What factors determine the use of the nutrition information on the food label when female consumers from Pietermaritzburg select and purchase fat spreads?

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Abstract

Objectives: This study set out to determine the following in relation to the nutrition information on the food labels of selected fat spreads: the demographic profile of female consumers using the food label, reasons for food label use and whether the use of the food label leads to the purchase of the selected fat spreads.

Methods: One hundred and fifty women aged 25 to 45 years were chosen using an accidental, non-probability sample of consumers shopping at selected supermarkets in Pietermaritzburg. Consenting subjects were presented with a questionnaire to determine their demographic characteristics as well as their reasons for purchasing the selected fat spreads. Descriptive statistics and principal component analyses were used to analyse the results of this study.

Results: Fifty-five per cent (n = 82) of this study sample reported using the nutrition information label to assist with their purchases and 68% (n = 102) found the nutrition information important when purchasing a new product.

Conclusions: The female consumer most likely to use the nutrition information on the food label had a tertiary education; was a primary food purchaser; lived with other people; had more money per month to spend on food; and was conscious of choosing the healthier option. Principal component analysis revealed that the purchase of a selected fat spread was influenced by a number of variables reflecting health awareness, the selected fat spread's marketing, presentation and popularity, and familiarity with and cost awareness of the selected fat spread.

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Introduction

The World Health Organization (WHO) and Food and Agricultural Organisation (FAO) state that the risk of non-communicable diseases (NCDs) may be reduced by following a "healthy" diet with an emphasis on the reduction of the intake of dietary fat, saturated fatty acids, trans fatty acids and cholesterol.[1] In South Africa, food-based dietary guidelines have been compiled to encourage an improved quality of both diet and lifestyle. One such guideline encourages the consumer to "use fat sparingly".[2] If consumers are to follow these guidelines, they need adequate information available to them to make the healthiest possible food choice. One tool that is available is the nutrition information on the food label. This nutrition information label has two important advantages as a nutrition communication tool: its location on the package of the foodstuff, and the frequency of contact that the consumer has with this nutrition information source.[3]

At the time of this study and up until July 2007, South African food labelling legislation stated that food manufacturers were only compelled to list the nutrition information if their product made a claim regarding the nutritive value.[4] For example, in the case of fat spreads, if the manufacturer claims the product is "low fat" or "lite", they would be required to list the total fat content. This implies that the majority of products on supermarket shelves, including sources of dietary fat, could have passed under this legislative "radar" because they do not make claims about their nutritive value. A limited number of studies have been conducted in South Africa regarding the use and interpretation of the nutrition information on food labels. As a result there is a shortage of current information on the use of nutrition information on food labels by South African consumers.

The following aspects were investigated in relation to the nutrition information on the food label of selected fat spreads: the demographic characteristics of female consumers using the food label; the reasons behind their use of the food label; and whether the use of this food label led to the purchase of the particular fat spread.

Methods and materials

Subjects

This study was conducted on 150 women, aged 25 to 45 years, shopping in Pietermaritzburg. The subjects were chosen as part of an accidental, non-probability sample of supermarkets/shops that sold the selected fat spreads. The selection of the subjects took place on the basis that they happened to be in the selected supermarket/shop at the time that the fieldworkers were conducting interviews. Illiterate subjects were excluded from the study.

Data collection

For the purpose of this study, the subjects were asked about "selected fat spreads", which refers to butter, margarine and a butter-margarine mix. The researchers decided to use fat spreads that could be used on bread as the focus of the questionnaire, because it was postulated that butter/margarine/butter-margarine mixes were most likely to be a significant contributor to the consumer's daily dietary intake of fat. It was also easier for the fieldworker to interview the respondents at the point where the fat spread was purchased, because these products would all be located together as opposed to being located in various aisles of the supermarkets/shops. The latter situation was found in the pilot study, which used a greater selection of products.

A comprehensive list of all supermarkets/shops in the central business district and suburban areas of Pietermaritzburg was compiled from the telephone directory. The supermarkets/shops were only included if they stocked the selected fat spreads. Fourteen of the original 22 selected supermarkets/shops gave permission for the study to be conducted on their premises. In terms of customer profile, the Living Standards Measure (LSM) of the supermarkets' target groups ranged from 8 to 10 in the suburban areas, and from 0 to 6 in the central business district. The participating supermarkets/shops were divided equally amongst the 0 to 6 and 8 to 10 ranges. The LSM of the subjects was not investigated. The shops were targeted at random times throughout the working week to ensure that women who shopped during their lunch hours/tea breaks/after work had as equal an opportunity of being selected as those women who were able to shop throughout the day.

Data was collected using a questionnaire. If the subjects were capable and willing, they completed the questionnaire on their own. Where necessary, the questionnaire was completed by the fieldworker. The first part addressed the subject's demographic characteristics, such as age and highest level of education, and the second part included factors related to the purchase of the selected fat spread, such as design and packaging, as well as familiarity with the product (see Tables I and II). Five-point Likert scales and ranked responses were used for the second part of the questionnaire. The 150 questionnaires were equally divided amongst the participating supermarkets/shops.

Table I: Home language and highest level of education of respondents

Home language (n = 150)			Highest level of education (n = 149)		
Variable	**n**	**%**	**Variable**	**n**	**%**
English	86	57.3	No schooling	2	1.3
Afrikaans	13	8.7	Grade 10 or lower	21	14.0
Indigenous	48	32.0	Matric	37	24.7
European	3	2.0	College/Certificate	26	17.3
			Technikon/Diploma	31	20.7
			University/Degree	32	21.3

Two students doing a postgraduate diploma in Dietetics who were completing their research module were used as the fieldworkers for this study. On the first day of data capturing, one supermarket from each of the 0 to 6 and 8 to 10 LSM ranges was used. The researcher supervised the interviews, discussed any problems that may have occurred and modified the questionnaire accordingly. During the interview week, the researcher visited the fieldworkers to monitor their progress and obtain feedback regarding their data collection. The researcher also supervised five of each of the fieldworker's interviews to ensure that the respondents were interviewed in a standardised manner.

Table II: Demographic characteristics of the study sample in relation to the use of the nutrition information on the food label

Demographic characteristics		Use of the nutrition information on the food label to assist the purchase of selected fat spreads						
		Does use		Does not use		Neutral[b]		Total
		n	% [a]	n	%	n	%	n
Highest education level	Secondary education	31	52.5	14	23.7	14	23.7	**59**
	Tertiary education	51	57.3	23	25.8	15	16.8	**89**
Total		82		37		29		**148**
Primary purchaser	No	8	66.7	0	0	4	33.3	**12**
	Yes	74	54.4	37	27.2	25	18.4	**136**
Total		**82**		**37**		**29**		**148**
Household members	Live alone	1	16.7	2	33.3	3	50.0	**6**
	Two	12	54.5	8	36.4	2	9.1	**22**
	Three	16	55.2	8	27.6	5	17.2	**29**
	Four	21	58.3	6	16.7	9	25.0	**36**
	Five or more	32	58.2	13	23.6	10	18.2	**55**
	Lived with one or more	81	57.0	35	24.6	26	18.3	142
Total		**82**		**37**		**29**		**148**
Money available	< R1000	27	43.5	21	33.9	14	22.6	**62**
	R1000 - R1500	22	62.8	8	22.9	5	14.3	**35**
	> R1500	33	66.0	8	16.0	9	18.0	**50**
Total		**82**		**37**		**28**		**147**

[a] Percentage of all those respondents with the same characteristic, such as tertiary education or lived with five or more people.
[b] Neutral implies that the respondent chose neither the "does use" nor "does not use" options.

Pilot study

A pilot study was conducted by two postgraduate students doing a diploma in Dietetics in 2005. Initially, a larger selection of related fat-containing food products was included. However, due to the excessive amount of time taken to complete the questionnaire, it was decided to simplify the product selection to butter, margarine and butter-margarine mixes. This resulted in the time for administering the questionnaire decreasing from 20 minutes to 10 minutes.

Ethics approval

Ethics approval was obtained from the University of KwaZulu-Natal (HSS/06034A). Written consent was obtained from the supermarket/shop manager, who gave permission for the study to take place in his/her shop, and informed consent was obtained from the participants.

Data analysis

The statistical package SPSS (version 13, SPSS Inc, Chicago IL, USA) was used to analyse the data. The subjects were presented with a five-point Likert scale for their responses to the second part of the questionnaire, but for the purpose of data analysis, the responses

were conflated into three groups: a positive response that included the "strongly agree" and "agree" responses; a neutral response; and a negative response that included the "disagree" and "strongly disagree" responses.

Principal component analysis was also used in this study. This statistical test is used to "reduce the dimensionality of a data set in which there are a large number of interrelated variables, while retaining as much as possible of the variation present in the data set".[5] Principal component analysis results in a new set of variables or principal components that do not have any correlation with the original variables. A few of these principal components will exhibit most of the variation of the original variables and this variance is represented as an Eigen value. Principal components showing a significant relationship with or variance from the original variable will have Eigen values of greater than 1.0.

Results

Demographic characteristics of the sample regarding food label use

The greatest number of respondents were from the white population group (43.3%, n = 65), followed by black (30.6%, n = 46), Indian (19.3%, n = 29) and coloured respondents (6.6%, n = 10). The mean age was 33.78 years and the median age was 33 years. The majority of the respondents had English as their home language (57%, n = 86) and had matric (25%, n = 37) (see Table I).

The demographic characteristics of the study sample in relation to the use of the nutrition information on the food label are presented in Table II. It should be noted that some subjects chose not to answer all of the questions and, as a result, the total number of responses did not add up to 150. The results showed that 62% (n = 51) of the 82 respondents that indicated using the nutrition information on the food label had some form of tertiary education. The other respondents (38%, n = 31) using the nutrition information on the food label had secondary education (matric or lower).

Ninety-two per cent (n = 136) of this sample population were the main household members responsible for food purchases and it was found that only 54% (n = 74) used the nutrition information to influence their purchases.

The findings showed an increase in label usage as the number of household members increased. Of the six respondents that lived alone, one reported using the nutrition information on the food label. The other five respondents either indicated not using it (33%, n = 2) or being neutral to its use (50%, n = 3). Interestingly, the respondents that lived in a household of four or more were more likely to use the nutrition information on the food label compared to those with smaller households. Fifty-five per cent (n = 28) of those living with one or two people reported using the label compared to 58% (n = 53) that lived in a household of four or more.

There was also a marked increase in label usage as the amount of money available for food purchases increased. About 44% of those respondents having a lower amount of money available for food purchases (less than R1 000) indicated using the nutrition information on the food label, compared to just above 60% of those with more money (more than R1 000) available per month.

Determinants related to the purchase of the selected fat spreads

Principal component analysis was used to extract 11 new principal components (Table III) from the 11 original variables (Table IV). These new principal components represent a set of derived variables influencing the purchase of fat spreads, with the components listed in order of representing the most variance from the original variables. It is important to note that these 11 principal components are not the same as the 11 original variables (Table IV). As can be seen from Table III, only three new components have Eigen values greater than 1.0 and exhibit a 59.6% cumulative variance, that is they have a significant relationship with the purchase of the selected fat spreads.

Table III: Total variance of the 11 derived principal components related to fat spread purchases

Derived principal component	Initial Eigen values				
	Total	%Variance	Cumulative %	% Variance	Cumulative %
1	**3.692**	33.559	33.559	28.978	28.978
2	**1.570**	14.274	47.834	17.177	46.155
3	**1.297**	11.787	59.620	13.465	59.620
4	0.891	8.103	67.723		
5	0.834	7.582	75.304		
6	0.704	6.401	81.706		
7	0.495	4.496	86.202		
8	0.457	4.151	90.352		
9	0.446	4.053	94.406		
10	0.320	2.905	97.310		
11	0.296	2.690	100.000		

Results that are underlined and in bold font indicate a significant relationship

Table IV: Component matrix of factor loadings of the variables related to the purchase of fat spreads

Variables relating to purchase of fat spreads	Principal components		
	1 (28% variance)	2 (17% variance)	3 (13% variance)
a) Product design and packaging	0.374	**0.521**	-0.477
b) Product advertising	0.471	**0.614**	-0.066
c) Family preference	0.342	0.216	-0.439
d) Recommended by family and friends	0.458	**0.534**	-0.066
e) Nutrition information on food label	**0.730**	-0.254	-0.121
f) Price	0.121	0.478	**0.607**
g) Health professional recommendation	**0.759**	-0.111	0.232
h) Dietary requirement	**0.766**	-0.174	0.280
i) Grew up using the product	0.339	0.170	**0.568**
j) Fat content information	**0.755**	-0.301	-0.138
k) Aim to choose the healthiest option	**0.779**	-0.368	-0.095

Results that are underlined and in bold indicate a significant association

Table IV shows the component matrix of the underlying factors influencing the purchase of fat spreads. The 11 original variables (a-k) are listed in column 1 and are compared against the three extracted principal components (Table III) that achieved an Eigen value of greater than 1. Of these possible factors, those with a factor loading of greater than plus or minus 0.5 are thought to be

significantly associated with the extracted component. It can be seen that the first significant principal component, exhibiting 28% of the variance, was related to the variables "nutrition information on food label", "health professional recommendation", "dietary requirement", "fat content information" and "aim to choose the healthiest option". These variables are all related to some form of health awareness, thereby indicating that product knowledge related to the nutritional content is a significant factor related to the purchase of a fat spread. The second significant principal component, exhibiting 17% of the variance, was significantly related to the derived variables "product design and packaging", "product advertising" and "recommended by family and friends". This implies that the marketing environment, presentation and reputation of the selected fat spread are significantly associated with its purchase. The third and last significant principal component, exhibiting 13% of the variance, was significantly related to the variables "price" and "grew up using the product". This implies that familiarity with the selected fat spread and cost awareness are also significantly related to the product's purchase. These results were used to modify Guthrie et al.'s original model of determinants of label use, as seen in Figure 1.[6] Changes to the original figure have been indicated in bold.

Determinants related to the use of the nutrition information label

When asked how important choosing the healthiest option was, 62% (n = 78) of the 126 respondents that indicated that they tried to choose the healthiest option (which would be lower in fat) also indicated using the nutrition information on the food label of the selected fat spreads to influence their purchase.

Fifty-five per cent of the study sample (n = 82) indicated using the nutrition information on the label of the selected fat spread to assist with their purchase, and 68% (n = 102) found the nutrition information important for purchasing a new product. Fifty-one per cent (n = 76) disagreed with the statement "I would rather read the nutrition label at home", in other words they would rather read the label at the point of purchase. Fifty-two per cent (n = 78) disagreed with the statement "I buy on price and not using the nutrition information on the food label".

Discussion

The purpose of this study was to determine the use of the nutrition information on the food label of selected fat spreads by female consumers aged 25 to 45 living in Pietermaritzburg. The respondents with a tertiary education were more likely to use the nutrition information on the food label compared to those with a secondary education. This result is consistent with the findings of other researchers, who have proposed that a higher education level would place the consumer at an advantage of being more informed about nutrition and therefore more able to interpret the nutrition information on the food label.[6,7]

The majority of the respondents were the main household members responsible for food purchases. While a certain proportion of these respondents could have received prior instruction or requests from other household members on what brands to purchase, this result could imply that a large proportion of these respondents wielded the most influence when deciding what product to purchase and subsequently consumed by the household members. If this is so, this result could be used effectively by both nutrition educators and the marketers of fat spreads, as it clearly defines the target range of the population most responsible for purchasing the selected fat spreads. Just over half of the respondents that were primary purchasers reported using the nutrition information on the food label. This is much lower than the findings of Alfieri and Byrd-Bredbenner, who noted that 80% of their 150 American respondents were the main household shoppers and used the nutrition information label more often.[8]

The use of the nutrition information label increased as the number of household members increased. This corresponds with the findings of Guthrie et al., who also found a marked increase in label usage as household numbers increased.[6] It has also been proposed that consumers living alone are less likely to be spending extra time

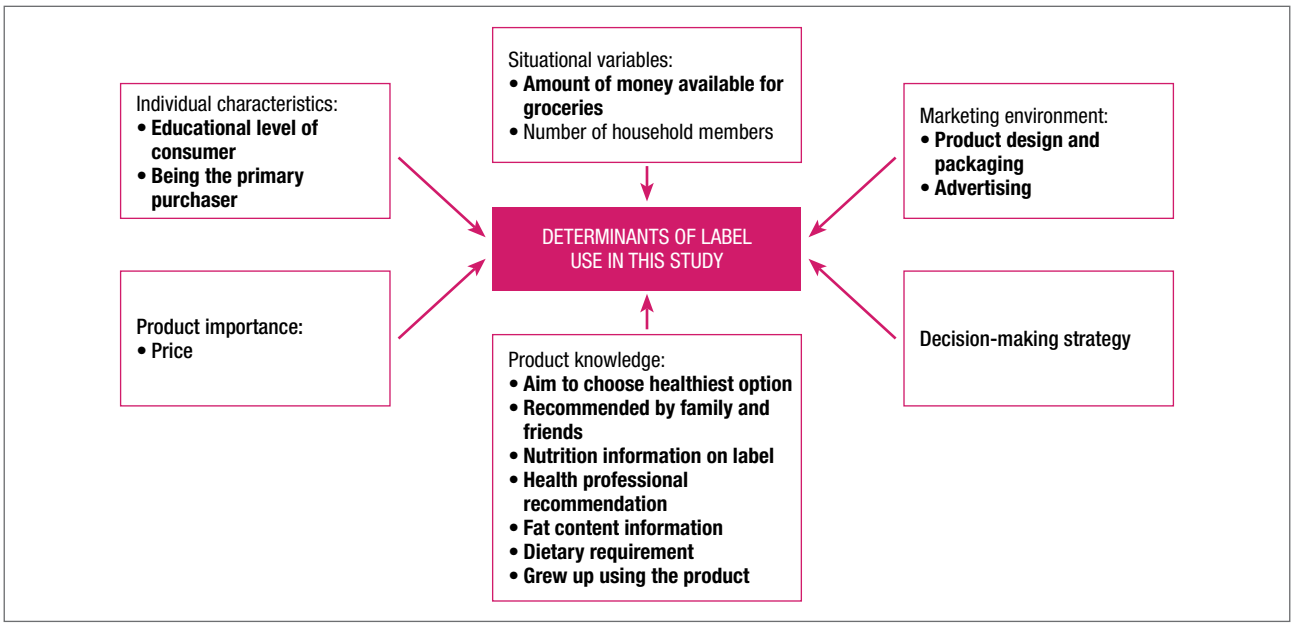

Figure 1: Modified determinants of label use according to the results of this study (after Guthrie et al[6])

and effort searching for nutrition information on a food label, in contrast to those who know that this nutrition information search has an influence on not just their own dietary intake, but that of other household members as well.[6, 7, 9]

The results from this study showed that as the amount of money available for food purchases increased, so too did label usage. This agrees with the findings of Drichoutis et al, who have shown that consumers with a higher income are thought to have the added advantage of being able to choose a greater variety of foodstuffs that are also more expensive and of a higher quality, which could mean a healthier nutritional content.[10] In terms of fat spreads, an increased amount of money available to the consumer may allow them to choose a better quality fat spread. This raises a concern for the consumers in the lower income brackets because they are more likely to purchase a fat spread based on cost and therefore do not necessarily have the luxury of being able to choose a more expensive fat spread, even though it may be a healthier choice.

Just over half of the study sample indicated using the label to assist their purchases, and around two thirds of the sample reported using the label when purchasing a new product. Anderson and Coertze found that 64.8% of their 388 female respondents read the food label when making a purchase, with 79.2% specifically using the label when buying a product for the first time.[11] However it should be noted that these researchers used a very different type of sample compared to this study and therefore one cannot make too many significant comparisons. It is suggested that because most consumers tend to repeat their menus, there is no need to keep reading the nutrition information at each shopping visit.[12]

Approximately half of this study population felt they had sufficient time to effectively use the nutrition information on the food label whilst shopping. This is slightly lower than the findings from Anderson and Coertze's South African study, where it was found that 57.8% of the respondents preferred to read the label at home.[11] Perhaps because of the ever-increasing time constraints that are placed on the female consumer at home – especially if they are looking after children – there is less time available for the consumer to peruse food labels at their own leisure. This re-emphasises the fact that consumers are most likely to spend mere seconds glancing at the food label whilst they compare products and make a purchase; therefore, it is vitally important that the consumer knows exactly what she is looking for and that the information is easy to locate and interpret.

Compared to Guthrie et al's original model of the determinants of label use,[6] this study found that there were more factors influencing the respondent's product knowledge, especially regarding health awareness, and fewer factors influencing the product's importance and situational variables.

Conclusions

The findings of this study show that the subject who is most likely to use the nutrition information on the food label has achieved a tertiary education, is a primary food purchaser, lives with other people, has a higher disposable income for food and is conscious of choosing a healthier option. The information is also most likely to be used when a fat spread is purchased for the first time. The results further indicate that, while product price and familiarity and the product's marketing environment, presentation and reputation are influential, knowledge of the product's nutritional content is more influential and the consumer is more likely to use the nutrition information to influence her purchase of a fat spread.

Recommendations

The results show that consumers are using the nutrition information on the food label at the point of purchase, most likely whilst purchasing a product for the first time. This places importance on the consumer being able to read and interpret the label both efficiently and correctly. It also implies that the brief period in which consumers pick up the product and examine the label should be as significant as possible in terms of them being able to interpret the information to make the healthier decision. If the consumer is not entirely sure what they should be looking for or what the information per serving/per 100 g implies in terms of their daily dietary fat intake, the advantage of having the nutrition information available may be lost.

According to the United Nations Children's Fund (UNICEF), 81% of the South African female population is literate.[13] If the nutrition information is to be used both correctly and effectively, there must be a major educational campaign that sets out to meet the needs of the population that is most vulnerable, namely those with a lower educational level, with less money available for groceries, and who are not using the nutrition information label.

There is a much larger scope to which this study could extend and it would be very useful to determine the use of the label on a much broader scale among a greater, more representative sample of South Africans. Other nutritional aspects besides dietary fat should be considered, using other products.

The implementation of the new labelling legislation will create an excellent opportunity for dietitians to become more involved with the food manufacturers, especially in terms of what may/may not be included on the label. If used to its full potential, in other words if all consumers are informed on how to use the label with regard to what to look for and how to apply this information, the nutrition information on the new food label will become a valuable communication tool. If this can be achieved, then the nutrition information on the food label will become essential to support adherence to the "Eat fats sparingly" food-based dietary guideline, with the ultimate goal of reducing morbidity and mortality from NCDs.

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