by selecting every n^{th} entry in the strata directory (where "n" is calculated as part of the systematic sampling technique). Listings of cellular numbers were not freely available per strata. Since research funding was limited, the use of landlines, rather than from cellular phones, to conduct the telephonic interviews, provided a more cost-effective method of questionnaire administration. After informed consent was obtained, questionnaires were administered in English.

Only respondents who personally bought food and groceries were included in the study, as they were expected to be the most likely to read food labels (Question 1.1 acted as a screening tool).

The total sample size was set to 357. One-hundred and seven respondents were selected from Johannesburg (proportion 0.30), 78 from Pretoria (proportion 0.22), 86 from the East Rand (proportion 0.24), 61 from the West Rand (proportion 0.17) and 25 from the Vaal Triangle (proportion 0.07). The sample of most likely food label readers in Gauteng was representative with respect to population density, race (black and white consumers), and economic strength of Gauteng food consumers who probably read food labels.

Measuring instrument, data collection and scope of the study

A literary review and previous research identified five aspects of health and nutritional awareness that suggested important links to nutritional information on food labels. These aspects guided the design of the questionnaire, which included questions on patterns of packaged-food buying, health and lifestyle attitudes, views on food labelling and label information, consumers' nutritional knowledge, and biographical information.

The biographical section probed respondents' gender, age, race, household composition, monthly income and food expenditure. Nutritional knowledge regarding health, lifestyle and nutritional awareness, was evaluated against closed-ended, three-option-response questions. Behaviour related to buying packaged food was evaluated against five closed-ended questions about appearance, brand, nutritional labels, cost implications, and frequency of use.

Three attitude statements evaluated health, lifestyle, and nutritional perceptions, using a five-point Likert scale. Nineteen questionnaire statements were derived from a health consciousness scale and a preventive health behaviour scale.¹⁷

Before it was telephonically administered, the questionnaire was piloted by six trained operators of the Computer Assisted Telephone Interviewing (CATI) system. Each question, together with the answer options, was read by the operator, after which the selected answer was fed into the capture screen. The anonymity of each respondent was assured, as no personal detail was captured that could locate, or reveal, his or her identify. As a quality control measure, the CATI system was monitored in a five-question test procedure during questionnaire administration. Follow-up telephonic interviews were also conducted on a subsample of respondents as a final quality control measure. Data was electronically captured into the Statistical Package for the Social Sciences (SPSS).

To do justice to the overall results of the study, the article reports on the relationship between respondents' food-label reading habits, health awareness and lifestyle behaviour.

Data analysis strategy

The analysis strategy was designed to investigate consumers' label-reading habits, their health awareness, their lifestyle behaviour, and the relationships between these variables. Nonparametric one-way, two-way, and composite frequency tables, were calculated on the

biographical reading frequency, health awareness, and lifestyle variables. Where applicable, chi-square tests were calculated. Results described the consumer sample (refer to the section *Demographics of food-label readers*) and gave an overview of healthy lifestyle and food-label reading habits (Tables I-II).

Scale reliability testing was conducted to validate the internal consistency reliability of the constructs defined as “health awareness” and “lifestyle behaviour”. This ensured that the analysis of relational effect of consumers’ label-reading habits on either their health awareness or lifestyle behaviour (which were investigated in analyses of variance and Bonferroni multiple comparisons of means tests), were conducted on construct scores that truly represented awareness and lifestyle. Analysis of variance findings are presented in Tables III and VI and are discussed in the section *Relational effect of health awareness and lifestyle behaviour on label-reading patterns*. Bar graphs (Figures I and II) illustrate the proportionate relational trends between the variables.

Results and interpretation

Demographics of food label readers

Background information on the sampled consumers was derived from frequency tables on biographical attributes (these tables are not included in this article), and indicated that the majority of the respondents (n = 357) were over the age of 46 years (51.5%), and predominantly female (82.3%). Black (49.6%) and white (42%) population groups were better represented than Indians (6.8%) and coloureds (1.7%). Seventy-six per cent of households had a disposable monthly income of less than R10 000. One-third (32.7%) spent more than R1 000 on food and groceries per month, and just over a third (41.7%) spent between R501-R1 000 per month. Twenty-five per cent (25.6%) spent less than R500 on groceries.

Frequency of food-label reading

Consumers who read food labels were well represented in the sample, as 71% of respondents indicated that they “often” read (31.9%), and “sometimes” read (39.9%) nutritional information on food labels. Less than one-third (28.3%) reported to have never read food labels.

Attitude towards general health awareness

Table I reflects health awareness attitudes, evaluated against the seven health awareness statements, and gives an exploratory overview of respondents’ health awareness perceptions.

In Table I, the column totals for the “agree” and “strongly agree” categories over all the responses add up to 1 795 (or 72%) of the total responses of 2 498, which indicates general agreement, or a positive perception towards health awareness. Furthermore, the response pattern for the second statement pertaining to an interest in personal health information, exhibits the highest proportion of agreement, namely 85.71% (51.54% +34.17%), with the lowest proportion of indecision, indicating definite interest. Respondents also expressed definite agreement (namely 81.2%, (46.50% +35.29%) regarding

the third statement on continual concern about personal health, but seemed to differ in their response pattern to the second statement, in that 12% reported indecision. The response pattern regarding personal knowledge of reading food labels (the fourth statement), indicated that respondents have a reserved perception of their own knowledge, in comparison to that of others.

A substantial proportion of respondents were undecided as to whether they read more health-related articles than they did three years ago, knew more about nutritional food labels than other consumers, and had confidence in their comprehension of food label information (12.89%; 34.73% and 22.13%; statements 1, 4 and 5 respectively).

Frequency of lifestyle behaviour

The lifestyle behaviour items listed in Table II address the nutritional and health-related components of lifestyle behaviour. Items 1-9 are nutrition-related, and items 10-14 are health-related lifestyle behaviour items. The column totals for the “agree” and “strongly agree” categories over all lifestyle behaviour responses, which add up to 3 354 (or 67%) of the total responses out of 4 982, indicate general agreement about, or a positive perception towards healthy lifestyle behaviour.

Table II indicates that there was overwhelming agreement on the regularity with which fresh fruit and vegetables should be consumed (total 91.6%: 38.66% “often”, 52.94% “always”). A healthy lifestyle attitude was also reflected in the statement that alcohol consumption should be monitored, with 77.6% indicating “often” to “always” adherence, and 51% indicating “always”. A well-balanced diet (79.27% “often”) and no smoking (76.75% “often-to-always”) were also linked to healthy behaviour.

Table II indicates that 34.55% of respondents perceived a nutritional lifestyle to encompass “often” cutting back on snacks and treats, and 18.54% as “often” doing so (cumulative 53%). However 22% indicated indecision. Unhealthy habits were exhibited in “seldom” (17.09%) to “never” (14.01%) category responses to having regular exercise (cumulative 31%), together with indecision (25.77%) and limited avoidance (23.25%) categories relating to avoidance of foods containing additives and preservatives.

Relational effect of health awareness and lifestyle on label-reading patterns

Tables I and II provided an overview of attitudes towards health awareness and lifestyle behaviour. However, to investigate the relationship between label reading patterns (with frequency of reading categories of “always”, “sometimes” and “never”), and health awareness on the one hand, and label-reading patterns and lifestyle behaviour, on the other, a single measure of health awareness, and likewise a single measure of lifestyle behaviour was sought.

Health awareness and lifestyle behaviour measures were calculated as health awareness and lifestyle construct scores, once internal consistency reliability had been established for both these constructs.

Table I: Attitude towards general health awareness and (n-by-m) Chi-square test of independence

Health awareness statements: "I am..."	Health awareness ratings (frequency, cell qui square, row percentage)					Total
	Strongly disagree	Disagree	Unsure	Agree	Strongly Agree	
Reading more health-related articles than three years ago	19 5.32	45 12.61	46 12.89	163 45.66	84 23.53	357
Interested in health information	6 1.68	19 5.32	26 7.28	184 51.54	122 34.17	357
Continually concerned about personal health	4 1.12	19 5.32	42 11.76	166 46.50	126 35.29	357
More knowledgeable about nutritional information on food labels than other consumers	21 5.88	49 13.73	124 34.73	123 34.45	40 11.20	357
Confident, and understand nutritional information on labels	23 6.44	28 7.84	79 22.13	166 46.50	61 17.09	357
Concerned about harmful ingredients in foods	8 2.24	33 9.24	45 12.61	172 48.18	99 27.73	357
Interested in nutrition	5 1.40	20 5.62	42 11.80	183 51.40	106 29.78	356
Total	86	213	404	1157	638	2498

Frequency missing = 1

Table II: Frequency of lifestyle behaviour and (n-by-m) chi-square test of independence

Nutritional behaviours	Frequency of lifestyle behaviour (frequency, cell qui square, row percentage)					Total
	Never	Seldom	Unsure	Often	Always	
Eat a well-balanced diet	5 1.40	19 5.32	50 14.01	154 43.14	129 36.13	357
Eat fresh fruit and vegetables	2 0.57	16 4.48	12 3.36	138 38.66	189 52.94	357
Watch salt content in diet	40 11.24	53 14.48	48 13.48	121 33.99	94 26.40	357
Watch amount of fat consumed	24 6.76	41 11.55	39 10.99	143 40.28	108 30.42	355
Pay attention to sugar intake	19 5.35	43 12.11	38 10.70	148 41.69	107 30.14	354
Pay attention to amount of red meat consumed	28 7.91	48 13.56	54 15.25	142 40.11	82 23.16	356
Lifestyle behaviours						
Exercise regularly	50 14.01	61 17.09	45 12.61	119 33.33	82 22.97	355
Cut back on snacks and treats	31 8.71	58 16.29	78 21.91	123 34.55	66 18.54	356
Avoid foods with additives and preservatives	33 9.24	50 14.01	92 25.77	106 29.69	76 21.29	357
Rest and sleep enough	8 2.25	52 14.65	45 12.68	149 41.97	101 28.45	355
Reduce stress and anxiety	10 2.82	63 17.75	76 21.41	131 36.90	75 21.13	355
Maintain work-and-play balance	12 3.39	56 15.82	66 18.64	154 43.50	66 18.64	354
Restrict alcohol consumption	14 3.92	22 6.16	44 12.32	94 26.33	183 51.26	357
Avoid smoking	38 10.64	12 3.36	33 9.24	36 10.08	238 66.67	357
Total	314	594	720	1758	1596	4982

Frequency missing = 16

Cronbach alpha coefficients of 0.86 and 0.84 were determined for health awareness and lifestyle, which validated internal consistency reliability. Separate health awareness and lifestyle scores were then calculated as the mean response of questionnaire-item responses, that either defined health awareness (seven questionnaire statements), or lifestyle (14 questionnaire statements). The two sets of constructs scores can be interpreted according to the same agreement rating scale defined for the questionnaire, since the scores were derived from questionnaire responses.

Analyses of variance were used to investigate whether statistically significant relationships could be established between respondents' label-reading patterns and health awareness, and likewise, between label-reading patterns and lifestyle behaviour. In the two separate analyses, respondents' label-reading information was entered as the explanatory variable in the model, and either health awareness, or lifestyle behaviour, scores, as the independent variable. Bonferroni multiple comparisons of means tests were also conducted on the frequency-of-label-reading category mean scores for both health awareness and lifestyle scores, to determine in more detail how frequency of reading ("never", "sometimes", "always") influenced health awareness and lifestyle. The results are presented in Table III and IV.

The analysis of variance (ANOVA) results in Table III and IV indicate that statistical significance of the effect of label-reading could be established for both health awareness (F-probability, associated with the F-statistic, of 41.42, indicates significance at the 0.1% level), and lifestyle attitude (F-probability, associated with the F-statistic, of 4.912, indicates significance at the 1% level).

Mean awareness and lifestyle construct scores calculated according to label-reading categories (indicated in the last column of Table III and IV), and compared in Bonferroni multiple comparisons of means tests, indicated that the lifestyle attitude and health awareness of respondents who read food-label information was significantly higher than that among those who did not read this information. These relationships are illustrated in the bar graphs of awareness and lifestyle mean scores in Figures 1 and 2, for the reading categories of "never", "sometimes" and "always read". Both bar graphs clearly indicate that, proportionately, label-reading increases as either health awareness or healthy lifestyle increases. For example, the frequency ratios of "always" readers to health awareness levels are: $1/2 = 0.5$; $0/18 = 0$; $9/39 = 0.23$; $62/204 = 0.30$; $42/61 = 0.69$.

Figures 1 and 2 illustrate the proportionate relational trends between the variables.

Discussion

This exploratory study, which was conducted interviewing respondents who were most likely to read food labels in Gauteng, was a first attempt to learn more about Gauteng consumers' food-label reading behaviour, and to guide future studies to enable generalisation to the broader South African community. Approximately two-thirds of the respondents in the study reported reading nutritional information on food labels, to some extent. But these findings should be viewed with caution, as self-reported reading of food labels appears to be common in research, and might overestimate actual behaviour.¹⁸

Table III: Analysis of variance and Bonferroni multiple comparisons on means tests for health awareness

Analysis of variance results conducted in health awareness scores.								
Health awareness mean scores according to label reading frequency categories								
Source	DF	Sum squares	Mean square	F-value	Pr>F	Bonferroni test (Isd = 0.2067, df = 354)		
						Mean	N	Read
Label-reading pattern	2	35.6858548	17.8429274	41.42	< 0.0001***	4.1867 ^x	114	Always
Error	354	152.5091311	0.4308168			3.8442 ^y	142	Sometimes
Corrected Total	356	188.1949859				3.3720 ^z	101	Never

Bonferroni test: Category score means suffixed with different small letters differ statistically significantly from one another

Isd: Bonferroni least significant difference statistic, df: Degrees of freedom

Read: Food-label reading pattern has the categories of "always", "sometimes", "never" read food labels

Significance: *** 0.1% level of significance, highly significant

Table IV: Analysis of variance and Bonferroni multiple comparisons on means tests for lifestyle

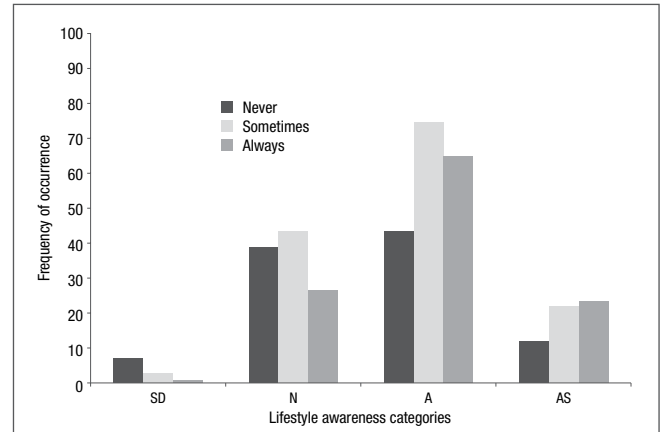
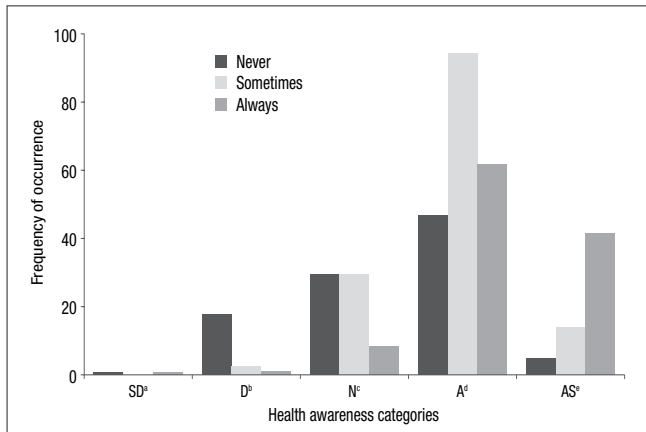
Analysis of variance results conducted on lifestyle scores.								
Lifestyle mean scores according to label reading frequency categories								
Source	DF	Sum Squares	Mean square	F-value	Pr>F	Bonferroni test (Isd = 0.2053, df = 354)		
						Mean	N	Read
Label-reading pattern	2	4.1724913	2.0862456	4.91	0.0079***	3.8765 ^x	114	Always
Error	354	150.3893672	0.4248287			3.7511 ^{xy}	142	Sometimes
Corrected Total	356	154.5618585				3.5975 ^y	101	Never

Bonferroni test: Category score means suffixed with different small letters differ statistically significantly from one another

Isd: Bonferroni least significant difference statistic, df: Degrees of freedom

Read: Food-label reading pattern has the categories of "always", "sometimes", "never" read food labels

Significance: *** 0.1% level of significance, highly significant



Figures 1 and 2: Proportional relationships between label-reading (“never”, “sometimes”, “always”), and degree of either health awareness or healthy lifestyle. Left to right: **Figure 1:** Label-reading and health awareness, **Figure 2:** Label reading and lifestyle awareness

a= strongly disagree; b = disagree; c = undecided; d = agree; e = strongly agree

Attitude towards general health awareness

The results indicate that a large number of respondents were concerned about their health, and interested in acquiring information on health topics. In general, respondents were unsure whether they knew more than other consumers about nutrition information on food labels, or whether they were able to comprehend nutrition information on food labels. This uncertainty is common, as research has pointed out that consumers still find on-pack nutrition information to be confusing, and not always easy to understand.¹⁹ However, the expectation that consumers learn more about nutrition when they read nutrition information on food labels, and subsequently increase their nutrition knowledge, still remains.²⁰ As the results indicate, the fact that respondents were interested in health information, and concerned about their health, may not be enough to spur them on to read more health-related articles.

Respondents disagreed about whether they:

- Read more health-related articles
- Wanted to know more about nutrition
- Were concerned about harmful ingredients in foodstuffs.

Lack of interest in nutritional advice and guidance raises concern about the future health of consumers.

Frequency of healthy lifestyle behaviour

The results suggest that respondents regularly consumed fresh fruit and vegetables, paid attention to the amount of alcohol they consumed, tried to avoid smoking, and cut back on snacks and treats. However, they were undecided as to whether or not they avoided foods containing preservatives and additives. Fresh fruit and vegetable consumption has been found to be one of the main indicators of a healthy lifestyle, although as an indicator of a healthy lifestyle, alcohol consumption has not been found to be very useful. Healthy consumers may consume moderate levels of alcohol, which does not necessarily affect their health status.⁶ Results also indicated that respondents did not exercise regularly. This is also a healthy lifestyle indicator.⁶

Relationship between food-label reading, health awareness and lifestyle behaviour

The second purpose of the study was to determine whether there was a relationship between food-label reading, health awareness, and lifestyle behaviour. The results confirm that relationships exist between food-label reading patterns, and health awareness and lifestyle behaviour. This indicates that those who read food labels often, are more health-conscious and maintain healthier lifestyles than those who do so less often. Independent South African research on how to improve consumers' knowledge and attitudes towards nutritional information on food labels, found that health-conscious consumers were active in seeking product information. In the current study, this supports the relationship that exists between health awareness and label-reading patterns.²¹ For some consumers, the use of food-label information may also be spurred by their diet, eating strategies, or health issues.²²

Conclusion

The fact that a relationship between reading food labels, and health awareness and a healthy lifestyle, exists, and that it could be validated in this study statistically, confirms that food labels are a useful source of information through which a consumer's food choices can be shaped. New food-labelling legislation needs to promulgate a healthy lifestyle through the use of food labels, to encourage more consumers to engage with the label information. Although the current study indicated a relatively high level of label-reading for the group of Gauteng consumers surveyed, such findings should be approached with caution, as the actual purpose, meaningful use, and comprehension of food labels, was not investigated or explained to respondents in this study.

As the current study was limited to a sample of most-likely-to-read-food-label consumers from Gauteng, further research of South African consumers is needed to determine whether the relationship between food-label reading, health awareness, and healthy lifestyle behaviour, applies to the general South African consumer. In particular, in this survey, the Gauteng consumers who expressed

concerned about their health comprised a substantial proportion of older consumers. Their position was not necessarily fostered by an interest in obtaining more information about health or nutrition, or by a concern about the potential additives and preservatives contained in certain food products. To create a better-informed consumer, guidance should be given on where to find health- and nutrition-related information. The importance of constantly revisiting these sources should be encouraged in consumer food-label reading, health and nutrition education programmes.

The study has highlighted a concern, namely the low level of exercise undertaken by the Gauteng consumers. Exercise is a key contributory factor to a healthy lifestyle, and this needs to be reinforced in consumer education initiatives. The findings point to the fact that while food labels support the efforts of consumers in achieving a healthy lifestyle, exercise should also be part of such a lifestyle, as healthy eating alone does not achieve as good a result.

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