

FACTORS ASSOCIATED WITH CONSUMERS' AWARENESS AND USE OF INFORMATION ON FOOD LABELS

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Abstract

This study attempts to evaluate the consumers' level of awareness and use of information provided on food labels. Three distinct consumer groups based on use of and level of importance assigned to various information printed on food labels were identified through two-step cluster analysis as: high level of use and high level of importance assigned (40.1%), low level of use but high level of importance assigned (35%) and low level of use and low level of importance assigned (24.9%). Multinomial logistic regression procedure was used to investigate the influence of individual characteristics on consumers' awareness and use of information.

Keywords: food, food labeling, cluster analysis, multinomial logistic regression

1. INTRODUCTION

Food labeling is aimed at providing a sort of "identity card" of the product, so as to make information immediately accessible to consumers making purchasing decisions [1]. Particularly, it is a tool through which consumers are provided with a whole set of data such as price, date of expiry, ingredient list, country of origin, food additives and more over. This study attempts to evaluate the consumers' level of awareness and use of information provided on food labels and its relationship with individual characteristics.

Knowing the baseline knowledge and behavior of consumers is essential for the development of effective nutrition and health education programs. Further, label is the primary point of contact between the producer and the purchaser and should be thought of an integral part of the producer's marketing plan. By better understanding consumers' awareness and concern about information on food labels, manufacturers can market their product to meet the needs of health conscious consumers.

It is important to draw attention to some limitations associated with the study. Due to the nature of the survey we conducted these results can be generalize to the population of urban areas. Ideally however future research should test the robustness of these results on semi-urban and rural population and see if there are urbanization effects. There is much larger scope to which this study could extend and it would be very useful to determine the use of nutrition information on a much broader scale among greater, more representative sample of Sri Lanka.

2. METODOLOGY

Survey: This is a cross sectional study done over a period of five months at supermarkets, retail shops of various sizes in five towns in Colombo District. The geographical locations of the supermarkets, retail shops were chosen with the aim of having the maximum geographical scattering possible and also the maximum socio-economic scattering of consumers' characteristics. Participants were selected based on systematic sampling.

Data was collected using a structured, interviewer administered questionnaire. Respondents were limited to individuals age 18 and over. A total of 600 individuals participated in the survey. With the deletion of respondents with incomplete information on the variables used in the study, the final sample used contains 586 respondents.

Questionnaire: The first part of the questionnaire was aimed at assessing demographic and socio-economic characteristics of the consumer. The questions included in the second section of the

questionnaire were aimed at assessing how consumers use different types of information printed on food labels and identifying which information are viewed as more important. Respondents were asked to report how often they use 18 information cues that appear on the product label for food. These were: product name, brand name, manufacture date, date of packing, expiry date, price, net quantity, country of origin, ingredient list, food additives, name/address manufacturer, direction for use/storage, quality certificate/quality seal/ SLS, warning statement, health/ nutrition claims, information about allergens, nutrition panel and trade mark. Use of these cues was measured on a 5-point Likert scale ranging from “never (1)” to “always (5)”. The response categories are, “Always (5)”, “Most of the time (4)”, “Sometimes (3)”, “Rarely (2)”, “Never (1)”. In order to measure the consumers’ awareness, respondents were asked to assign the level of importance they attach to each of the eighteen categories of information generally displayed on the food labels. The response categories are; “very important (5)”, “important (4)”, “moderately important (3)”, “of little important (2)” and “unimportant (1)”.

Statistical Analysis: Two-Step Cluster Analysis using Schwartz’s Bayesian Criterion(BIC) and Akaike’s Information Criterion(AIC) in the Statistical Package for Social Sciences (SPSS 16.0) was used to identify clusters of respondents based on consumers’ use of and level of importance attached to different types of information displayed on food labels while purchase of package food items. Demographic variables and Socio – economic characteristics were omitted from the cluster analysis, so that cluster membership was driven by respondents purchasing behavior rather than individual characteristics. Multinomial logistic regression analysis was used to estimate the effect of demographic, socio-economic and health related factors on cluster membership.

3. RESULTS AND DISCUSSION

With respect to the socio - demographic features the survey highlighted that majority of the respondents were predominantly women with only 26 percent as males. Nearly 37% of the respondents had a degree or above while twenty-five percent of respondents had a diploma. Individuals who terminated their education at primary level appeared to be under represented in the sample when compared to the actual population. The sample was therefore somewhat biased in terms of generalizing the results to the Sri Lankan population. Respondents were generally middle aged. More than 30% of the respondents employed full time. The modal income category was Rs. 35000 – Rs 49999. Nearly 70% of the respondents reported children in the household 18 years or less. Approximately 5% of the respondents reported children in the household under the age of one year. 74% of the sample was married; whereas the remaining proportion was single, separated/ divorced or widowed. Just over one-fourth (26%) of the respondents reported having the primary responsibility for food preparation. Nearly 47% of respondents reported buying packaged food from retail shops, while just over a third (~35%) reported buying packaged food from super markets. 17% of the respondents stated buying packaged food from retail shops and super markets both equally.

Cluster Analysis: Two – step cluster analysis identified three clusters of respondents based on consumers’ use of and level of importance attached to different types of information displayed on food labels while purchase of packaged food items. The profile of each cluster in terms of median ratings of clusters on the classification table is presented in Table 2. The a-c indicates significantly different medians. Kruskal Walls, Pair-Wise Comparison test has been applied to assess significant differences across clusters.

To assess predictive validity we focused on variables not used to form the clusters but known to vary across the clusters. It is known from past research consumers’ perceptions towards food label information vary by consumers’ awareness and use of food label information [2][3]. For this purpose, following five outcome measures were considered: Useful - The information on food label is useful to me, Easiness - It is easy to understand the information on food labels, Sufficient - Information provided in food label is sufficient, Confidence - I believe the information provided on food label is true, Clear- The information printed on food label is clear. Consumers’ perceptions on above statements were measured on a 5-point likert scale ranging from “never” to “always”. The response categories were given in the following five levels: Always (i = 5), Most of the time (i = 4),

Sometimes(i = 3) , Rarely(i = 2), Never(i =1). Each outcome measure is then examined for differences across the clusters in the three-cluster solution.

Table 1: Assessing Criterion Validity for Two-Step Clustering Solution

Variable	Cluster 01 High use & high importance	Cluster 02 Low use and high importance	Cluster 03 Low use and low importance	Kruskal-Wallis statistic (p-value)
	Median			
Useful	4 ^a	3 ^b	2 ^c	412.58 (0.000)
Easiness	5 ^a	3 ^b	2 ^c	337.73 (0.000)
Sufficient	3 ^a	3 ^b	4 ^c	60.51 (0.000)
Confidence	4 ^a	3 ^b	2 ^c	352.15 (0.000)
Clarity	4 ^a	3 ^b	2 ^c	35.99 (0.000)

The a-c indicates significantly different medians. Kruskal Walls, Pair-Wise Comparison test has been applied to assess significant differences across clusters. For the three cluster solution, the Kruskal Walls test shows that the clusters medians are significantly different across all five outcome variables. Since significant differences do exist on these variables, we conclude that the clusters do depict groups that have predictive validity.

Cluster 1 is the biggest (40.1%) and the least differentiated in terms of use of and level of importance attached to different information cues. Median rating for the use of ingredient list, food additives, quality certificate, health claims, allergens, nutritional panel and trade mark is higher than the other two clusters; cluster 02 and cluster 03. Individuals belonging to this group scored the highest on the use of all the information cues except date of packing and showed a high level of importance. Simply they were very involved in information search printed in food labels. Additionally, they displayed a high level of importance in almost all information cues. Therefore, they might be called as “High use and High importance” in short “High, High”.

Cluster 2 accounts for 35% of the sample. Individuals belonging to this segment did not actively search information food labels. They were rather “passive” in information search printed in food labels (low score on use of most of the information). However, they assigned a high level of importance in almost all information sources except trade mark. Therefore, individuals belonging to this consumer group might be called as “Low use and High importance” in short “Low, High”.

Cluster 3 is the smallest consumer segment accounting for 24.9% of the sample. Respondents from this segment displayed low use of information and low level of importance. Their usage level and level of importance assigned was lowest among the three groups. They seemed to be very distrustful, insecure about information in food labels in general. Individuals belonging to this group did not assign a high importance and did not use any particular information more in comparison with other two clusters. Therefore, they might be called as “Low use and Low importance” in short “Low, Low”.

Females were 6.6 times more likely to be in cluster 1 than males. Consumers who buy package food from retail shops were 0.5 times less likely to be in cluster 1 than the consumers who buy package food from supermarkets. Also the odds of education level implies that the likelihood of being in the category “high use and high importance” increase with the improvement of highest level of education. The odds of being in cluster 1 among respondents who rate the “perceived importance of familiarity with the product when buying packaged food” as little important are 117 times larger than the odds among respondents who rate the above expression as very important. Retail shoppers were 1.01 times more likely to be in cluster 2 than super market shoppers. Higher income, retired, those who are having metabolic syndrome were more likely to be in cluster 2. Lower income, lower educated individuals were more likely to be in cluster 03.

Table 2: Median rating of clusters on the classification variable

	Consumer segments			Kruskal - Wallis statistic	p-value
	Cluster 01	Cluster 02	Cluster 03		
Size (% of the sample)	235 (40.1)	205 (35)	146 (24.9)		
Use of Information					
Product name	5 ^a	4 ^b	3 ^c	114.20	0.000
Brand name	4 ^a	3 ^b	2 ^c	89.10	0.000
Manufacture Date	5 ^a	2 ^b	2 ^b	178.56	0.000
Date of packing	2 ^a	2 ^a	2 ^a	10.22	0.006
Expiry Date	5 ^a	4 ^b	2 ^c	193.97	0.000
Price	5 ^a	4 ^b	3 ^c	143.00	0.000
Net quantity	3 ^a	2 ^b	2 ^b	36.32	0.000
Country of origin	4 ^a	2 ^b	2 ^b	263.34	0.000
Ingredient list	5 ^a	2 ^b	2 ^b	195.66	0.000
Food additives	5 ^a	2 ^b	2 ^c	273.57	0.000
Manufacturer	3 ^a	2 ^b	2 ^c	90.20	0.000
Direction for use/storage	3 ^a	2 ^b	2 ^c	90.20	0.000
Quality certificate	5 ^a	2 ^b	2 ^c	349.91	0.000
Warning statement	4 ^a	2 ^b	2 ^c	294.88	0.000
Health claims	5 ^a	3 ^b	2 ^c	104.07	0.000
Allergens	5 ^a	2 ^b	2 ^c	310.57	0.000
Nutrition panel	5 ^a	2 ^b	2 ^c	256.44	0.000
Trade mark	5 ^a	2 ^b	2 ^b	276.37	0.000
Importance					
Product name	5 ^a	5 ^a	4 ^b	95.36	0.000
Brand name	4 ^a	4 ^a	3 ^b	44.10	0.000
Manufacture Date	5 ^a	5 ^a	2 ^b	188.58	0.000
Date of packing	4 ^a	4 ^a	2 ^b	48.21	0.000
Expiry Date	5 ^a	5 ^a	3 ^b	244.51	0.000
Price	5 ^a	5 ^a	4 ^b	121.80	0.000
Net quantity	4 ^a	4 ^b	2 ^c	86.29	0.000
Country of origin	5 ^a	5 ^a	2 ^b	254.87	0.000
Ingredient list	5 ^a	5 ^a	2 ^b	225.61	0.000
Food additives	5 ^a	5 ^a	2 ^b	271.93	0.000
Manufacturer	4 ^a	4 ^a	2 ^b	112.52	0.000
Direction for use/storage	4 ^a	4 ^a	2 ^b	132.72	0.000
Quality certificate	5 ^a	5 ^a	2 ^b	317.02	0.000
Warning statement	4 ^a	4 ^a	2 ^b	223.63	0.000
Health claims	5 ^a	5 ^a	3 ^b	123.44	0.000
Allergens	5 ^a	5 ^a	2 ^b	290.97	0.000
Nutrition panel	5 ^a	5 ^a	2 ^b	249.24	0.000
Trade mark	5 ^a	3 ^b	2 ^c	204.18	0.000
Key Characteristic	High use & high importance	Low use & high importance	Low use & low importance		

Compared to cluster 3 respondents in cluster 1 were more likely to have special dietary requirements such as breastfeeding, pregnancy, training for sports or vegetarian. Majority of the people i.e. 54.6% always check the expiry date in the food item they are purchasing while 53% always check price. Only 10% never check price while 14% never check expiry date. Health/ Nutrition Claims and product name of the food are other attributes in order of level of use by the respondents. These results

indicate that even though majority of respondents considered Quality certificate/ SLS, Information about allergens, Nutrition panel, Food additives as ‘very important’ usage of such information as one of the criteria while purchasing packaged food product is relatively low. Majority of respondents in the sample stated that they never look nutritional panel printed on food labels. Approximately a fifth (22%) always checks country of origin when buying packaged food items. Of the eighteen information provided on food labels, information about manufacturer, net quantity, direction for use/ storage get least attention from the respondents.

Association between cluster membership of the consumer and marketing methods were tested by using chi-squared test. Majority of respondents in the sample influenced a lot by the marketing tricks used by the manufacturers such as attractive packages, health and nutrition claims, graphical and pictorial information and free/prizes/contests when buying package food and there is a significant association between cluster membership and how concerned consumer is to attractive packages ($p=0.002$), graphical and pictorial information (0.000), and free/ prizes/ contests ($p = 0.002$).

Consumers’ ability to interpret nutrition contentment claims on food labels was also tested. More than half of respondents in “high use and high importance” (60.43%) and “low use and high importance” (56.10%) correctly interpret the meaning of the “Net quantity”. Nearly half (~ 47%) of the respondents in the “low use and low importance” reported the correct answer for the “Net quantity” while approximately 43% of respondents in the “low use and low importance” stated “do not know”. Nearly one –third (30.24%) in the “low use and low importance” indicated they do not know the correct interpretation of the net quantity. Approximately one in ten respondents (~10%) in all clusters gave incorrect interpretation for the net quantity. Majority of respondents in each cluster under estimated the quantity of the fat content expressed by the claim “low in fat” while nearly one –third in each cluster over estimated the quantity of fat indicated by the claim. Only very few (6%) correctly interpreted the “low in fat” claim. More than one forth (28%) in cluster “high use and high importance” reported the correct interpretation and just over one fifth (22%) in cluster “low use and high importance” and one fifth (20%) in “low use and low importance” gave the correct interpretation of the claim “low in cholesterol.” The interpretation given to the claim “sodium free” was more satisfactory. Also this survey highlighted a low level of familiarity with the E-code labels in “low use and high importance category” and “low use and low importance category.”

4. CONCLUSIONS

The results indicates satisfactory level of awareness about different types of information on food labels but usage of such information as one of the criteria while purchasing packaged food product is relatively low. The results of multinomial regression analysis reveals gender, highest level of education, marital status, children in the household, employment status, household income major food shopper of the household, age, psychological factors such as familiarity with the product and health related factors such as having diabetes, metabolic syndrome, frequency of do exercise and self perception of overall health have significant effect on the cluster membership. These outcomes are helpful for policy makers as well as food companies in designing appropriate strategies for improving awareness among consumers and ensuring that their usability is improved.

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