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Effect of Socio-demographic characteristics on usage and non usage of food labels during purchase of packaged food In India

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Abstract: *The study aims at identifying effect of socio-demographic characteristics of customers on usage and non usage of food labels during purchase of packaged food, study is conducted through primary survey of 474 respondents using structured questionnaire. The data was analysed using Statistical Package for Social Sciences. Six factors which effect usage of food labels and seven non usage factors are identified by reviewing previous studies. Analysis is being carried out using statistical techniques. Linear regression equation was developed which shows that the level of education has the highest influence over identified usage factors, p value also justify the statement. Among non usage factors gender, marital status and level of education has influence over identified factors. The suggestions derived in the present study hold important implications for government agencies and provide key design inputs for labels to food processors, retailers and food packagers.*
Background*: Food labelling act as an instrument to encourage and shield public health by providing accurate information about nutritional information so that consumers can make informed dietary choices, while others observe it as a tool of marketing and product promotion. When consumers have relevant information, they are empowered to make informed choices. Therefore, access to nutrition information at the point of sales may empower customer decisions regarding food selection, and lead to higher satisfaction and product ratings.*
Materials and Methods*: Primary survey has been employed through structured questionnaire method, to study various dimensions of consumer buying behavior. In this study, all Indian consumers are universe; National Capital Region is chosen as an area of study.*
Results*: Logistic regression model was developed to predict the likelihood or probability of impact of identified usage factors on food label usage at the time of food purchase by consumers. A logistic regression model is a form of regression where the outcome variable is binary or dichotomous, and the independents are continuous variables, categorical variables or both.*
Conclusion: *Every food label should contain information on product price, manufacturing date along with the best before and expiry dates, name and address of the product manufacturer, Warning / instruction about health risk, Ethical information and information on nutritional contents for better management of health risk. The government needs to draw the attention of food industries to the permitted size of the font that maybe used on food label and to ensure endorsement of the food labelling regulations.*
Key Word*: Food label, Socio-Demographic, Packaged food, Purchase.*

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I. Introduction

Food label can decrease the information problem between producers and consumers, while also reducing search costs for consumers for healthier food product.

Most of the people consider labelling and packaging as a same phenomenon, but there is a difference between them. Packaging is the science and art of shielding products for the purpose of distribution. It is also for the designing process, evaluating and producing of the packaged items. Packaging may be divided in three types: primary, secondary and tertiary. Labelling is either written, electronic, or graphical communications on the packet. The objectives of labelling are brand identification, providing the information and promotion. Label on the food products are proposed for consumer information. It also helps in selling the product and choices of food items. It is the sole accountability of the firms for the healthiness and protection of consumers. Misleading information might be the causes for human diseases. These may also be occasionally leads to casualty due to misleading information.

There are both opportunities and challenges for food processors, importers, food packagers, and labellers to respond to consumers' requirements due to the growing market for packaged food. Therefore, improvement in food product development, packaging, and labelling are becoming means for survival across the world. Therefore, product packaging and labelling have abundant vital function to play in the rising market environment.

Approval of labelling should be given after considering several factors. name of country in which product is originated, ingredients list, batch code of the manufactured product, manufacturing date, best before date, net weight and address of producer are important to mention. It is important for the food processing company and legal authority for the consumer safety.

II. Literature Review

The phrase "You are what you eat" is literally true. Eating is considered as one of the most important parts of our everyday living. Without which we can't expect the life to exist. The foods we eat are the single source of energy and nutrition. Food contains a variety of nutrients which are essential for our body to function effectively. Nutrients are required to perform a particular role(s) in the body including growth and repair, heat and energy and protection from disease. It is important that the food we eat provides a combination of nutrients.

Changing needs and lifestyle, the link between diet and disease, dietary guidelines and media attention have stimulated interest in nutrition as elaborated by Richardson (1990). Trends in society have an influential effect on consumer choice and demand. Healthy living is a term frequently used, with the benefits of exercise, a healthy diet, reduction of alcohol and stress management continuously stressed by experts in the fields of nutrition and medicine. Life expectancy has increased and people want to lead an active and healthy lifestyle in the latter part of their lives.

According To Wahlich et al. (2013), the importance of nutritional information disclosure on food label is unavoidable, it is found as the most important part. The consumers are helped in maintaining the quality of routine dietary, once the nutritional information on food label is being placed. MOH (2008) explained that China published its 1st Food Nutritional Label Regulation in 2008 after considering the importance of the nutritional information on food label.Grunert et al. (2010) found that large number of the researcher's described that the understanding about nutritional food labelling information by the customers is the key point for the success of food products.

According to The International Food Information Council (2011), the shortage of understanding of information given on food label may develop a negative behaviour among consumers; this finally leads to avoidance of food label as well as nutritional information given on food label by consumers. The carefulness of consumer has been increased over the period of time. Wardle et al. (2004) conducted a survey about 64% of American adults and found that they were more eager in searching healthy and nutritional foods in the market. This type of behaviour has predisposed consumer's selection of packaged food and beverage. It is also studied that, the consciousness of healthiness differs among gender. It has been reported that women are much careful in avoiding high fat than men. They also tilted about the healthy eating behaviour than men. Changing regular behaviour of human towards any new search is difficult. The rationale behind this complexity is the strong establishment of any right or wrong perception held towards performing any habitual behaviour from human. Therefore, perception towards healthy behaviour is affected by many factors; familiarity factor may be one of them among several identified factors. Priven et al. (2015)

Dean et al. (2012) found that personal relevance with food product label is directly related with the perceived benefits that consumers are expected to get in future linked with food items and a feeling of healthfulness. Consumer's sensitivity about the basic outcome of food on health instigates consumer to keep away from unhealthy food and increase the interest in searching healthy food and nutritional related information given in packaged food.

Malik et al. (2013) described that the nutritional food label is not only limited to the processed food sector but also uniformly followed in restaurants business and fast food outlets. Some of the researchers have uncovered the fact that the function of food label menu is decisive when consumer is concerned about reducing the obesity and overweight issues among customers.

Nagla (2007) in his research explained that consumer buying behavior for food and grocery products has always been influenced by a number of economic, cultural, psychological and lifestyle factors. In the recent decades, sustained economic growth and increasing urbanization are fuelling a rapid growth in the demand for high value food products like fruits, vegetables, milk, meat, eggs and fish. Rao et al. (2006)

According to Landes et al. (2004), continuous rise in middle-income households is having a significant impact on food demand in India because these groups tend to spend a relatively larger share of their income on food consumption and also on upgrading and diversifying their diets, eating out.

A survey had demonstrated that about 64% of American adults were more eager in searching healthy and nutritional foods in the market. This behavior is the reason behind consumer's food and beverage selection by persuading them. The consciousness of healthiness differs among gender that's difference between male and female. It has been reported that women are much careful in avoiding high fat than men. They also tilted about the healthy eating behaviour than men. Wardle et al. (2004)

A study done by Yeung and Yee (2003) concluded that consumer perception about the extreme effect of food on health, initiate consumer to avoid any harmful food intake and increase the concern in finding of more healthy packaged food and nutritional related information given on food label.

III. Research Methodology

In present research, primary survey has been employed through structured questionnaire method, to study various dimensions of consumer buying behaviour. In this study, all Indian consumers are universe, National Capital Region is chosen as an area of study. In the primary survey, responses from 506 customers of packaged food were studied through Questionnaire method. 32 questionnaires were found inappropriate so they were excluded from the study.

The National Capital Region (NCR) in India is the term for the metropolitan area which incorporates the entire National Capital Territory of Delhi. This covers country's capital New Delhi as well as urban areas surrounding it in neighbouring states of Haryana, Uttar Pradesh and Rajasthan. Consumer perspective from eight regions of NCR is studied. Survey was conducted in eight regions of NCR. Various Supermarkets from Bharatpur, Noida and Ghaziabad, Rohtak, Gurugram and Faridabad and Delhi (NCT) were studied through pretested, systematic structured and non disguised questionnaire.

According to household population of the regions ,number of respondent have been surveyed from Delhi 150 respondents, 25 respondents from Rohtak, Gurugram, Faridabad, Meerut, Noida ,Ghaziabad and 24 respondents from Bharatpur had finally been included in study.

Table 1 - Distribution of Respondents according to Supermarket surveyed

S.No.	State	City	Super Market	Respondents	Percentage
1	Rajasthan	Bharatpur	KNGD Mart Private Limited	24	5.10%
2	Delhi	Delhi	More Mega Store	25	5.30%
3	Delhi	Delhi	24/7 Convenience Store	25	5.30%
4	Delhi	Delhi	Metro Cash and Carry	25	5.30%
5	Delhi	Delhi	Reliance Fresh	25	5.30%
6	Delhi	Delhi	Hyper City	25	5.30%
7	Delhi	Delhi	Raj Mandir Super Market	25	5.30%
8	Haryana	Fariadabad	City Market Departmental Store Limited	25	5.30%
9	Haryana	Fariadabad	SRS Value Bazaar	25	5.30%
10	Haryana	Gurugram	Sodhi Super Market	25	5.30%
11	Haryana	Gurugram	More Hypermarket	25	5.30%
12	Haryana	Rohtak	Multigroce	25	5.30%
13	Haryana	Rohtak	Reliance Fresh	25	5.30%
14	Uttar Pradesh	Ghaziabad	Needs The Supermarket	25	5.30%
15	Uttar Pradesh	Ghaziabad	Food Bazaar	25	5.30%
16	Uttar Pradesh	Meerut	Big Bazaar	25	5.30%
17	Uttar Pradesh	Meerut	Daily's A Fresh Store Supermarket	25	5.30%
18	Uttar Pradesh	Noida	Hypercity	25	5.30%
19	Uttar Pradesh	Noida	Spencer's	25	5.30%

Table 2: Summary of Respondent's Demographic profile

Variable		Percent
Gender	Male	47.5%
	Female	53%
Age	18 – 24	20.3%
	25 – 34	33.5%
	35 – 44	25.5%
	45 – 54	10.3%
	55 – 64	6.8%
	65 & above	3.6%
Number Of Working Members In Family	1	40.1%
	2	40.7%
	3-5	16.9%
	> 5	2.3%
Marital Status	Unmarried	41.1%
	Married	58.9%
Monthly Threshold Family Income	0 - 20,000	12.4%
	20,001 - 50,000	21.5%
	50,001 – 1,00,000	33.3%
	> 1,00,000	32.7%
Level of Education	Grade 10 or less	4.0%
	Grade 12	1.5%
	Undergraduate	24.1%
	Postgraduate	62.0%
	Doctorate	8.4%
Family Type	Vegetarian	53.8%
	Non Vegetarian	46.2%
Family Size	< 5	61.6%
	5 – 6	31.2%
	7 – 10	6.5%
	> 10	.6%
Current employment status	Government employee	24.3%
	Private employee	44.1%
	Unemployed	.8%
	Housewife	9.1%
	Student	19.2%
	Retired	2.5%

Multiple sampling techniques were applied; Judgmental sampling was applied for selection of regions of NCR. Convenience sampling was applied for the selection of supermarkets because of constraint of the permission given by the owner of supermarkets to perform the survey. Systematic random sampling is performed for selection of the final respondents.25 customers per supermarket was selected.

IV. Data Analysis

The collected data is analysed through software SPSS (Statistical Package for social sciences) and statistical analyses is carried out such as descriptive statistical analysis, cross-tabulation, frequency distribution, chi-square statistics, and regression analysis to assess the consumers' perspectives on labelling of packaged food. Logistic regression model was developed to predict the likelihood or probability of impact of identified usage factors on food label usage at the time of food purchase by consumers. A logistic regression model is a form of regression where the outcome variable is binary or dichotomous, and the independents are continuous variables, categorical variables or both.

Primary reasons behind Usage of food labels during Pre-packaged food shopping

Six factors were identified which persuade customers to read food label to select the best packaged food for them and their family member's. i.e. (a) Reading food label in a store itself as it affects the purchase decisions instantly, (b) the product is being purchased for the first time, (c) Using label at home as this is more convenient (d) Use label to identify the nutrient content. (e) Use descriptive nutritional label made on front of package, such as low in fat, high in DHA etc. (f) Using food label if the customer or his family members is having some disease or following a special diet for medical reasons.

Table 3 – Mean Score and standard distribution of respondents' usage of food label

Factors	Respondents' usage of food label	Mean scores	SD
(a)	Reading food label in a store to assist with purchase decision	4.80	1.53
(b)	Purchasing packaged food product for the very first time	5.35	1.57
(c)	Using Label at home as this is more convenient	3.69	2.02
(d)	Use label to identify the nutrient content of specific food product	5.57	1.28
(e)	Use descriptive nutritional label made on front of package, such as low in fat, high in DHA etc.	5.36	1.58
(f)	Using food Label if the customer or his family member is following a special diet for medical reasons	5.58	1.54

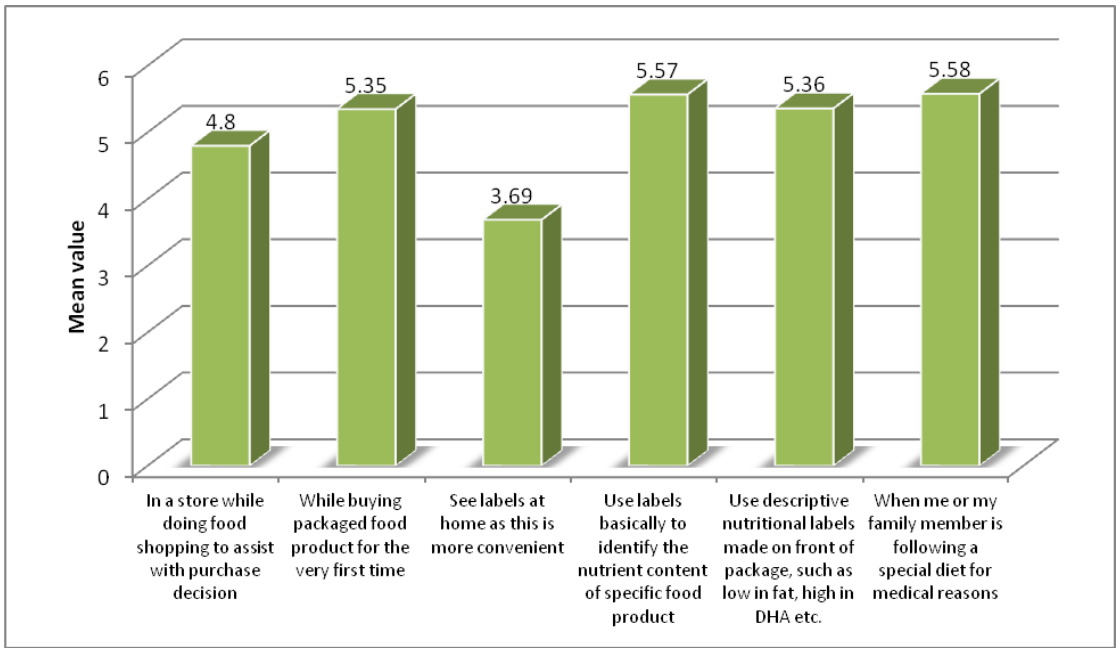

Figure 1- Distribution of respondents according to when more likely to read food label during shopping of packaged food (mean score)

Above table shows the distribution of respondent's reasons for using food label during shopping of packaged food. The mean score of perceptions about when more likely to read food label during shopping of packaged food was more than 5 for most of the perceptions showing assenting about these perceptions.

Socio-Demographic characteristics and effect on usage of Food labels

An empirical model was developed to estimate the relationship between socio-demographic characteristics and the effect of identified usage factors. where all the usage factor are clubbed so that they can give a clear reason behind usage of food label information for example a question was asked to consumers, you use label in a store while doing food shopping to assist with purchase decision? – was transformed into binary variables, which was used as the dependent variable. A set of socio demographic factors – gender, age, no of working members in a family, marital status, family income, education, family type, family size and employment status was used as explanatory variables. The empirical model is defined as:

$$Y_i^* = \alpha + \sum_{i=0}^{n} \beta_i X_i + \varepsilon_i$$

Where Yi* is an unobserved perception held by a consumer towards identified usage factors on food label usage at the time of food purchase by consumers, Xi is a matrix of explanatory variables comprising socio-demographic factors and perceived preferences regarding food labelling attributes, b is a vector of unknown parameters, α is the intercept and ε_i is the error term. Based on the variable used in the present study, the empirical model was specified and estimated as follows, to predict the likelihood or probability of the factors influencing purchase decision based on food labelling.

$$Y_i = \propto + \beta_1 GND + \beta_2 AGE + \beta_3 WMF + \beta_4 MS + \beta_5 INCOM + \beta_6 EDU + \beta_7 FT + \beta_8 FS + \beta_9 EMPLOY + \varepsilon_i$$

Table 4 - Socio-demographic characteristics and their effect on identified factors behind usage of food labels (regression Coefficient and p value approach)

Independent Variables/Predictors		Regression Coefficient (B)	p value for t test
UF	(Constant)	27.054	.000
	Gender	-.671	.223
	Age	.183	.462
	Number Of Working Members In Family	.123	.746
	Marital Status	.117	.856
	Monthly Threshold Family Income	.059	.835
	Level of Education	.685	.043
	Family Type	.292	.580
	Family Size	-.134	.765
	Current employment status	.190	.339

a. Dependent Variable: Usage of food labels

UF = 27.054 + (0.671) GND + (0.183) AGE + (0.123) WMF + (0.117) MS + (0.059) INCOM + (0.685) EDU + (0.292) FT + (-.134) FS + (0.190) EMPLOY

UF=Usage factors, GND=gender, AGE= age, WMF= Number of Working Members in Family, MS= Marital Status, INCOM= Monthly Threshold Family Income, EDU= Level of Education, FT= Family Type, FS= Family Size. EMPLOY= Current employment status.

The Linear regression equation shows that the level of education has the highest influences over identified usage factors, p value also justify the statement, as there is significant relationship between level of education and identified usage factors.

Primary reasons behind non usage of food labels during Pre-packaged food shopping

Difficulties that respondents encounter when reading food label and their reasons for not using food label are listed. (a) Small font size, (b) Insufficient background knowledge, (c) Confusing ingredient list, (d) Price consciousness, (e) Taste consciousness, (f) Believe in the nutritional claim on the front of package and do not verify with the nutritional table at the back of the package and (g) Habit of customers are major factors explained.

It can further be stated that customers who are more involved in the search for and evaluation of information on the food label, they associate a higher risk with a product's use.

Table 5 -Mean Score and standard distribution of respondents' non usage of food label

Factors	Respondents non usage of food label	Mean scores	SD
(a)	Small font size	2.96	1.92
(b)	Insufficient background knowledge	2.84	1.80
(c)	Confusing ingredient list	3.85	1.88
(d)	Price consciousness	2.93	1.84
(e)	Taste consciousness	2.95	1.77
(f)	Believe the nutritional claim on the front of package and do not verify with the nutritional table at the back of the package.	3.82	1.68
(g)	Habit of Consumers	3.08	1.74

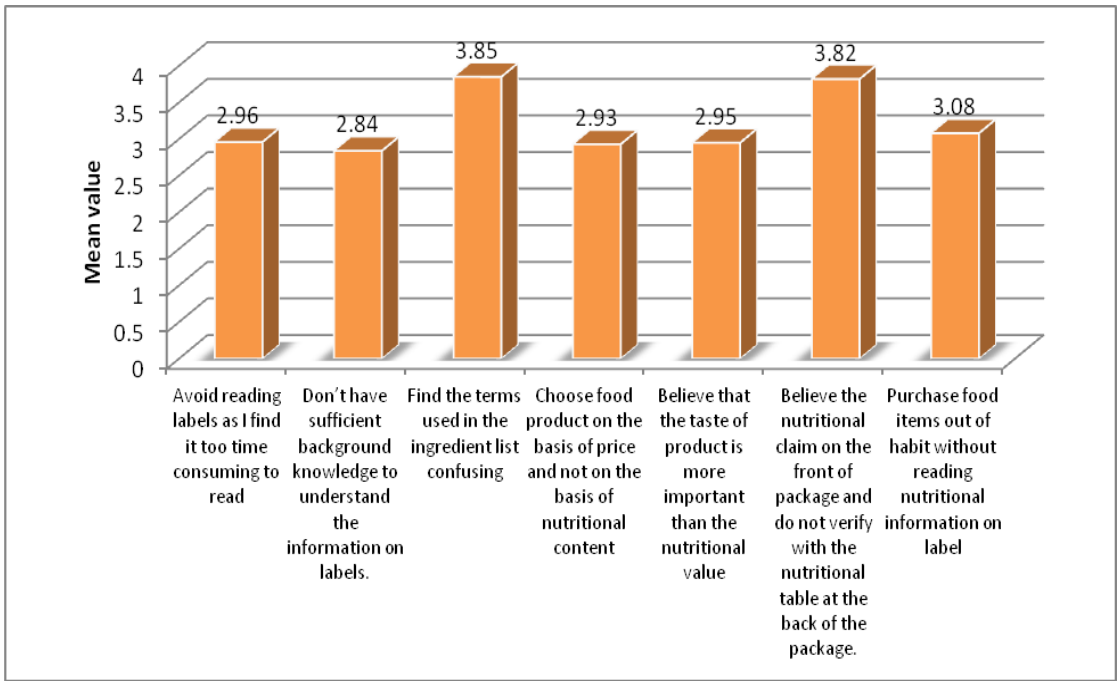

Figure 2- Distribution of Respondent's non usage of food label

Above table and figure shows the distribution of respondents according to when not using food label. The mean score of all factors was less than 5.

Socio-Demographic characteristics and effect on non usage of Food label

Logistic regression model was developed to predict the likelihood or probability of impact of identified non usage factors on food label usage at the time of food purchase by consumers.

$$Y_i * = \propto + \beta_1 GND + \beta_2 AGE + \beta_3 WMF + \beta_4 MS + \beta_5 INCOM + \beta_6 EDU + \beta_7 FT + \beta_8 FS + \beta_9 EMPLOY + \varepsilon_i$$

Table 6 - Socio-demographic characteristics and their effect on factors behind non usage of food labels (regression Coefficient and p value approach)

Independent Variables/Predictors		Regression Coefficient (B)	p value for t test
Non usage	(Constant)	26.280	.000
	Gender	-2.002	.020
	Age	-.072	.852
	Number Of Working Members In Family	-.184	.757
	Marital Status	1.383	.170
	Monthly Threshold Family Income	-.452	.308
	Level of Education	-1.090	.040
	Family Type	1.428	.083
	Family Size	-.557	.426
	Current employment status	.563	.070

a. Dependent Variable: Non Usage of food labels

NUF=26.280 + (-2.002) GND + (-0.072) AGE + (-0.184) WMF + (1.383) MS + (-0.452) INCOM + (-1.090) EDU + (1.428) FT + (-0.557) FS + (0.563) EMPLOY

NUF = Non Usage Factors, GND=gender, AGE=age, WMF= Number of Working Members in Family, MS= Marital Status, INCOM= Monthly Threshold Family Income, EDU= Level of Education, FT= Family Type, FS= Family Size. EMPLOY= Current employment status.

The Linear regression equation shows that gender, marital status, family type and level of education has influences over identified factors, wherein the negative sign shows no usage is higher when the level of education is low. p value also justify the statement, as there is significant relationship between gender (.020) and level of education(.040) on identified non usage factors.

V. Findings

Among studied six factor most important factors identified was using label when customer or his family members is having some disease or following a special diet for medical reasons.

The Linear regression equation was developed and shows that the level of education has the highest influence over identified usage factors, p value also justify the statement, as there is significant relationship between level of education and identified usage factors.

Among studied seven non usage factors, that gender, marital status and level of education has influence over identified factors. Wherein the negative most important factors identified was finding the terms used in the ingredient list confusing.

The Linear regression equation was developed and shows non usage factor are higher when the level of education is low, p value also justify the statement, as there is significant relationship between gender and level of education on identified non usage factors.

VI. Conclusion

Food label play an important function in influencing the buying decision by building consumers' confidence in the safety and quality of the food, and by increasing consumer's awareness on nutrition and health. Every food label should contain information on product price, manufacturing date along with the best before and expiry dates, name and address of the product manufacturer, Warning / instruction about health risk, Ethical information and information on nutritional contents for better management of health risk.

Difficulties are experienced in understanding some terminology found in the ingredient list and nutritional information table; too small font size being used on food label, which negatively affects consumers' use of food label. The government needs to draw the attention of food industries to the permitted size of the font that maybe used on food label and to ensure endorsement of the food labelling regulations.

It was found that consumers have a habit of using food label in-store when purchasing food products. Store personnel could also be an important asset in promoting healthier food choices and should, therefore, be able to assist consumers when they experience difficulties reading the information on the food label.

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