

# Disclosure of Nutrition Information: A Content Analysis of Food Labels

## Dr. Pavleen Kaur

Assistant Professor, University Business  
School, Guru Nanak Dev University  
Amritsar, Punjab, India

## Kiranjot Kaur

Research Scholar, University Business  
School, Guru Nanak Dev University  
Amritsar, Punjab, India

### Abstract

Packaging and labelling are widely used now a days by manufacturers as a promotional tool. Nutritional qualities of food products are communicated through these important tools as it provides information to consumers at the point of purchase and affects their buying behavior. Products carrying nutritional information and claims are highly attracted to the consumers but at the same time complete information is not provided by marketers. So there is difficulty in proper evaluation of nutrition information. This paper attempts to content analyze the nutrition information provided by companies on the labels of food packages. The paper also endeavour's to examine the extent of claims used on the packages of foods products. The relationship of nutrition information and claims across food categories has been determined using chi-square statistics. The results reveal that nutrition information is disclosed through food labels on majority of packaged food products and more than half of the products contain claims on food labels.

### Keywords:

Nutrition, Packaging, Labels, Content Analysis, Chi-square.

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### Introduction

Many chronic diseases like diabetes, cancer and heart disease can occur due to imbalanced diet. So consumers are concerned about nutritional value of their diet. Nutritional information can positively affect the quality of consumer's diet and their food choices if they understand the information provided to them. Consumer's understanding of nutritional information depends on a number of factors like knowledge, health status and awareness, format of information and content of nutrition label.

Nutritional labels can be defined as the depiction of nutritional properties of food that is used to inform customers about the nutrient value (Guidelines on Nutrition Labelling, 1985). It is a technique to attract consumers and help them in buying the right products. For more effective and detailed information, different types of claims are used by the manufactures. Claim can be defined as any depiction or message through pictures, graphs or symbols, which describes that food has particular characteristics relating to nature, properties, processing,

composition or other qualities, although it is not mandatory by the national legislation (Food Safety and Standard Authority of India, 2009). It provides both opportunities and challenges to food marketers, labelers and food packagers (Kumar and Ali, 2011). So food marketers have a growing interest in providing the nutrition information on the food packages voluntarily. A combination of front and back package labels are used to communicate appropriate nutritional information as it can be easily process by consumers because front-panel provides summary of information and back-panel provides complete information (Wansink, 2003). If nutrition and health related information is provided on food labels beyond the minimum requirements, it is known as nutrition marketing (Colby, 2010).

The Nutrition Labelling and Education Act (NLEA) 1990 in United States have a great contribution in the regulatory environment. From the last two decades, nutrition labelling has been widely used in developed countries but in India still it is not completely regulated (Manthena and Rao, 2012). According to World Trade Organization (WTO) agreements, nutritional labelling on processed food and beverage products has been mandatory in India and makers need to state ingredients, weight, total calories, amount of protein, carbohydrate, fat, sodium, sugar, dietary fibre, vitamins and minerals, and amount of trans fats in food and beverages (Intodia, 2011), but it is not strictly followed. Prevention of Food Adulteration Act, 1954, governs the information revealed on food labels in India.

Therefore, the present study endeavors to identify the extent of disclosure of nutrition information and claims on labels of pre-packaged food products marketed in India.

### Previous Research

A brief review of work related to disclosure of nutrition information and claims on food labels is presented here:

**Caswell (1992)** conducted a study on food labels to analyze the prevalence of nutrition labeling. The data was collected from large superstore in western Massachusetts on all the national and private brands sold by them in the month of July and August, 1991. The information was divided into 31 product categories containing 857 brands. The results disclosed that out of 857 analyzed brands, 585 (68.3 percent) brands had nutrition labelling. Caswell concluded that nutrition labelling was used on majority of analyzed brands although it was not mandatory. But there was no consistent pattern that discloses that nutrition labelling was used on which types of products as information was not uniform on all the labels.

**Tee et al. (2002)** assessed the status of six South-East Asia countries regarding nutrition labeling and claims. These six countries were: Brunei, Indonesia, Malaysia, Philippines,

Singapore and Thailand. A survey was conducted in these countries and information was collected from regulatory agencies of these countries through questionnaires and relevant documents. The authors found that nutrition labeling was not mandatory for all selected countries for general foods. But for food meant for special dietary use, enriched or fortified foods and foods that made nutrition claims, nutrition labelling was mandatory. In Malaysia, it was proposed to have mandatory labelling for four nutrients, protein, carbohydrates, fat and energy on food packages.

**Legault et al. (2004)** analyzed the product packages to find out the prevalence of nutrition labelling and claims through food labels and package survey (FLAPS). FLAPS was conducted by the FDA (Food and Drug Administration) to study the food labels. 1281 food products were included in 2000-2001 FLAPS database. The results revealed that nutrition labeling was used on 98.3 percent of FDA regulated packaged foods products sold annually and claims were also found on majority of products. It was concluded that FLAPS data can be used by dietitians and other health professionals to help consumers to identify information for labelling and claims and use these information for choosing healthy diet.

**Bonsmann et al. (2010)** assessed the nutrition information penetration on labels of food products. The data was collected from 27 European Union member states and Turkey from September 2008 to April 2009. 37,365 food and beverages products were audited by segregating into five product categories: sweet biscuits, breakfast cereals, pre-packed chilled ready meals, carbonated soft drinks and yoghurts. The results revealed that on an average, nutrition labeling or related information was found on 85 percent for back-of-pack (BOP) and 48 percent for front-of-pack (FOP) information. From the five selected categories, highest nutrition information penetration was on breakfast cereals, which showed 94 percent BOP penetration and 70 percent FOP penetration. The author concluded that majority of audited food products disclosed nutrition information.

**Colby et al. (2010)** conducted a study to explore how frequently food labels used nutrition marketing that was high in saturated fat, sodium and sugar. The study was conducted in six grocery stores in Grand Forks. 56900 packed food products were selected to evaluate the labels and frequency distributions were calculated from these. The results revealed that nutrition marketing being used by 49 percent products and out of these, 48.1 percent food products contained nutrition marketing and also high in saturated fat (11.1 percent), sodium (16.9 percent) and sugar (31.01 percent).

**Kumar and Ali (2011)** analyzed the nutritional information disclosed on the packaging/ wrapper of major packaged food products. The study covered leading Indian and

multinational brands being marketed in India. Fifteen companies were selected for the purpose of analyses, which comprised of seven regional/national and eight multinational companies. This study included nine packaged food products consisted of snacks, food products and breakfast products. Food labels/wrappers of the products were collected to examine whether the nutritional information such as energy, fat, cholesterol, carbohydrates, fiber, sugars, protein, vitamins etc. has been indicated on the labels. The results indicated that both national and multinational companies disclosed nutritional information on their food labels for helping consumers to make better product choice.

**Kasapila and Shaarani (2013)** analyzed pre-packaged foodstuffs to examine nutrition labeling practices. The data was collected from six different retail stores from April to August, 2011 in Lilongwe, Malawi to recognize opportunities for improvement. Packaged products were grouped into 24 food categories based on Codex standards and total number of products surveyed was 1687. The results of the study revealed that the percentage of products carrying nutrition information was 40.4 percent in Malawi, 84.6 percent in South Africa, 76.4 percent in other Southern Africa countries and 73.3 percent for other countries in Africa. It shows that from all the countries surveyed, Malawi had the lowest percentage of disclosure of nutrition information. For nutrition claims, the results showed that Malawi, South Africa, other southern Africa countries and for other countries in Africa had 14.8 percent, 20 percent, 36.6 percent and 7.6 percent respectively nutrition claims on product packages. It was also found that nutrition claims was used on more than half of the packaged food products but without any corresponding nutrition information. So, it was concluded that Codex guidelines for nutrition labeling was not properly followed.

**Srivastava and Ghufuran (2013)** examined the wrappers of health drinks to analyze the disclosure of nutritional information. Wrappers of 20 major milk based malted health drinks were collected of the leading Indian and multinational brands being marketed in India. The disclosure of nutrients like energy, fat, cholesterol, carbohydrates, fibre, sugars, protein, vitamins, calcium, iron, sodium, minerals etc. were recorded from labels. The results revealed that different marketing strategies were used for disclosure of nutritional information by every manufacturer. There was lack of standard regulatory arrangements for disclosures. The author concluded that information content on health drinks were differ significantly on labels meaning thereby that nutrients were disclosed by organizations but on voluntary basis.

From the previous research, it can be concluded that nutrition labelling is used for marketing of packaged food

products in most of the countries. Nutrition labelling is mandatory in most developed countries but in India still regulations are not strictly followed. So the aim of present study is to understand the extent of disclosure of nutrition information on food labels marketed in India in the present regulatory environment.

### Objectives of the study

The present study is carried out with the following objectives:

1. To content analyze the nutrition information provided by companies on the labels of food packages.
2. To examine the extent of claims used on packages of foods products.

### Research methodology

The study has been carried out on packaged food products marketed in India. From the major food categories in Indian food industry (Food Safety and Standards Authority of India, 2012), six most marketed food categories were selected for analysis. These six food categories were: Dairy Products and Analogues, Fats and Oils and Fat Emulsions, Cereals and Cereal Products, Bakery Products, Beverages excluding Dairy products and Ready-to-eat Savouries. Ten products were selected from each of these six food categories on the basis of fifteen leading brands as outlined by D' Essence Consulting (2009). These products were purchased from retail stores in Amritsar. In order to evaluate nutrition information provided on food labels, information on ten nutrients, energy, protein, carbohydrates, carbohydrates (total sugar), carbohydrates (added sugar), fat, saturated fat, trans fat, cholesterol and sodium was screened to understand the extent of disclosure. Presence of nutrient information was marked as 1 and absence of nutrient information was marked as 0. In order to identify whether claims are used on food marketing in India, comprehensive information was obtained from Draft "Regulation on Labelling (claims)" (Food Safety and Standards Authority of India, 2009). Presence of claim was marked as 1 and absence of claim was marked as 0. Data has been analyzed using frequency tables and chi-square through SPSS17.0.

## Analysis and results

**Table-1: Frequency and percentage of disclosure of nutrients from sixty products**

Nutrients	Nutrition Information	
	N	(percent)
Energy	59	(98.3)
Protein	58	(96.7)
Carbohydrates	59	(98.3)
Carbohydrates (total sugar)	40	(66.7)
Carbohydrates (added sugar)	11	(18.3)
Fat	59	(98.3)
Saturated fat	21	(35.0)
Trans fat	15	(25.0)
Cholesterol	23	(38.3)
Sodium	19	(31.7)

Table-1 shows the frequency and percentage of disclosure of nutrients from the sample of 60 packaged food products. Out of these 60 products, nutrition information of energy, carbohydrate and fat was disclosed on 59 (98.3%) products followed by protein which was disclosed on 58 (98.3%) food products. Nutritional information of carbohydrates (total sugar) was disclosed on 40 (66%) products. Cholesterol, saturated fat, sodium and trans fat were revealed on 23 (38.3%), 21 (35.0%), 19 (31.7%) and 15 (25.0%) products respectively. There was least representation of carbohydrates (added sugar) on the product packages. It was disclosed only on 11 (18.3%) products. So from the sample, the highest disclosing nutrients on food labels were energy, carbohydrates, fats and protein and least disclosing was carbohydrates (added sugar).

Table-2 reveals the frequency and percentage of disclosure of ten nutrients on six food categories. Information on energy, carbohydrate and fat were shown on 59 products. Out of these 59 products, all food categories disclosed energy, carbohydrates and fat information on 10 (16.9%) products each except fats and oils, and fat emulsions that disclosed information of these nutrients on 9 (15.3%) products. The nutrient value of protein was disclosed on 58 products, 10 (17.2%) products of each category but fats and oils, and emulsions category disclosed protein on 8 (13.8%) products. Carbohydrates (total sugar) was shown on 40 products, out of these it was shown on all (25%) products of ready-to-eat savouries followed by 9 (22.5%) bakery products, 7 (17.5%) cereals and cereals products, 6 (15%) beverages products and 5 (12.5%) dairy products. Least information of carbohydrates (total sugar) was shown on the

category of fats and oils, and fat emulsions that accounted for only 3 (7.5%) products. Carbohydrates (added sugar) was shown on 11 products comprised of 5 (45.5%) on dairy products and analogues, 3 (27.3%) on beverages products, 2 (18.2%) on fats and oils, and fat emulsions and 1 (9.1%) on cereals and cereals products. Bakery products and ready-to-eat savouries categories did not disclose any information on labels regarding carbohydrates (added sugar). 21 products contained information regarding saturated fat. Out of these 21 products, the highest disclosure of saturated fat was on bakery products that was followed by fats and oils and fat emulsions, cereals and cereals products, dairy products and analogues, ready-to-eat savouries products accounted for 7 (33.3%), 5 (23.8%), 4 (19%), 3 (14.3%) and 2 (9.5%) respectively. The disclosure of trans fat was on all the food categories except beverages. It included disclosure of trans fat on 6 (40%) bakery products, 3 (20%) products each of fats and oils, and fat emulsions and cereals products, 2 (13.3%) and 1 (6.7%) product of ready-to-eat savouries and dairy products respectively. The nutrition information of cholesterol was shown on 23 food products comprised of 6 (26.1%) bakery products, 5 (21.7%) fats and oils, and fat emulsions products, 4 (17.4%) cereals and cereals products, 3 (13%) each of dairy and beverages and 2 (8.7%) of ready-to-eat products. The highest disclosure of sodium was on dairy products that was accounted for 6 (31.6%) products followed by 4 (21.1%) both of fats and oils, and fat emulsions and cereals category, 2 (10.5%) products each of beverages and ready-to-eat savouries and 1 (5.3%) product of bakery.

**Table-2: Frequency and percentage of disclosure of nutrition information according to food categories**

Food Categories	Nutrients									
	Energy	Protein	Carbo-Hydrates	Carbo-hydrates (total sugar)	Carbo-hydrates (added sugar)	Fat	Saturated fat	Trans fat	Cholesterol	Sodium
	N(percentage)	N(percentage)	N(percentage)	N(percentage)	N(percentage)	N(percentage)	N(percentage)	N(percentage)	N(percentage)	N(percentage)
Dairy products and analogues	10 (16.9)	10 (17.2)	10 (16.9)	5 (12.5)	5 (45.5)	10 (16.9)	3 (14.3)	1 (6.7)	3 (13)	6 (31.6)
Fats and oils, and fat emulsions	9 (15.3)	8 (13.8)	9 (15.3)	3 (7.5)	2 (18.2)	9 (15.3)	5 (23.8)	3 (20)	5 (21.7)	4 (21.1)
Cereals and cereal products	10 (16.9)	10 (17.2)	10 (16.9)	7 (17.5)	1 (9.1)	10 (16.9)	4 (19)	3 (20)	4 (17.4)	4 (21.1)
Bakery products	10 (16.9)	10 (17.2)	10 (16.9)	9 (22.5)	0 (0)	10 (16.9)	7 (33.3)	6 (40)	6 (26.1)	1 (5.3)
Beverages, excluding dairy products	10 (16.9)	10 (17.2)	10 (16.9)	6 (15)	3 (27.3)	10 (16.9)	0 (0)	0 (0)	3 (13)	2 (10.5)
Ready-to-eat savouries	10 (16.9)	10 (17.2)	10 (16.9)	10 (25)	0 (0)	10 (16.9)	2 (9.5)	2 (13.3)	2 (8.7)	2 (10.5)
Total	59 (100)	58 (100)	59 (100)	40 (100)	11 (100)	59 (100)	21 (100)	15 (100)	23 (100)	19 (100)
$\chi^2$	5.085	10.345***	5.085	15.000*	12.579**	5.085	12.967**	11.467**	4.583	7.779
P	0.406	0.066	0.406	0.010	0.028	0.406	0.024	0.043	0.469	0.169

Note: \*significant at 1% level, \*\*significant at 5% level, \*\*\*significant at 10% level.

In order to examine whether there were differences in disclosure of nutrients across food categories chi-square procedure was conducted. The results indicated that there were statistically significant differences in case of nutrients, protein ( $\chi^2=10.345***$  and  $p< 0.10$ ), carbohydrates (total sugar) ( $\chi^2=15.000*$  and  $p< 0.01$ ), carbohydrates (added sugar) ( $\chi^2=12.579**$  and  $p< 0.05$ ), saturated fat ( $\chi^2=12.967**$  and  $p< 0.05$ ), and trans fat ( $\chi^2=11.467**$  and  $p< 0.05$ ). These nutrients were differing in disclosure as they were disclosed

by the manufacturers voluntarily.

While there were no statistically significant differences in the disclosure of nutrients, energy ( $\chi^2= 5.085$  and  $p=0.406$ ), carbohydrates ( $\chi^2= 5.085$  and  $p=0.406$ ), fat ( $\chi^2= 5.085$  and  $p=0.406$ ), cholesterol ( $\chi^2= 4.583$  and  $p=0.469$ ) and sodium ( $\chi^2= 7.779$  and  $p=0.169$ ). These nutrients were mandatory to declare on food packages although these were not strictly followed by all food companies.

**Table-3: Frequency and percentage of presence of claims according to food categories**

Food Categories	Presence Of Claims
	N (percentage)
Dairy products and analogues	4 (11.4)
Fats and oils, and fat emulsions	7 (20.0)
Cereals and cereal products	6 (17.1)
Bakery products	7 (20.0)
Beverages, excluding dairy products	8 (22.9)
Ready-to-eat savouries	3 (8.6)
Total	35 (100)
$\chi^2$	7.749
P	0.171

Table-3 shows the frequency and percentage of presence of claims on food packages. From the entire sample of sixty products, thirty five products contained claims on food packages. Out of these 35 products, beverages products contained the highest number of claims accounting for 8 (22.9%) products followed by fats and oils, and fat emulsions and bakery products accounting for 7 (20%) products each. The packages of cereals products contained 6 (17.1%) claims followed by dairy and analogues that contained 4 (11.4%) claims on food packages. There was little representation of claims in ready-to-eat savouries as compared to other food categories consisted of only 3 (8.6%) claims on food packages.

Chi-square statistics was used in order to examine the difference in the presence of claims across food categories. The results indicated that there was no statistically significant difference in presence of claim across food categories ( $\chi^2 = 7.749$  and  $p = 0.171$ ).

### Conclusion

Nutrition labelling is an attempt to provide the nutritional properties of food products to consumers at the time of purchasing the products, so that they can choose appropriate nutritional food (Grunert and Wills, 2007). Labelling is used as marketing technique by food companies to attract and guide consumers to choose healthy diet and with this they also contributing to achieve public health objectives. But nutrition labelling is not mandatory in all the countries. So through this study, there is an attempt to find out the behavior of companies towards the disclosure of nutrition information on the food labels in India in the present environment. It was found that nutrition information was disclosed on food labels on majority of the packaged food products and different types of claims were used for products marketing, which ultimately helps consumes in selecting the products. The highest disclosing nutrients from the sample of sixty food products were energy (98.3%), protein (96.7%), carbohydrate (98.3%) and fat (98.3%) while the least disclosing nutrient was carbohydrate (added sugar) accounted for 18.3% products. More than half of the products (58.33%) contained claims on food labels.

### Implications

With the changing regulatory environment and customers food preferences, there is a huge change in the Indian food market. Many regulations are provided so that information is better disseminated among consumers regarding nutritional properties the foods contains and facilitates consumers in making better brand choice decisions. Besides mandatory labelling, marketer voluntary use nutrition information on packages as a promotional tool as it provides competitive advantage to food companies. It helps to reduce the information asymmetry and assist companies to face the

global challenges. For consumers, nutrition labelling helps them to make a distinction between large volume of products and improve their dietary patterns. Also dietitians can guide the consumers about how to use the nutrition labelling and information of claims while selecting the products for special dietary needs.

### Limitations of the study

1. The size of sample is small.
2. Time and cost factors have been the constraints while conducting the study.
3. The products were selected from six food categories only.

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