

Status of nutrition and health claims in dairy products and accuracy requirements in the Tehran market

Mohaddeseh Asafari ¹, Peyman Mahasti ², Hasan Hamedei ^{1*}

¹ Department of Food Safety and Hygiene, Science and Research Branch, Islamic Azad University, Tehran, Iran

² Department of Food Quality Control and Hygiene, Science and Research Branch, Islamic Azad University, Tehran, Iran

ARTICLE INFO

Original Article

Article history:

Received 14 February 2021

Revised 22 April 2021

Accepted 04 May 2021

Available online 20 June 2021

Keywords:

Food labeling
Nutrition status
Health claims
Nutrition fact
Dairy products

ABSTRACT

Signs and marks in packaging have an important role in the marketing and identification of the products. The purpose of this study was to determine the accuracy of the inclusion of this information and its compliance with the criteria established by the Food and Drug Administration to identify errors and frauds. In this descriptive-analytical study, 272 samples of dairy products were selected, and their labels were photographed, then the information was investigated with documents in Food and Drug Administration and the general guidelines of food and beverages. Finally, data were analyzed with SPSS software and chi-square tests. Based on the results of this study, it was found that in general, 4%, 7%, 1.1%, 11%, 8.4%, 25%, and 18% of the products presented in Tehran were respectively. The defects did not have the weight net, license number, production date and expiration of the product and the ingredients (same percentage), batch number, storage conditions, instructions for preparation, and the requirements and health recommendations. In nutritional claims, most claims were related to fat, salt, and fiber and 7.7% of the products contained health claims. 45.2% of the samples have descriptive statements, that 18.15% were unauthorized. 14% of the samples lack traffic lights nutrition and 39% did not have a nutrition facts table. Also, 9.9% of the samples were illegible and were not read clearly. Food labels are a tool for measuring the health of products and will have a significant role in reducing NCD. This study reveals the more rigorous monitoring of food labels.

© 2021, Science and Research Branch, Islamic Azad University. All rights reserved.

1. Introduction

According to research, nutritional quality and the need for nutrients are influenced by daily dietary habits (1). Diet does not affect only growth and development. Also, it is associated with health problems such as bone health, tooth decay, eating disorders, obesity, constipation, malnutrition, and anemia with iron deficiency (2). Milk and its products are one of the most important, appropriate, and balanced food which plays an essential role in providing energy, protein, fat, vitamins, and minerals in human health and nutrition(3). Nowadays one of the most important indicators of cultural development is the consumption of milk and its products (4) which is one of the four main groups of foods and the richest sources of calcium in the diet (5). According to the studies about dairy products, there is a high correlation between the consumption of these products and the health of people in the community (6). Dairy

products including milk, yogurt, cheese, yogurt drink, ice cream, and curd, are the most important source of protein, calcium, and magnesium. On the other hand, recent studies have reported the important and effective role of dairy products in lowering blood pressure, decreasing blood lipids, preventing colon cancer, and osteoporosis (7). In a new study, calcium intake, especially of dairy products, has a preventive role in the loss of teeth (8). Meta-analysis Cohort studies indicate that consumes milk and intake dairy has a negative relationship with the risk of breast, colorectal, and bladder cancer, although calcium-rich foods are directly related to the risk of prostate cancer (9). Dairy consumption is associated with risk mitigation of breast cancer (10) and also has a linear reversal relationship with high blood pressure and pulse pressure (11). In addition, it is associated with a reduction in the risk of colon cancer and lead absorption (12, 13). Calcium is one of the bone ingredients minerals in the diet (14) and it is

* Corresponding author: Department of Food Safety and Hygiene, Science and Research Branch, Islamic Azad University, Tehran, Iran.
E-mail address: hamedih@ut.ac.ir (Hassan Hamedei).

recommended 3-4 servings daily (3). Daily consumption of milk provides 65% to 72% of adult calcium (15). Today, it is believed that most of the major health problems and premature mortality in the world can be prevented by behavior change at a low cost (16). The key to achieving food security, improving nutrition, and eliminate malnutrition at the national level is food and nutrition planning (17). Most foodstuffs in stores are packaged, and they have food labeling. The aim of the food labeling system is help to consumers choose healthy foods. To develop each country is essential a healthy community and also; proper and healthy nutrition is necessary for it. In this regard, food information should be provided to the consumer. In some ways, due to the expansion of the food industry and competition, raising the public awareness of health and international trade, food labeling is a useful way to inform (18, 19). Investigation of the information on the food label, such as the date of production and expiration, nutritional information include the amount of calories and other nutrients, provides a healthy choice for consumers (19, 20). In this respect, the observance of principles and rules of food labeling, accuracy, and simplicity of information is important, because inappropriate and non-standard labeling, in addition to misleading and confusing the consumer, causes him to deceive and diminish his humanity (19). Few studies have been done on this subject. According to a study, 3.9, 26.83, 27.44, 29.88, and 22.26 percent of production in Tehran marketing, were respectively included defects in the license, incorrect license, license non-renewal, and illegal insert of "HACCP" and "ISO 22000" certificates (19). In another study, Mirqotbi and et al. (20) show more than half of the consumers reported the illegible and inappropriate place to write the date of production and expiration, inaccuracy of the nutritional information on the food labels. The result of another study reported that the products without labels only their quality was important and select the products with the label are affected by the brand (21). According to the 2004 Food Marketing Institute's Shopping for Health survey, most consumers (83%) always or sometimes checked the nutrition facts panel when buying foods for the first time. Nearly one-half (48%) checks the nutrition facts panel to purchase healthy foods for their family, and nearly one-quarter (23%) do due to losing weight (22). Based on observations in three major UK retailers, in-store interviews and questionnaires filled out at home and returned, 27% of shoppers were found to have looked at the nutrition information on the label, with up to 87.5% of respondents being able to identify the healthier product in a set of labeling products (23). Many studies have examined consumer perception of food labeling and the importance of using these labels to choose healthy food (24-30). Eventually, it can be concluded that the health-related components of food labeling are associated with the prevention of non-communicable diseases (NCDs) (31). In Iran, there are few studies to survey the accuracy of food labeling, and because dairy consumption is one of the most important indicators of health and used by the population in diet widely, so this study was done to review the food labeling requirements and health and nutrition claims of dairy products.

2. Materials and methods

This descriptive-analytical study examines the claims of health and nutrition. The variables studied include descriptive statements (fresh, natural, organic products, enriched foods, irradiation's food), warning statements (susceptible foods, gluten-free products) and the statements of genetically modified foods and probiotic products, public claims (food safety management systems, Safety and Health certificate, pure claims, without preservatives' food, the addition of monosodium glutamate, HALAL, "high potency" and "antioxidant"), nutrition claims (without X, calorie claims, sugar, salt, dietary fiber, fat, cholesterol) health claims, nutritional labels, and Traffic-light nutrition. Variables were investigated in eight chain stores located in four geographical regions of Tehran. 272 samples were selected from dairy products and had been photographed from their labels. The information in photos was matched with documents in the Food and Drug Administration and surveyed their accuracy. After the necessary coordination with the management of each chain store, the review team visited the stores on the days scheduled and selected samples from mentioning stores randomly; then took photos from each dairy product label. Finally, the samples were divided into 10 groups included yogurt, cheese, milk, ice cream, yogurt drink, curd, pizza cheese, cream, butter, and milk and dairy desserts. Data were analyzed with the descriptive statistical method and SPSS v21.

3. Results

In this study, 272 samples were surveyed to an accuracy of nutritional and health claims on dairy products in Tehran. Samples were selected based on the amount of consumption in the consumer basket. Tables 1 to 4 are the distribution and comparison samples according to the labeling requirements. Variables in the labeling requirements include the name of the food and the brand, net weight, license number, batch number, date of production and expiration, ingredients, address, storage conditions, preparation instructions, health requirements. Percentage of defects in dairy products reported in Table 1. In all samples, the name has 100% of the score, and no defect was seen in them. In general, address 0.7%, date of production and expiration and also ingredient 1.1%, net weight 4%, storage conditions 8.4%, license number 7%, batch number 11%, health requirements 18%, and instructions 25% of the samples have defects with requirements. This study surveys the name and related details like inserting the name on the principal display page (PDP), legibility and clarity of the name of the product, matching the name and identity of the product with the permission of the Ministry of Health, define the identity of the product with phrases such as "whole" and "Dry", high emphasis about to be or not to be of a substance in the product, express of the type and origin oil and grade of products that are incomplete 0.7, 0.7, 4.9, 37.9, 95.6, 99.6, and 100 percent, respectively. Of 272 samples are 1.1% of products without date and 98.98% of samples that have the date, there is 79% defect to write the date on PDP and 79.8% not clear, also 21%

of the samples that have been the date on PDP, 1.5% are defective or cleared. In addition, to insert the date on food labeling, there is another problem that is the format of this information. The samples have 0.4% defects in insertion

address and telephone, 1.1% don't insert this information on the information panel (IP) with the legible and unclear format, and 3.3% haven't the phrase "made in Iran." Defects of the ingredients section include; don't insert the ingredient in (IP)

Table 1. Percentage of labeling requirements.

Requirements	Number (percentage)	Chi-square	Requirements	Number (percentage)	Chi-square
Name of food			Address		
Yes	272 (100)	177.63	Yes	270 (99.3)	264.05
No	0 (0)		No	2 (0.7)	
Net weight			Batch number		
Yes	261 (96)	268.01	Yes	242 (89)	165.23
No	11 (4)		No	30 (11)	
License			Storage condition		
Yes	253 (93)	264.05	Yes	259 (95.2)	222.48
No	19 (7)		No	13 (4.8)	
Date			Introduction		
Yes	269 (98.9)	260.13	Yes	68 (25)	68
No	3 (1.1)		No	204 (75)	
Ingredient			Health requirement		
Yes	269 (98.9)	260.13	Yes	49 (18)	111.30
No	3 (1.1)		No	223 (82)	

and the content of the preservative is 83.8%. Based on the rules and regulations for dairy products, fat content is mandatory, content of the substance 75%, the percentage of the fat 28.3%,

Table 2. The amount of date, fat percentage, and instructions for dairy products.

Dairy	Date of food (%)	Percentage of fat (%)	Instructions (%)
Yogurt			
Yes	267 (98.3)	240 (88.3)	--
No	5 (1.7)	32 (11.7)	
Milk			
Yes	100 (100)	248 (91.2)	27 (47.4)
No	0 (0)	24 (8.8)	30 (52.6)
Yoghurt drink			
Yes	100 (100)	157 (57.6)	22 (66.7)
No	0 (0)	15 (42.4)	11 (33.3)
Ice Cream			
Yes	100 (100)	6 (2.3)	--
No	0 (0)	266 (97.7)	
Curd			
Yes	100 (100)	163 (60)	6 (60)
No	0 (0)	109 (40)	4 (40)
Pizza cheese			
Yes	(87.5)	100 (100)	3 (37.5)
No	(12.5)	0 (0)	5 (62.5)
Cream			
Yes	100 (100)	100 (100)	--
No	0 (0)	0 (0)	
Butter			
Yes	100 (100)	109 (40)	-
No	0 (0)	163 (60)	
Cheese			
Yes	--	--	7 (14.9)
No	--	--	40 (85.1)

additive 29.8%, expression of the additive name with ADI 1.5%, readability and clarity 5.9%, listed in descending order of ingoing weight 12.9%, expression of ingredients by quantity 71.3%, expression of the allergenic food 100%, source of the ingredient 29.8%, mineral, and vitamins 5.5%, the name of the (acceptable daily intake) 95.6%, the emphasis on low or high

expression the name of the hardening agent followed of the stabilizer 58.1%, the water added in the list 79.8%, the color used in the products 97.1%, insert of the salt content 27.6% but doesn't have 28.3% of the samples. Given that insert the percentage of fat in all dairy products is mandatory, but in groups of yogurt, milk, dough, ice cream, curd, and butter, defects are 11.7, 8.8, 42.4, 97.7, 40, and 60%, respectively. All groups of cheese, pizza cheese, and cream can be seen in the following Table 2. The defects in batch number are related to insertion it on DPD, legible and clear, and also insertion barcode 93.4, 94.5, and 0.7 percent respectively. Inserting the storage conditions on the information panel, illegible and unclear, the conditions and time for storage after opening are defective 5.5, 4, and 89%, respectively. Also, there is no indication of the phrase "if the product is prepared for consumption by a particular age group or a specific group, it's necessary on the labeling." The most important element in food label format is the clarity and readability of the information. Table 3 shows the problems in printed images on labels. Tables 4-7 reported the distribution and comparison of the samples about nutritional and health claims. Variables in this section are descriptive and warning statements in terms

Table 3. The format of pictures and phrases on food labeling.

Phrases and images	Number (Percentage)
Realizing images and avoiding exaggeration	
Yes	0 (0)
No	272 (100)
Don't hide components	
Yes	247 (9.2)
No	25 (90.8)
Match color background and nutrition fact table	
Yes	245 (90.1)
No	27 (9.9)
Background color of the nutrition fact tables should be white and its font is black	
Yes	116 (42.6)
No	156 (57.4)

of natural and fresh expressions, organic products, enriched foods, irradiation foods, sensitive foods, gluten-free products, genetically modified foods, and probiotic products. Also, in the section of claims survey the certification for food safety management systems, safety, and health certification, and no preservatives food. The percentages of statement defects are shown in the dairy products in Tehran in Table 4. According to Table 4, the phrase "fresh" was 17.6% that explained 94.5%

for the brand and 5.87% for the taste and it is the rate of defects of food labeling of The Food and Drug Administration. Also, 93.7% of samples used "natural" phrases, and only 3.3% of the products are enriched. None of the samples in this study are organic food. Following the regulation of food labeling of dietary and sports nutrition supplements, the warning statements must be written on the food label to warn the consumers. The purpose of susceptible foods is foods that

Table 4. The deficiencies of descriptive, warning, and specialty food statements in dairy products, according to the regulation food labeling.

Descriptive	Number (percentage)	Specialty food	Number (percentage)	Warning	Number (percentage)
Fresh		GMO		Susceptible food	
Yes	47 (17.6)	Yes	0 (0)	Yes	0 (0)
No	224 (82.4)	No	272 (100)	No	272 (100)
Use fresh words for brand name		Probiotic		Sensitivity food	
Yes	15 (5.5)	Yes	20 (7.4)	Yes	0 (0)
No	256 (94.1)	No	252 (92.6)	No	272 (100)
Use fresh words for taste		Genus and spices		Gluten-free	
Yes	33 (12.1)	Yes	16 (5.9)	Yes	3 (1.1)
No	239 (87.9)	No	256 (94.1)	No	269 (98.9)
Use natural word		Minimum cell			
Yes	17 (6.3)	Yes	8 (2.9)		
No	255 (93.8)	No	264 (97.1)		
Enriched food		Storage conditions			
Yes	9 (3.3)	Yes	12 (4.4)		
No	263 (96.7)	No	260 (95.6)		
Organic food					
Yes	0 (0)				
No	272 (100)				
Irradiation food					
Yes	0 (0)				
No	272 (100)				

should be kept in the refrigerator and must be written the phrase "sensitive foods should be kept in the refrigerator" on food labeling (by the regulations), but don't find the above factors in none of the samples. In reviewing the claims of probiotic products according to the regulation of the Food and Drug Administration, all probiotic products must insert the genus and species, the minimum number of living cells, and the storage conditions. The defects associated with the types of statements are shown in Table 4. Furthermore, in probiotic products must be written the genus, species, and race, the minimum number of live probiotic cells for each species until

to the last day of shelf-life of the product in terms of CFU/g or CFU/ml, and to be mentioned storage conditions. Although among samples, only 5.9% of the products introduce the genus and race of them and 2.9% explained the minimum of live cells. Also, 4.4% of the samples have storage conditions, whereas all of the samples must be having all of these factors on their labels. The amount of these discrepancies can be seen in Fig.1 and 2. The products that get a safety and health certification are healthy, and if the product does healthier, it will easier to get. This study doesn't report a positive relationship between low-fat, low-sodium, high fiber, fortified, and probiotic claims and products which have health and safety certification. All of the above factors are necessary for getting this certification. The information is listed in Table 5. (So you can see details in Fig. 3.). In the section of claims results include; food without preservatives (1.1%), antioxidant claims (0.4%), Salt-related claims (2.2%), fiber claims (1.8%), and fat claims (17.3%). (Table 2). Also, in products like Lighvan cheese with 2.55% fat, used the term "cholesterol reduction", according to the regulation of food labeling isn't permitted this phrase in the probiotic product that has the amount of fat more than 0.5% to public health properties, but 0.4% of samples have this cheat. These defects are visible in Table 6. According to be mandatory Light-traffic label on the products, there are 14% defects. In the nutrition fact label should be written declaration of nutrients in per 100 grams and write the information on a table and they can't be printed on

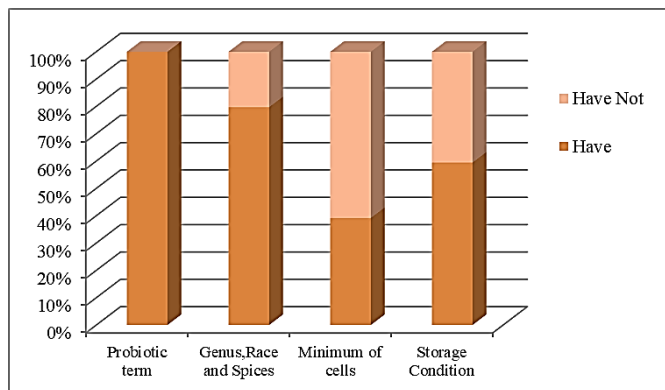


Fig. 1. Comparison between genus and minimum of cells in probiotic products.

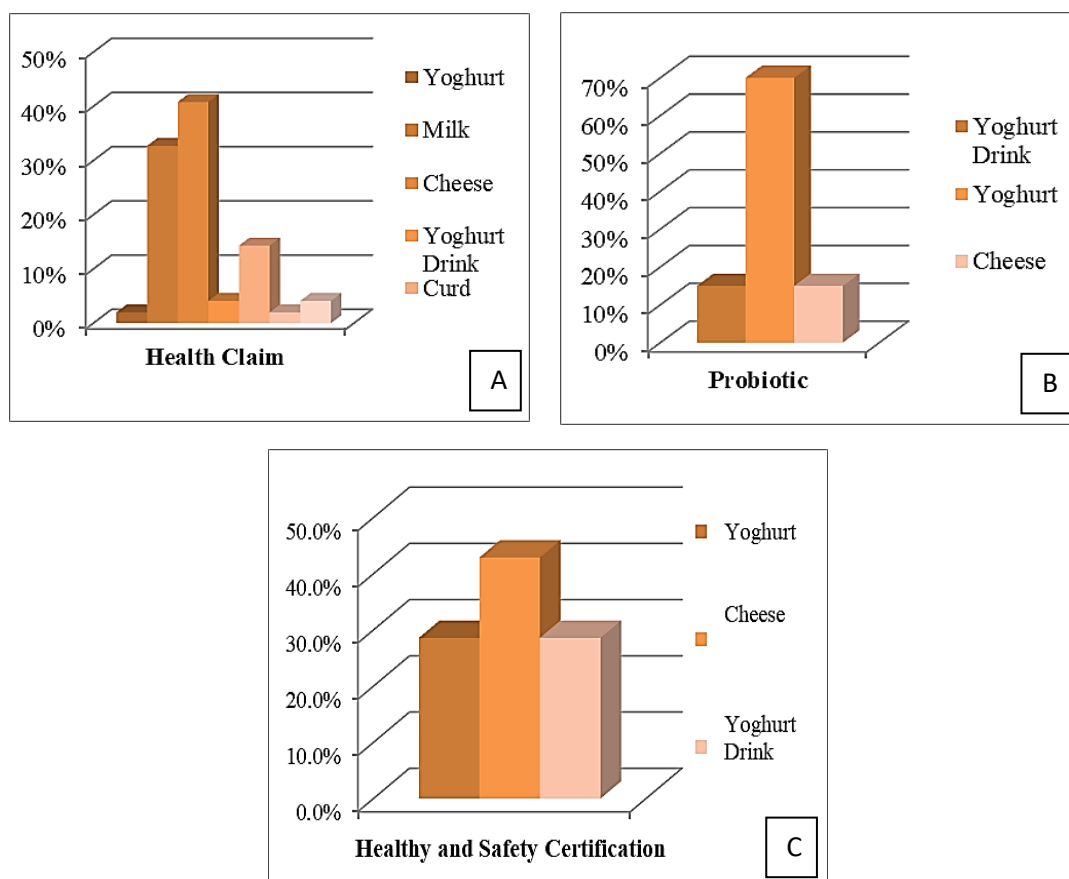


Fig. 2. The percentage of dairy products in Tehran markets, which have a health claim (A), probiotic claim (B), and a health and safety certification (C).

different panels. The nutrient sequence on the table should be accorded with the nutrition fact table, and the manufacturer is not allowed to remove rows of the table, if the product does not contain these compounds, the table should be set to zero.

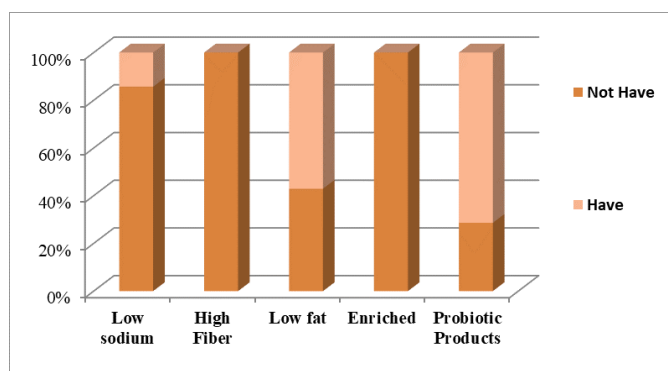


Fig. 3. Comparison of the percentage in dairy products with claims of salt (low sodium), fiber (high fiber), fat (low fat), enriched, and probiotics that have health and safety certification.

In [Table 7](#), you can see the defects in the template and rules related to the nutrition fact table. The defects of enriched foods are available in [Table 7](#). Also in the regulation of food labeling the word "Full of" should contain 20% of the daily requirement and 50% for vitamin C. But for some compounds don't define

the daily value and can't be used the phrases "Full of", and it can only be stated that "the product contains the X gram, matter Y." In these samples 0.4% of the products contained the phrase "Full of"; but unfortunately, was not expressed the daily value of the compounds, even did not replace the phrase "product containing X grams of matter Y."

4. Discussion

This study shows that 6.2% of the samples have defects with the requirements and rules of the Food and Drug Administration of food labeling. In the lowest category for defects, there are license number (93%), batch number (89%), and health recommendations (82%). Also, Delshadian and et al. (19) reported that there are defects in labeling include not extended production license, unallowed HACCP certificate and unallowed ISO 22000 certificate of license number, no extended license, and illegal insertion of ISO 22000 and HACCP certificates. Among all the samples 1.1% of them do have not the date of production and expiration and also there is a distorted label in samples. The expiration date on a product means preventing harm after consumption of products in a specific period. About dairy products, the issue of corruption is more important. Consumption of corrupt dairy products and expired is cause poisoning (32). In the ingredients section on the rule of food labeling is a statement for dairy products that

is necessary to write the amount of fat on these products (18). Also, in the food industry, palm oil adds to dairy products so cheese, analog processing cheese, processed pizza cheese and mixed ice cream with the term "vegetable oil" (33, 34) and dairy producers are catching saturated fat existing milk production in accordance with the standard. So consumers should know that they do not consume milk fat, and they are eating vegetable oil added to milk, but 99.6% of samples have defects in this criterion. In this study, 4% of the samples have defects in the net weight and many products do not have the same written weight with weight measured. Also, 7% of the samples in this study are defective in their license number and

11% of samples are incomplete in the batch number. For all products, there is a number that is called the batch number and is necessary. In fact, it's the serial number of each unit of manufacturing that identifies products through it, and this number can collect products from the marketing. We also found that 45.2% of the samples have descriptive statements while 50.18% of them are not allowed. "Descriptive statements" is a statement that describes the state or process carried out on the product (35). Enriched descriptive statements in the samples are 3.3% that 50.55% of them are incompatibility and incompatibility and non-compliance with standards of Food and Drug Administration. Contrary to Table

Table 5. Amount of dairy groups containing health and nutrition claims, and health and safety certification in products with health and safety certification based on the regulation food labeling that set by the Food and Drug Administration.

Dairy product	Factors	Yogurt	Milk	Cheese	Yogurt drink	Curd	Cream	Butter	Total (%)
Probiotic products		14 (70)	-	3 (15)	3 (15)	-	-	-	
Healthy and safety certification		2 (28.6)	-	3(42/9)	2 (28/6)	-	-	-	7 (100)
	Salt	Yes No	1 (14.3) 6 (58.7)						
	Fiber	Yes No	0 (0) 7 (100)						
Nutrition claims in products with healthy and safety certification number	Fat	Yes No	4 (57.1) 3 (42.9)						
	Enriched	Yes No	0 (0) 7 (100)						
	Probiotic	Yes No	5 (71.4) 2 (28.6)						
Health claims number (percentage)		1 (2)	16 (32.7)	20 (40.8)	2 (4.1)	7 (14.3)	1 (2)	2 (4.1)	49 (100)

2, the rate for "enriched" on dairy products is 3.3% and in accordance with the guidelines and rules of food labeling and dietary supplements, food only can claim fortified that enrichment is according to the mentioned values and analysis

indicated that there were -10 to +10 percent of the claimed amount. According to Richardson et al. (36) add nutrients to food must require food regulations, nutrition labels, nutritional logic, and analysis to adapt with statements and claims

Table 6. The deficiencies in public, nutrition, and health claims of dairy products with regulation food labeling standards.

Public Claims	Number (percentage)	Nutritional claims	Number (percentage)	Health claims	Number (percentage)
FSMS		Without		Probiotic	
Yes	148 (54.4)	Yes	3 (1.1)	Yes	20 (7.4)
No	124 (45.6)	No	269 (98.9)	No	252 (92.6)
Health and safety certification		Calorie		Claiming over the ministry of health	
Yes	7 (2.6)	Yes	0 (0)	Yes	5 (1.8)
No	256 (97.4)	No	272 (100)	No	267 (98.2)
Pure claim		Sugar		Cholesterol reduction in products with fat content of more than 0.5%	
Yes	0 (0)	Yes	0 (0)	Yes	1 (0.4)
No	272 (100)	No	272 (100)	No	271 (99.6)
Without food preservatives		Sodium		Light traffic label	
Yes	3 (1.1)	Yes	6 (2.2)	Yes	234 (86)
No	269 (98.9)	No	266 (97.8)	No	38 (14)
Halal claim		Fiber			
Yes	161 (59.2)	Yes	5 (1.8)		
No	111 (40.8)	No	267 (98.2)		
Antioxidant claim		Fat			
Yes	1 (0.4)	Yes	47 (17.3)		
No	271 (40.8)	No	225 (82.7)		
Probiotic claim		Cholesterol			
Yes	20 (7.4)	Yes	0 (0)		
No	252 (92.6)	No	272 (100)		

Table 7. Defects of enriched food on food labeling.

Enriched Food	Number (percentage)	Nutrition fact table	Number (percentage)	Nutrition fact table	Number (percentage)
Serving size		White background		Total Carbohydrate	
Yes	1 (0.4)	Yes	(61)	Yes	148 (54.4)
No	271 (99.6)	No	(39)	No	134 (45.6)
Serving per container		Table Title		Sugar	
Yes	5 (1.8)	Yes	58 (21.3)	Yes	88 (32.4)
No	267 (98.2)	No	214 (78.7)	No	184 (67.6)
Calorie per serving		The phrase "100 grams of food"		Fiber	
Yes	0 (0)	Yes	81 (29.8)	Yes	3 (1.1)
No	272 (100)	No	191 (70.2)	No	269 (98.9)
The amount of nutrients added based on RNI		The phrase "per serving"		Protein	
Yes	0 (0)	Yes	103 (37.9)	Yes	149 (54.8)
No	272 (100)	No	169 (62.1)	No	123 (45.2)
The phrase "contains"		Calorie		Daily value for protein	
Yes	2 (0.7)	Yes	159 (58.5)	Yes	77 (28.3)
No	269 (98.9)	No	113 (41.5)	No	195 (71.7)
The phrase "good source"		Fat		Vitamins	
Yes	0 (0)	Yes	166 (61)	Yes	17 (6.3)
No	272 (100)	No	106 (39)	No	250 (91.9)
The phrase "full of"		Fatty acid		Vitamins & minerals percentage	
Yes	1 (0.4)	Yes	2 (0.7)	Yes	22 (8.1)
No	271 (99.6)	No	269 (98.9)	No	250 (91.9)
The phrase "excellent source"		Sodium		Daily Value	
Yes	0 (0)	Yes	139 (51.1)	Yes	56 (20.6)
No	272 (100)	No	133 (48.9)	No	216 (79.4)

expressed in the food label. Unfortunately, there is no consistency in food labels. Use of the word "fresh" isn't allowed in the brand and for taste products (18). And the percentage of samples that have this expression, they have violation. 99.63% of samples don't have warning statements, and 0.36% of these statements are invalid. For example, the "gluten-free" phrase can be seen in dairy products like milk and butter. In part of health claims, 7.4% are related to probiotic claims but 95.6% of them do not comply with the criteria. In the study by Siu (37) the labeling probiotic does not match one hundred percent with the criteria. Also, in the study by Silva et al. (38), there is at least one mistake in the labeling of dairy products that require continuous monitoring by health organizations to ensure the labeling of probiotic products and is matched with the results of this research. Finally, from all of the health claims 68.4% are not according to the labeling regulations of Food and Drug Administration. According to studies on nutrition facts policies, consumers with skimming can look at information about nutritional quality and their nutritional needs. These results show the importance of linking food labels and health consumers (25). In addition, researchers have found that the use of these labels improves the quality of nutrition (39), decreases the amount of energy (40), and increases the consumption of fruits and vegetables (24). According to the Besler (41) study, 72.4% of consumers check the nutrition facts table. Also, Shine (42) reported that 88% of people attended to these labels. Based on these studies and the importance of food labeling on health in the community, also a high percentage of attention to this information, the accuracy of insert this information is very important. In this study, 61% of samples have nutrition facts table and 3.2% samples of

nutritional claims including salt claims with and without sodium or salt, without extra salt, very low salt or very low sodium, low salt or low sodium and salt-reduced, which claims in samples express "low sodium or low salt in the products with 140 mg or less sodium per portion of the product." Legault et al. (43) report the health claims (4.4%) and nutritional claims (49.7%), which in comparison with our study increase the level of nutritional claims and reduce health claims. In the last years, have been designed understandable and tangible signs that called traffic light labeling and describes nutritional information for food labels. This label is an effective food labeling system that helps reduce the prevalence of obesity and is a new public health policy (44). Therefore, is an important principle the comprehensibility of food labeling systems (45, 46)? The results indicate that traffic light labeling helps people to choose healthier food in shopping (47-49). According to studies, consumers are more likely to use these labels to identify healthier products than other labeling systems (50, 51). The benefits of these labels are helping consumers use nutritional information for healthier choices. Thorndike et al. (52) show that decrease sale of products with the red label from 24% to 20% and increase the sale of products with green color from 41% to 46%. Despite all the above, one of the key factors in food labeling is the formatting and insertion of phrases and images so that does not hinder reading the information and read easily. Unfortunately, 9/2% of samples are packaged somehow that hide some information of label and do not readably them. Additionally, 9.9% of samples haven't coordinated in background color with the font color. If any person cannot read items on the label so they cannot obtain the necessary information. Mirqotbi (20)

shows more than half of consumers claimed this information is illegible, inappropriate insertion place, and unclear in the nutritional information on food labels. Also, Mackey et al. (53) seven percentages out of 100 samples, their information was readable easily, 26% hard and 67% incomprehensible.

5. Conclusion

According to legal requirements in food labeling for industries and manufacturers, to increase the health indicators should pay attention to food labeling to keep their health. Having a balanced diet is effective in preventing and limiting chronic diseases and an important point in a healthy diet is controlling the amount of sugar, salt, fat, and calorie per day which nutrition labels provide this information to consumers. Because monitoring food is different in other countries, but all of them use standard protocols. The monitoring should be repeated over time, so we can be compared. The importance of data transfer should be considered by food labeling components and estimated effectiveness of labels on healthy people and their choosing for healthy foods. According to this study, more dairy products are faced with problems on the labeling which this monitoring by health and regulatory agencies is necessary to ensure correct labeling of these products and even probiotic products. According to the importance of food labeling, suggested that further research be on the labeling of food products and related laws in our country or in comparison with other countries that in the future could play an important role in improving product quality and consumer's health and preventing non-communicable diseases.

References

1. Afshoon, E., et al. Food habits and some related factors in families of Kohgiluyeh and Boyer-Ahmad. in 9th Iranian Nutrition Congress. 2006. Tabriz University of Medical Sciences.
2. Soheili Azad A, Nourjah N, Norouzi F. Survey the eating pattern between elementary students in Langrood. *Journal of Guilan University of Medical Sciences*. 2007;16(62):36-41.
3. Karandish M, Djazayeri A, Mahmoudi M, Behrouz A, Moramezi F. The effect of calcium supplements during pregnancy on birth weight. *Journal of Reproduction and Infertility*. 2003;3(15):184-91.
4. Yaghoobi, A., L. Moosavi, and M. Javdan, Survey Microbial Status of Milk and Dairy Products in Hamedan Province 2004-2005. 9th Iranian Nutrition Congress, 2005.
5. Hajiabdolbaghi, T., et al. Survey effect of education on the attitude in women that referring to health centers in the south of Tehran to use the non-pasteurized dairy products (local) in 2005-2003. 2006. Tabriz University of Medical Sciences.
6. Teimouire A. National north milk festival, ed. F. edition. 2006, Tehran: Avai-e-Masieh Publications.
7. Jooyande H, Mortazavi A, Rohani M. Milk Technology and dairy products. 1995, Mashhad: Ferdowsi University of Mashhad.
8. Adegboye ARA, Christensen LB, Holm-Pedersen P, Avlund K, Boucher BJ, Heitmann BL. Intakes of calcium, vitamin D, and dairy servings and dental plaque in older Danish adults. *Nutrition Journal*. 2013;12(1):61.
9. Lampe JW. Dairy products and cancer. *Journal of the American College of Nutrition*. 2011;30(sup5):464S-70S.
10. Dong JY, Zhang L, He K, Qin LQ. Dairy consumption and risk of breast cancer: a meta-analysis of prospective cohort studies. *Breast Cancer Research and Treatment*. 2011;127(1):23-31.
11. Crichton GE, Elias MF Dore, GA, Abhayaratna WP, Robbins MA. Relations between dairy food intake and arterial stiffness: pulse wave velocity and pulse pressure. *Hypertension*. 2012;59(5):1044-51.
12. Elwood PC, Givens D I, Beswick AD, Fehily AM, Pickering JE, Gallacher J. The survival advantage of milk and dairy consumption: an overview of evidence from cohort studies of vascular diseases, diabetes and cancer. *Journal of the American College of Nutrition*. 2008;27(6):723S-34S.
13. Singh G, Arora S, Sharma GS, Sindhu JS, Kansal VK, Sangwan RB. Heat stability and calcium bioavailability of calcium-fortified milk. *LWT-Food Science and Technology*. 2007;40(4):625-31.
14. Prentice A. Milk intake, calcium and vitamin D in pregnancy and lactation: effects on maternal, fetal and infant bone in low-and high-income countries, in Milk and Milk Products in Human Nutrition. 2011, Karger Publishers. p. 1-15.
15. Yekefallah L, Vaezi AA, Pazokian M, Yekefallah F, Samieefard F. Study of lifestyle and preventive behaviors of osteoporosis among adolescents in Qazvin. *SSU_Journals*. 2012;20(3):259-68.
16. Khorsandi M, Shamsi M, Jahani F. The survey of practice about prevention of osteoporosis based on health belief model in pregnant women in Arak city. *Journal of Rafsanjan University of Medical Sciences*. 2013. 12(1): p. 35-46.
17. Vakil M, Kavosi E, Shenavar M. A survey on food consumption patterns and nutritional status families in Fars province in 2002. in 9th Iranian Nutrition Congress 2006. Tabriz University of Medical Sciences.
18. Code of dietary and sports supplements, M.o. H.A.M.E., Food and Drug Administration Food and Drug Administration, in PEI/CrV1/0029. August 2011.
19. Delshadian, Z., et al., Evaluation Of Food Labeling For Dairy, Meat and Fruit Juice Products Launched In Tehran Market. 2015.
20. Mirghotbi M, Bajan M, Amiri Z. A survey knowledge and practice of consumer in food labels. *Payesh*. 2010;11(4):505-10.
21. Torres-Moreno M, Tarrega A, Torrecasana E, Blanch C. Influence of label information on dark chocolate acceptability. *Appetite*. 2012;58(2):665-71.
22. Borra S. Consumer perspectives on food labels. *The American Journal of Clinical Nutrition*. 2006;83(5):1235S.
23. Grunert KG, Wills JM, Fernández-Celemín L. Nutrition knowledge, and use and understanding of nutrition information on food labels among consumers in the UK. *Appetite*. 2010;55(2):177-89.
24. Campos S, Doxey J, Hammond D. Nutrition labels on pre-packaged foods: a systematic review. *Public Health Nutrition*. 2011;14(8): 1496-506.
25. Cowburn G, Stockley L. Consumer understanding and use of nutrition labeling: a systematic review. *Public Health Nutrition*. 2005;8(1):21-8.
26. Hawley KL, Roberto CA, Bragg MA, Liu PJ, Schwartz MB, Brownell K D. The science on front-of-package food labels. *Public Health Nutrition*. 2013;16(3):430-9.
27. Hersey JC, Wohlgenant KC, Arsenault JE, Kosa KM, Muth MK. Effects of front-of-package and shelf nutrition labeling systems on consumers. *Nutrition Reviews*. 2013;71(1):1-14.
28. Hieke S, Taylor CR. A critical review of the literature on nutritional labeling. *Journal of Consumer Affairs*. 2012;46(1):120-56.
29. Mhurchu CN, Gorton D. Nutrition labels and claims in New Zealand and Australia: a review of use and understanding. *Australian and New Zealand Journal of Public Health*. 2007;31(2):105-12.
30. Wartella EA, Lichtenstein AH, Boon CS. Examination of front-of-package nutrition rating systems and symbols. Phase I report. Institute of Medicine (IOM), 2010.
31. Rayner M, Wood A, Lawrence M, Mhurchu C N, Albert J, Barquera S, Friel S, Hawkes C, Kelly B, Kumanyika S, L'abbé M, Lee A, Lobstein T, Ma J, Macmullán J, Mohan S, Monteiro C, Neal B, Sacks G, Sanders D, Snowdon W, Swinburn B, Vandevijvere S, Walker C. Monitoring the health-related labelling of foods and non-alcoholic beverages in retail settings. *Obesity Review*. 2013;14:70-81.
32. Mohtasab, T.A., et al. Survey of microbiology of milk and dairy products pasteurized in Kashan city 2005. in 9th Iranian Nutrition Congress. 2006. Tabriz University of Medical Sciences.
33. Institute of Standards and Industrial Research of Iran, skimmed milk ice-cream powder– Specifications & Test Methods.ISIRI no 20217. 1st edition, ISIRI; 2016. (In Persian).

34. Institute of Standards and Industrial Research of Iran. Processed analogue cheese - Specifications. ISIRI no 10696.1st edition, ISIRI ;2007. (In Persian).
35. Alimentarius C. Food Labelling 5th ed. 2007, Rome: FAO/WHO.
36. Richardson D. Food fortification. *Proceedings of the Nutrition Society*. 1990;49(1):39-50.
37. Siu S. Examination of probiotics labeling: analyzing the accuracy of labeling on probiotic products. 2018.
38. Silva, E.G., et al., Adequacy of probiotic and prebiotic dairy foods labeling. *International Journal of Probiotics & Prebiotics*. 2010;5(1): 27.
39. Lin CTJ, Lee JY, Yen ST. Do dietary intakes affect search for nutrient information on food labels? *Social Science & Medicine*. 2004;59(9):1955-67.
40. Zafar MZ, Hashim NA, Halim F. Food label makes individual healthy. *Journal of Scientific Research and Development*. 2016;3(1):68-76.
41. Besler HT, Buyuktuncer Z, Uyar MF. Consumer understanding and use of food and nutrition labeling in Turkey. *Journal of Nutrition Education and Behavior*. 2012;44(6):584-91.
42. Shine A, O'Reilly S, O'Sullivan K. Consumer attitudes to nutrition labelling. *British Food Journal*. 1997;99(8):283-9.
43. Legault L, Brandt MB, McCabe N, Adler C, Brown AM, Brecher S. 2000–2001 food label and package survey: an update on prevalence of nutrition labeling and claims on processed, packaged foods. *Journal of the American Dietetic Association*. 2004;104(6):952-8.
44. Stein K. A national approach to restaurant menu labeling: the Patient Protection and Affordable Health Care Act, Section 4205. *Journal of the American Dietetic Association*. 2010;110(9):1283.
45. Carbone ET, Zoellner JM. Nutrition and health literacy: a systematic review to inform nutrition research and practice. *Journal of the Academy of Nutrition and Dietetics*. 2012;112(2):254-65.
46. Kindig DA, Panzer AM, Nielsen-Bohlman L. Health literacy: a prescription to end confusion. 2004: National Academies Press.
47. Morley B, Scully M, Martin J, Niven P, Dixon H, Wakefield M. What types of nutrition menu labelling lead consumers to select less energy-dense fast food? An experimental study. *Appetite*. 2013;67,8-15.
48. Roberto CA, Bragg MA, Schwartz MB, Seamans MJ, Musicus A, Novak N, Brownell KD. Facts up front versus traffic light food labels: a randomized controlled trial. *American Journal of Preventive Medicine*. 2012;43(2):134-41.
49. Thorndike AN, Sonnenberg L, Riis J, Barraclough S, Levy DE. A 2-phase labeling and choice architecture intervention to improve healthy food and beverage choices. *American Journal of Public Health*. 2012;102(3):527-33.
50. Borgmeier I, Westenhoefer J. Impact of different food label formats on healthiness evaluation and food choice of consumers: a randomized-controlled study. *BMC Public Health*. 2009;9(1):84.
51. Kelly B, Hughes C, Chapman K, Louie JCY, Dixon H, Crawford J, King L, Daube M, Slevin T. Consumer testing of the acceptability and effectiveness of front-of-pack food labelling systems for the Australian grocery market. *Health Promotion International*. 2009;24(2):120-9.
52. Thorndike AN, Riis J, Sonnenberg LM, Levy DE. Traffic-light labels and choice architecture: promoting healthy food choices. *American journal of preventive medicine*. 2014; 46(2):143-9.
53. Mackey MA, Metz M. Ease of reading of mandatory information on Canadian food product labels. *International Journal of Consumer Studies*. 2009;33(4):369-81.