



CONSUMERS' KNOWLEDGE AND PERCEPTION OF FOOD LABELS: THE CASE OF TRINIDAD AND TOBAGO

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Abstract- A study was taken up to assess the knowledge and perceptions of Trinidad consumers about various components of a typical food label and the socio demographic factors that impact their knowledge level and perception. A pilot tested survey was conducted with 52 closed ended questions that measured consumers' knowledge of selected components of a typical food label, their perception about the importance of the major components of a typical food label was used to collect the data from 302 consumers over the age of 18 years residing in Trinidad. In each region of Trinidad (South, Central and North), surveys were done at the exit points of two of the physically largest supermarkets. Descriptive and Ordinary Least Square (OLS) Regression analyses were used to analyze the collected data. Results revealed the high blood pressure and diet restrictions due to religious concerns as the most important factors affecting knowledge level. The fact that elevated blood pressure levels, as well as the higher fibre intake also positively impacted perceptions, is a good sign for the population; however, males in the population need special attention as they did not fully perceive food labels as important sources of information with respect to their health.

Keywords- Consumers' knowledge; Food label; Perception; Health.

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Introduction

Food Labels list additives, ingredients and nutritional information such as fat and protein content. The world today is driven by information and due to the rise of the health conscious consumer, the demand for information about foods has also grown significantly. Food labels carry information that helps consumers to make purchasing decisions. Thus, food labels being a primary source of information from the food manufacturer, it is important that modern consumers fully understand what they are purchasing if they are to make healthy choices.

Food product labelling, as a policy tool for ensuring the provision of nutrition and health information to the consumer, has gained importance in the last decade across the globe [3]. Trends toward healthier and wellness food has also led to consumer demand for "more detailed, accurate, and accessible" nutritional information on the packaged food product [1]. Moreover, in society today, non-communicable diseases have become the number one cause of death; this has led to dramatic increases in health awareness and has hastened the search for solutions. Studies have increasingly identified a link between food label use and a healthier lifestyle. Loureiro and Nayga (2012) [4] found that persons who read food labels weigh considerably less than non-readers. This finding has motivated marketers to make greater efforts to provide more detailed and accurate information on food labels as it may impact the extent to which consumers understand and use food labels. Socio-demographic and personal health related factors that influence food labels can be used to tailor health interventions to specific population sub-groups and food marketers may also use the findings of such studies to target particular nutritional information to specific individuals [6]. Yet, in the context of emerging economies such as Trinidad and Tobago, very little information is available regarding consumers' expectations and their response to food label information [8]. Trinidad has been struggling with issues of various lifestyle diseases such as heart disease, stroke, diabetes, and cancer. According to PAHO (2012), Trinidad and Tobago has the highest prevalence, morbidity and mortality rates for such chronic non-communicable diseases in the Caribbean, and

these rates have been steadily increasing over time. Such non-communicable diseases account for over 60% of premature loss of life (death before 70 years). Thus, this study aimed to fill the knowledge gap within the food industry of Trinidad and Tobago by assessing the knowledge and perceptions of Trinidad consumers about various components of a typical food label and the socio demographic factors that impact their knowledge level and perceptions.

Materials and Methods

The target population for this study was final consumers of non-specific packaged food products. The survey instrument contained 52 closed ended questions that measured consumers' knowledge of selected components of a typical food label, their perception of the importance and use of the major components of a typical food label. Consumers' socio-demographic background was also captured. Major components of a food label assessed were; ingredients listing and instructions, health claims, (sugar free, low sodium etc), use by and best-before dates, country of origin, the nutritional panel and ethical labels (Fair Trade labels and organic certification labels etc.). Respondents' knowledge of six selected pieces of information on a food label was examined using True/False or Yes/No questions.

To assess perceptions of importance of food label components, respondents were asked how important they perceived 26 components of a typical label using a 4 point ordinal scale that ranged from not important (score=1) to very important (score=4). The questionnaire was pretested among 10 individuals matching the target's criteria. A convenient sampling technique was used to identify 302 consumers over the age of 18 years residing in Trinidad. In each region of Trinidad (South, Central and North), surveys were done at the exit points of two of the physically largest supermarkets. At each survey site, the researcher interviewed 50 individuals. Descriptive and Ordinary Least Square (OLS) Regression analyses were used to analyze the collected data. The descriptions of variables used in the OLS are shown in [Table-1]. Data were analyzed with SPSS (v 20) and results were presented in the section that follows.

Table-1 Descriptions of variables used in the Regression Analysis

Variables	Descriptions
Diabetes	1 if the respondent has diabetes; 0 otherwise (no diabetes)
High Blood Pressure	1 if the respondent has high blood pressure; 0 otherwise (no high blood pressure)
High Cholesterol	1 if the respondent has high cholesterol; 0 otherwise (no high cholesterol)
Athletics	1 if the respondent's diet is influenced by athletics; 0 otherwise (no athletic dietary needs)
Religiousness	1 if the respondent has religious dietary restrictions; 0 otherwise (no religious dietary restrictions)
Allergies	1 if the respondent has dietary restrictions due to allergies; 0 otherwise (no allergies)
Rural/Urban	1 if the respondent is from an urban area; 0 otherwise (rural)
Male	1 if the respondent is male; 0 otherwise (female)
Age	Age bracket of the respondent. Response ranges from 1 to 6, where 1= 14 - 20 years; 2=21 - 35 years; 3=36 - 50 years; 4=51 - 70 years; 5=71 - 85 years; and 6= Over 86 years old
Ethnicity – Indian*	1 if the respondent is of Indian descent; 0 otherwise
Ethnicity – Mixed*	1 if the respondent is of mixed decent; 0 otherwise
Ethnicity – Caucasian*	1 if the respondent is of Caucasian descent; 0 otherwise
Ethnicity – Others*	1 if the respondent is some other Ethnicity (not listed and also non-African); 0 otherwise
Level of Schooling	Level of schooling of the respondent. Response ranges from 1 to 4, where 1=none and 4=tertiary
Level of Income (1TT\$ = 6.4 USD in 2015)	Monthly income range selected by the respondent. Response ranges from 1 to 6, where 1= \$0 - \$2999; 2=\$3000- \$5999; 3=\$6000 - \$8999; 4=\$9000 - \$11999; 5=\$12000 - \$14999; 6=Over \$15000
Trust In Food Label Info.	Rating of trust on the accuracy of food label information. Response ranges from 1 to 4, where 4= trusted very much and 1= not trust
Brand Name Importance	Rating of importance of the brand name to respondent. Response ranges from 1 to 4, where 4=very important and 1=not important at all
Exercise	Number of hours of exercise per week performed by the respondent
BMI	Body mass index of the respondent (respondent weight in pounds multiplied by 703 divided by respondent height squared)
Fast Food Consumption	Number of times per week that the respondent eats fast food
Water Consumption	Amount of water, respondent drinks per day. Response ranges from 0 to 4; where 1= 0-3 Glasses; 2=4-7 Glasses; 3=8-11 Glasses; 4=Over 12 Glasses; and 0= I don't count
Fiber Consumption	Amount of fiber, respondent consumes per day. Response ranges from 0 to 4, where 1= 0-8 grams; 2=9-16 grams; 3=17-24 grams; 4=Over 25 grams and 0= I don't know.

* Reference Category – African Ethnicity

Results and Discussion

Socio-demographic Composition of Sample

Results indicated that majority (60%) of the respondents were females, most lived in peri-urban/ rural areas (82%) of Trinidad, besides most (59%) of them having attained tertiary level education [Table-2]. Among the respondents, most were between the age of 21 to 35 (39%) and 36 to 50 (30%) of the sample of respondents, 59% were mixed ethnicity. With respect to monthly income, most respondents earned between TT\$6,000 and TT\$11,999 (48%), an indication of a middle-income background based on Trinidad standards. More than half of the sample (52%) was classified as overweight and obese based on their calculated Body Mass Index (BMI).

Knowledge of Food Label Components

Respondents' knowledge on food label information was examined over six True/False and Yes/No questions [Table-2]. Overall results showed that a majority (54%) of consumers answered the questions incorrectly while only 46% answered correctly. Most consumers (58%) answered correctly for the question: "Is there a difference between the use by and best before date?", while a majority of the sample (62%) answered incorrectly for the question: "How many grams are there in a teaspoon?" and 59% did not know the difference between salt and sodium.

Table-2 The Distribution of Correct versus Incorrect Knowledge of Food Label information

Rank	Questions	Outcome	Frequencies (%)
1	Is there a difference between the use by and best before date?	Correct	58
		Incorrect	42
2	Is there a difference between calories and energy?	Correct	56
		Incorrect	44
3	Is there a difference between organic and natural?	Correct	55
		Incorrect	45
4	Did you know that ingredients are listed in descending order by weight?	Correct	29
		Incorrect	71
5	Is there a difference between salt and sodium?	Correct	41
		Incorrect	59
6	How many grams are there in a teaspoon?	Correct	38
		Incorrect	62
Overall Mean		Correct	46
		Incorrect	54

Perception of Importance of Food Label Components

Respondents were asked how important they perceived about the 26 components of a typical label using a 4 point ordinal scale that ranged from not important (score=1) to very important (score=4). Responses were ranked based on the distribution of descriptive frequencies and the results are presented in [Table-3]. As per the response of consumers, Use by date, Ingredients listing, Sugar content, Total fat, Cholesterol content and Calorie content were ascertained to be the most important information of a typical food label components. Respondents did ascribe more importance to the components such as vitamin and sodium contents, preparation instructions and fibre content. On the other hand, Organic Certification, Calorie Free, Monounsaturated fat, Country of Origin and Fair Trade were regarded as the least important information on a food label.

Ordinary Least Squares regression analysis was used to assess the relationships between overall understanding of food label related information (scores) and the demographic and health factors. The model showed a good fit with an adjusted R² of 0.671(67.1%).

Of the explanatory variables included in the model, six variables, (i) high blood pressure; (ii) religious dietary restrictions; (iii) level of income; (iv) trust in food labels; (v) brand name importance and (vi) exercise had significant impact on the knowledge scores of food labels information. The results indicated that the consumers with high blood pressure had a significant sound knowledge on food labels compared those with normal blood pressure. Notably, the consumers those followed diet restrictions on religious ground had significantly lower levels of understanding of food label related information. Contrastingly, the level of income of consumers had significant positive effect on the knowledge of food label information, that is, the understanding of the food label information raised as level of income increased from the mean level. However, the trust in food label information increased, when there was a decrease in understanding of food label information, while the perception of importance of brand names increased understanding related to food label information increased. Uniquely, exercise had a positive effect on the knowledge level of food label, as the number of hours of exercise increased the understanding of food label related information also increased on average.

The results showed that two dietary restrictions, high blood pressure and religious diet restrictions, influenced on the amount of understanding of consumers had of food label information. Consumers who followed religious diet restrictions showed less understanding of food label information, which should be incorporated in

Table-3 The Perception of Importance of Food Label Components

Rank	Variables	Not Important (%)	Somewhat Unimportant (%)	Important (%)	Very Important (%)	Mean (±SD)
1	Use -by Date	1	3	17	78	3.73 (.635)
2	Ingredients Listing	0	7	38	55	3.48 (.640)
3	Sugar Content	2	11	38	49	3.35 (.740)
4	Total Fat	2	12	39	48	3.32 (.803)
5	Cholesterol Content	3	11	39	47	3.30 (.772)
6	Calorie Content	3	11	41	45	3.27 (.789)
7	Vitamin Content	2	12	45	41	3.25 (.748)
8	Sodium Content	2	14	41	43	3.24 (.776)
9	Preparation Instructions	4	12	43	42	3.22 (.803)
10	High Fiber	2	16	42	40	3.20 (.776)
11	Saturated Fat	4	17	37	43	3.19 (.841)
12	All Natural	4	17	36	42	3.17 (.862)
13	GMO	4	19	32	44	3.17 (.885)
14	Trans Fat	5	18	33	44	3.16 (.892)
15	Fiber Content	3	16	45	37	3.15 (.778)
16	Low Sodium	4	16	40	39	3.15 (.883)
17	Sugar Free	6	18	36	40	3.11 (.896)
18	Zero Trans Fat	5	18	37	39	3.11 (.881)
19	Multigrain	5	22	39	34	3.08 (.864)
20	Organic Certification	4	23	35	38	3.07 (.882)
21	Fat Free	7	17	41	35	3.04 (.892)
22	Polyunsaturated fat	6	21	37	36	3.04 (.889)
23	Calorie Free	7	21	38	34	3.00 (.991)
24	Monounsaturated fat	8	21	35	36	3.00 (.945)
25	Country of Origin	8	24	30	38	2.97 (.974)
26	Fair Trade	15	28	33	24	2.67 (1.00)
Mean (%)		5	16	37	42	

Factors impacting Knowledge: Regression Analysis

further studies to draw justifiable explanations for this outcome. Moreover, as the levels of income increased, the understanding of food label information also increased. From a marketing perspective, this shows that higher income consumers may be more interested in detailed food label information and targeting that segment with such information may provide a competitive advantage.

Trinidadian consumers that exercised more often also showed better understanding of food label information. This is to be expected, however, the provision of detailed and accurate nutrition information by marketers may lead to greater customer loyalty by this type of consumer.

Table-4 Results of Ordinary Least Squares Regression analyses

Explanatory Variables	Dependent Variable: Knowledge of Food Label Information			Dependent Variable: Perception toward Food Labels		
	Coefficient	SE	P-value	Coefficient	SE	P-value
Constant	1.73	0.93	0.06	81.26	8.58	0.00001***
Diabetes	-0.39	0.31	0.21	4.28	2.84	0.13
High Blood Pressure	0.65	0.16	0.01***	4.68	1.89	0.05**
High Cholesterol	-0.14	0.28	0.62	1.40	2.63	0.59
Athlete	0.14	0.32	0.66	4.52	2.95	0.13
Religion	-0.71	0.24	0.04**	1.73	3.10	0.58
Allergic	0.15	0.22	0.50	1.25	2.07	0.55
Gender-Male	-0.03	0.19	0.89	-4.68	1.77	0.01***
Urban/ Rural	-0.24	0.25	0.35	1.68	2.32	0.47
Age	-0.18	0.12	0.13	0.03	1.13	0.98
Ethnicity – Indian [#]	0.18	0.26	0.51	0.74	2.43	0.76
Ethnicity – Mixed [#]	0.04	0.63	0.95	-8.71	5.78	0.13
Ethnicity – Caucasian [#]	0.32	0.23	0.16	-1.67	2.09	0.42
Ethnicity – Others [#]	-0.03	0.67	0.96	-4.25	6.19	0.49
Level of School	0.15	0.18	0.40	2.16	1.64	0.19
Level of Income	0.19	0.08	0.01***	-1.08	0.70	0.13
Trust of Food Labels	-0.23	0.13	0.075*	-0.38	1.19	0.75
Brand Importance	0.29	0.06	0.01***	1.64	1.03	0.11
Exercise	0.06	0.01	0.04**	-0.09	0.25	0.72
BMI	-0.01	0.02	0.45	0.03	0.17	0.85
Fast Food Consumption	0.03	0.07	0.63	-1.41	0.61	0.02**
Water Consumption	0.04	0.13	0.75	-1.93	1.23	0.12
Fiber Consumption	0.03	0.07	0.64	2.45	0.67	0.003***
Adjusted R ² = 0.671; F(22, 277): P-value(F) =0.003			Adjusted R ² = 0.626; F(22, 277): P-value(F) =0.000095			

- Reference category: African Ethnicity; *p ≤ 0.10, **p ≤ 0.05, ***p ≤ 0.01

Perception on the Importance of Food Labels: Regression Analysis

An Ordinary Least Squares regression analysis (OLS) was used to determine the linear relationship between the importance consumers ascribed to food labels and demographic and health factors. The ranking of overall food label importance was generated by ranking of respondents of various components of food label. With respect to importance, each component being ranked between one and four. A total score was calculated for each respondent that ranged between 28 and 144 which was used to ascertain their perception of importance toward food labels. As shown in [Table-4] the adjusted R^2 was 0.626 suggesting that, 62.6% of the variation in the dependent variable was explained by the independent variables.

Among the explanatory variables included in the analysis, four variables, viz., (i) high blood pressure; (ii) gender; (iii) fast food consumption; and (iv) dietary fiber consumption had significantly impacted perceptions on the importance of the food label. Results of analysis exhibited that the consumers with high blood pressure had attached significantly more importance towards food label information compared those with normal blood pressure. Notably, the gender analysis also showed that, male consumers are the males to be less skewed towards food label information. The respondents who consumed fast food frequently had only significant negative perception on the importance of food labels vis-à-vis to those consuming occasionally. However, as the amount of fiber consumption increased by the consumer respondents, their perception on food label information increased significantly on an average.

In previous studies, 'Special Diet Status' had been shown to have consistent positive relationships with food label usage; consumers aware of their diet-health or diet-disease relation were more likely to use on-pack nutrition information [2]. This study went a step further and broke down the category into a list of common dietary restrictions from which the respondents made selections. High blood pressure being one of the options that had a significant positive relationship; as people with high blood pressure were more likely to have positive perception of importance toward food label information. This indicates that Trinidadian consumers with high blood pressure would perceive food label information as important as they attempt to keep their condition under control. This is to be expected, as one in four adults in Trinidad and Tobago live with high blood pressure [5] (Ministry of Health 2011). Furthermore, similar to a study by Drichoutis, Lazaridis and Nayga (2006) [2], females showed more favorable perception toward food labels than males. An independent variable unique to this study was the influence of fast food consumption by Trinidadian consumers. This variable was shown to be significant, as the consumption of fast food, increased consumers had a less positive perception toward food label information. This is to be expected as people who eat more fast food typically have less concern for their health. This finding was similar to a study by Yen (2012) [9], which showed that the smoking population paid much less attention to food label information. According to the study, the less healthy habits of the consumers surveyed may have translated to less concern about the nutritional content of the food they ate Yen (2012) [9]. On the other hand, as daily consumption of fiber increased there was an increasingly positive perception toward food label information by Trinidadian consumers. This further reinforces the overall inference that a positive perception toward food labels is correlated with a healthy lifestyle.

Conclusion

Trinidad consumers have what could best be described as moderate overall knowledge of food label information. High blood pressure and diet restrictions due to religiousness were the most important factors impacting knowledge. Elevated blood pressure levels is a major factor in the health of the Trinidad population and this finding suggests that the population is starting to pay some attention to food labels and hopefully this will impact in lowered blood pressure levels in the nation. The fact that elevated blood pressure levels, as well as those persons who have higher fibre intake also positively impacted perceptions, is a good sign for the population; however, males in the population need special attention, as they did not fully perceive food labels as important sources of information with respect to their health. Neither did those who consumed fast foods. There is much work to be done in the area of public education. Starting at the school level would be a good strategy to help provide accurate health information as well as to shape more

positive perceptions of the benefits of being able to understand food label information. The government of Trinidad and Tobago, through its Consumers' Affairs division has a role to play in ensuring that manufactures provide food label information in a manner that is readable and easily understood. This will serve to encourage more persons to read and understand food labels.

Conflict of Interest: None declared

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