Does the current Scope of nutrition labelling provided in the Saudi markets cope with the increasing trend of chronic disease?

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Research

Keywords: Hydrogenated fat, transfat, Food labeling, nutritional facts, prepackaged food, Food reformulation

Posted Date: February 11th, 2020

DOI: https://doi.org/10.21203/rs.2.23201/v1

Abstract

Background: With increased demand for prepackaged food, the nutrient content of those products has increased especially fat, sugar, and sodium. We aimed to assess the compliance of nutritional labeling and to analyze the stated nutritional components as presented on prepackaged food products in Saudi market.

Methods: A total of 1153 foods were randomly sampled from fourteen stores. Nutritional information was taken from nutrient declarations present on food labels and assessed through a comparison of mean levels and assess compliance with Saudi Food and Drug Authority regulations.

Results: Overall, of the total number of products surveyed, 88% displayed nutritional facts, while 12% did not. Of the total products that had nutritional facts, only 38% met SFDA requirements while 97% disclosed the four key nutritional elements (energy, carbohydrate, protein and fat). In total, almost one third of the products had a high fat content, 40% were high in sugar and 20% were high in Sodium. We found also, 20% listed hydrogenated fat in their ingredient information, 90% of which was fully hydrogenated, while 10% was partially hydrogenated.

Conclusion: There was a high percentage of products that displayed nutritional facts, but only a small percentage complied with SFDA's recent regulations. Food reformulation could have an extraordinary potential to overcome the increase in nutrition-related chronic disease in Saudi Arabia, and the information acquired from this paper provides an overview of thinking about the food supply as a major source needed for a national intervention.

Introduction

Nutrition labels on prepackaged foods are a cost-effective population-level intervention that could be used as a strategy to enable consumers to manage their intake. Accurate and easy-to-understand nutrition labeling is a worthy public health goal that should be considered as an important strategy among many in addressing obesity and poor diet [1]. Improvements in nutrition labeling could make a small, but important, contribution towards making the existing point-of-purchase environment more conducive to the selection of healthy alternatives [2]. The Saudi population has increased its demand for prepackaged foods in recent years, and reports show that Saudi Arabia now imports more than $5 billion each year in food products [3]. With increased demand for prepackaged food, the nutrient content of those products has increased, and tragically, many of these foods contain large amounts of energy, fat, sugar, and sodium. There is an association between high intake of sugary foods, soft drinks, excess sodium intake and trans fatty acids with increased prevalence of obesity, cardiovascular diseases, and mortality [4-6]. The speed of dietary changes has resulted in major shifts in obesity and non-communicable disease rates in in Saudi Arabia [7]. These progressions result in an earnest need to ensure the nutritional quality of prepackaged food in the country. The absence of known published information about the nutritional healthiness of prepackaged foods in Saudi Arabia and the use of hydrogenated fat in these foods has been the imperative explanation behind the writing of this paper. Critically, dietary factors are associated with 6 of the 10 leading causes of death in Saudi Arabia, including ischemic heart diseases, chronic kidney diseases, diabetes mellitus, and hypertension [7].

Governments play an important role in regulating the food industry due to the potential impact on the quality of life of both individuals and the population [8]. In 2013, the Saudi Food and Drug Authority (SFDA) declared its enforcement of the implementation of the Cooperation Council for the Arab States of the Gulf regulation to disclose the nutritional data on food product labels, which were issued in 2012 [Gulf Standard Organization (GSO) 2233/2012]. In 2015, the Gulf Standard Organization approved a technical regulation to enforce producers to disclose the trans-fat content in food products. The nutritional data to be printed on the label of the product are calories, carbohydrates, sugars, protein, fats, trans-fats, sodium, and any component that may affect the product’s nutritional value or individual health or safety (8). The aim of this study was to assess the compliance of nutritional labeling and to analyze the stated nutritional components as presented on prepackaged food products in Saudi market.

Methods

A survey was conducted on the Riyadh market from November 2016 to January 2017 after approval from the Institutional ethical committee (KAIMRC; # SP 16/070/R). Established methods from previously published studies were used [9–11]. Food chains were selected, food was categorized, and data from labels and packages were collected.

Food chains selection

To ensure coverage of all imported and local products sold in Riyadh, nine major food chains representing the largest retail brands, and five neighborhood grocery stores from the five regions of Riyadh—North, South, Central, West, and East—were selected for the purpose of this study.

Food categorization and selection

Products were categorized into groups using the Codex food classification system [12]. These groups were further recategorized into food subgroups based on their placement in sections in stores. The categories were beverages, bakery products, canned foods, cereals and cereal products, confectionery, convenience foods, dairy products, fruits and vegetables, sauces, spreads and snack foods. From each food subgroup, a minimum of three and a maximum of 10 were randomly selected for this investigation. A minimum of 36 and a maximum of 120 food items were sampled from each store.

Data collection

All information was entered into a data sheet for each product, with no identifiers linking the product to manufacturers or food chains.

For each packaged product, the collected data comprised product name, category, origin, nutritional facts (format, language, appearance, portion by 100 g/ml, % DV, energy, carbohydrate, sugar, protein, fat, saturated fat, trans fat, sodium), and ingredients availability. We identified products that contained hydrogenated fat by the presence of the words “hydrogenated” in the ingredient list.

The following types of products were excluded from sampling: unpackaged foods, baby and infant foods and beverages, and small unit packages (the largest surface area was less than 10 cm^2), as these do not require mandatory labels. Each product was only recorded once, even if it was available at multiple supermarkets, unless the product was marketed as a different brand.

Data analysis

All variables were recorded in a spreadsheet for analysis. Later, the products were classified into low, medium, and high levels of fat, sugar, and sodium based on the Food Standards Agency of the United Kingdom, which was developed from the European Union Nutrition and Health Claims Regulations legislation (EC1924/2006) [13]. All analyses were conducted in Stata version 13.0, a p-valus of < 0.05 was considered for statistical significance.

Results

Compliance to the SFDA nutritional facts requirements

Overall, of the total 1153 products surveyed, 88% displayed nutritional facts, while 12% did not. There was a statistically significant relationship between the presence of nutritional facts and the origin of the product, and whether it was local or imported ($p<0.001$). While there was no standard format, only 4% of all products displayed nutritional information on the front of the product. In terms of language, 54% of the displayed information was in Arabic, 84% was in English, and 10% in another language. For portion size, 60% was specified as g/ml and 42% by portion size. If the serving size was specified by portion, 92% of the surveyed packages specified the portion size.

Completeness of nutritional facts by nutrient disclosure and origin

Of the total products that had nutritional facts, only 38% met the Saudi Food and Drug Administration requirements for nutritional information (energy, protein, carbohydrate, sugar, total fat, saturated fat, trans fat, and sodium). Approximately 97% of the products disclosed no more than four key nutritional elements (energy, carbohydrate, protein, and fat). Among the missing nutrients, trans-fat was the most frequently omitted (54.5%) from the nutritional facts, followed by sugar (20%) and sodium (16%). The incidence of other nutrients missing from the documented nutritional facts was less than 2.5%. Imported products showed a higher level of compliance with nutritional facts documentation by 38% compared with local products; only 24.5% of local products complied with SFDA requirements (Table 1).

Average nutrient level in food categories:

The mean energy content (492 Kcal) was highest in snacks, followed by confectionary and bakery products. For sugar, the mean content (35g) was highest in confectionary. The protein content was high (19g) in canned food, while the fat content was highest (25g) in snacks. The saturated fat content was high in snacks, confectionary, and bakery products, while trans-fats were high in confectionary and snacks (0.6 and 0.4 g; respectively). For sodium, the highest (909g) content was in sauces and spreads; as seen in table 2.

Fat, sugar, and sodium across the food categories

Almost one third (34%) of the products had a high fat content, 40% were high in sugar, and 20% were high in sodium. Of all categories, snacks had the highest proportion of fat (76%), followed by confectionery (56%) and bakery products (51%). Confectionery had the higest proportion of sugar (76%), followed by beverages (59%) and bakery products (47%). Sodium content was the highest in snacks (45%), sauces, and spreads (42%).

Hydrogenated fat content

Of the 1143 products that presented information on ingredients, 20% listed hydrogenated fat, 90% of which was fully hydrogenated, while 10% was partially hydrogenated. From the 228 products that had hydrogenated fat, 67.5% were imported, while 32.5% were locally produced. There was no significant association between origin of product and hydrogenated fat content ($P = 0.919$). However, there was a significant difference between product type and content of hydrogenated fat ($P \leq 0.001$). The highest proportion of hydrogenated fat (56%) was found in confectionary products, followed by bakery products (52%). No more than 5% of the sampled products contained hydrogenated fat specified as trans-fat; 5% listed “0 grams” of trans-fat in their nutritional facts and the remainder had no mentioning of trans-fat.

Discussion

A high proportion of the sampled products in this study displayed nutritional facts. Despite this fact, the Saudi Food and Drug Administration published a report in 2018 showing that 55% of the Saudi population do not read food labels and 56% do not know the correct meaning of a portion size. Apparently, the absence of a standard label format makes it more difficult for consumers to read and compare nutritional facts between products. Therefore, a standard label format will provide a great opportunity to guide the population in choosing healthier products. Language is also a significant barrier for reading nutritional labels, as only half of the information was printed in Arabic (the official and spoken language in the country) and a small fraction of the products had the nutrition label on the front the package. Contrary to this lack of good practice in the Saudi Arabian food industry, almost half of the European products have their nutritional labels on the front of the package [10]. It has been documented in the literature that front-of-package nutrition labeling is more likely to be viewed by consumers, compared with rear nutrition panels [14].

Despite the high percentage of products that displayed nutritional facts, only a small percentage complied with SFDA’s recent regulations. Compared with other countries, compliance with SFDA’s regulation is inferior to what has been reported for other countries’ compliance with their own standards of reporting nutritional facts such as India [15], Serbia [16], and China [17].

Higher compliance with reporting regulation for imported products compared with local products could be because of strict regulations for importing into Saudi Arabia. All products imported into Saudi Arabia should be registered and approved before being allowed to cross the border[15]. Most surveyed products in this study contained more nutrients than are needed by the living human body daily. Excess intake of sugar, fat, and sodium has been linked to an epidemic of diet-related diseases such as obesity, diabetes and hypertension, which have been considered leading causes of morbidity and mortality in Saudi Arabia [16]. Locally, the SFDA launched the strategic plan for healthy food in Saudi Arabia as part of the 2030 vision. It includes reducing sugar, salt, and fat contents in prepackaged foods in addition to advice which includes sugar declaration, nutritional facts, and limiting the use of hydrogenated fat [17].

Similar to a study conducted in Canada [11], the results of this study showed that prepackaged confectionary products are the most sugar-dense food on the Saudi market. High amounts of sugar were also found in bakery and cereal products. It is hard to tell if the sugar content in the sampled products is a natural content of the food product or an added ingredient, since at the time of collection of data for this study, sugar content was not a mandatory declaration for labels on packaged food in the country. The proportion of products with high sugar contents were about 40% of the total products analyzed. There is no available data about the consumption of sugar by the Saudi population. One report by Euromonitor International placed Saudi Arabia as number 9 in the world in the consumption of soft drinks at 89 liters per capita, meaning that Saudis consume at least 26 g of free sugar daily from soft drinks only [18]. Excess intake of sugar is associated with an increased rate of obesity, non-communicable disease risk, and dental caries. The intake of free sugars is supposed to be less than 10% of total energy intake based on WHO recommendations [19]. On the other hand, the Saudi government started enforcing taxes on soft drinks and energy drinks in April 2017, which will have a long-term effect on lowering consumption of sweetened beverages [20].

The average sodium level in prepackaged foods varied widely with remarkable differences in the mean level between food categories. More than half of the total products analyzed have high or medium sodium contents that exceeded the daily intake limits. The sodium content was the highest in snacks and sauces and spreads. Within each food category, our results were similar to those of other countries. Similar to products in the United States market [23], sauces and spreads displayed the highest sodium content. Excess sodium intake is the second dietary factor for numerous diseases worldwide [5]. In this study, surveyed bakery products showed a low mean sodium content, thus complying with the recommendation of the SFDA for less than 1 gram for each 100 grams for any type of bread [21].

Sodium reduction regulations have been effective in controlling the normal salt consumption of populations and are considerably more powerful than only instructing people about the need to reduce salt intake [22]. In Canada, a targeted 16.2% significant reduction in sodium levels with a 25% decrease in products with high sodium levels was achieved after a national sodium reduction strategy [23]. New Zealand and the UK also have similar successful strategies to decrease salt in prepackaged food [24, 25].

The 2015–2020 Dietary Guidelines for Americans recommended consuming less than 2,300 mg of sodium each day. In Saudi Arabia, one study measured the adult intake of salt as 3220 mg per day, which exceeded the recommended daily intake [26].

Our survey demonstrates that industrial use of hydrogenated fat is common in the Saudi market, particularly in some food categories. These results are concerning since trans-fats are harmful to the body, particularly regarding the advancement of dyslipidemia and CVD. [15] A systematic review of 32 articles indicated that trans-fat bans would reduce heart disease risk. [27]

Recognizing the trans-fats in any products could be difficult for consumers since the names vary and, accordingly, prevent them from eliminating this sort of fat from their diet. In addition, manufacturers are permitted to label products containing between 0 and 0.5 g of trans-fats per serving as “0 grams” in Saudi Arabia, the United States, and Codex [28]. Decreased use of trans-fats in the Saudi market is conceivable yet banning these fats has not been accomplished; nearly two out of 10 prepackaged food products contain hydrogenated fat.

A main limitation of this study is that the accuracy of the nutritional facts displayed on food labels was not validated by laboratory analyses of content. Similar studies conducted in other countries have shown good correlation between data on the label and the results of chemical analyses [29, 30].

Conclusion

With an increasing demand for prepackaged food, at least half of the surveyed products in this study exceeded the limits allowed for sugar, fat, and sodium. The SFDA should play a major role in controlling companies' use of standard level of nutritional contents, mainly those known to be an overwhelming hazard. Food reformulation could have an extraordinary potential to overcome the increase in nutrition-related chronic diseases in Saudi Arabia. More studies are needed in the future to measure the effect of healthy food strategy interventions and the level of reduction that could be achieved.

Declarations

Authors' Contributions

HJ conceived the project idea, designed the study, approved the methodology, data analysis, and writing and editing the manuscript. AM participated in the data collection and managed the study data. AB participated in the data analysis, and writing and editing the manuscript. All authors contributed extensively towards the preparation of this manuscript and approved the version submitted to the journal. All authors read and approved the final manuscript.

Ethics approval and consent to participate: Institutional Review Board at King Abdullah International Medical Research Center (KAIMRC; # SP 16/070/R), Saudi Arabia has provided ethics approval for this study.

Consent for publication: Informed consent was obtained from all participants.

Competing Interests: The author declares no competing interests.

Availability of data and materials: Please contact the author for requested data.

Funding: This study has not received any funding.

Acknowledgement: Not applicable

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Tables

Table 1. Proportion for local and imported products meeting SFDA for nutrient declaration

	Local products (%)	Imported products (%)	All products (%)	P values (local vs imported)
Energy	370 (98)	772 (99)	1142 (99)	0.0994
Protein	361 (96)	765 (98)	1126 (98)	0.217
Carbohydrate	369 (98)	767 (99)	1136 (99)	0.4115
Sugar	258 (69)	670 (85)	928 (80)	<0.0001
Total fat	370 (98)	769 (99)	1139 (99)	0.3961
Saturated fat	295 (79)	670 (86)	965 (84)	0.0022
Trans fat	159 (42)	367 (47)	526 (46)	0.1574
Sodium	270 (72)	693 (89)	963 (84)	<0.0001

Table 2. Nutrient content for 1153 labelled foods across 10 major food groups (mean & SD).

Food Category	No. of products included in analysis*	Nutrient level Mean, SD for each nutrient							
		Energy Kcal/100 g	Carbohydrates g/100 g	Sugars g/100 g	Protein g/100 g	Fat g/100 g	Saturated fat g/100 g	Trans fats g/100 g	Sodium mg/100 g
Beverages	107	63 (5.97)	15 (1.08)	12 (0.57)	1 (0.19)	3 (2.14)	0.4 (0.24)	0.0 (0.00)	52 (20.7)
Bakery wares	115	421 (10.8)	60 (1.47)	20 (1.5)	8 (0.39)	17 (0.88)	8 (0.61)	0.4 (0.27)	446 (47.3)
Canned food	45	198 (18.8)	5 (1.88)	2 (1.13)	19 (0.87)	16 (4.7)	7 (4.44)	0.0 (0.00)	767 (226.8)
Cereals and cereal products	163	349 (23.4)	62 (2.03)	15 (1.16)	8 (0.32)	7 (0.57)	2 (0.24)	0.0 (0.00)	375 (31.9)
Confectionery	102	428 (10.9)	62 (1.74)	35 (2.24)	6 (0.64)	18 (1.22)	9 (0.75)	0.6 (0.38)	431 (99.4)
Convenience foods	73	254 (15.0)	27 (1.97)	7 (1.27)	10 (0.59)	11 (0.72)	4 (0.59)	0.1 (0.12)	611 (76.1)
Dairy products	133	193 (12.2)	8 (0.86)	7 (0.86)	8 (0.69)	13 (1.15)	7 (0.95)	0.0 (0.00)	594 (84.7)
Fruits and vegetables	68	141 (15.5)	27 (2.97)	18 (2.69)	2 (0.73)	3 (1.02)	1 (0.69)	0.2 (0.19)	529 (164.4)
Sauces and spreads	108	271 (21.4)	21 (2.03)	13 (1.79)	5 (0.81)	19 (2.17)	4 (0.49)	0.0 (0.00)	909 (89.9)
Snack foods	97	492 (20.5)	60 (1.61)	5 (0.89)	7 (0.59)	25 (1.04)	11 (1.96)	0.4 (0.26)	827 (84.6)

Table 3. The proportion of products with low, medium and high, fat, sugar and sodium in different food categories in Saudi markets

p	Fat			Sugar			Sodium		
	Low	Medium	High	Low	Medium	High	Low	Medium	High
rages	95 (93)	02 (02)	05 (05)	03 (04)	30 (38)	47 (59)	71 (96)	02 (03)	01 (01)
ry wares	12 (10)	44 (38)	59 (51)	30 (28)	27 (25)	51 (47)	59 (53)	49 (44)	04 (04)
ed food	05 (12)	31 (72)	07 (16)	26 (90)	02 (07)	01 (03)	01 (03)	33 (92)	02 (06)
ıls and cereal ıcts	75 (46)	75 (46)	13 (08)	61 (40)	47 (31)	46 (30)	73 (48)	61 (40)	18 (12)
ectionery	16 (16)	28 (28)	57 (56)	13 (15)	08 (09)	68 (76)	52 (61)	24 (28)	09 (11)
enience foods	09 (12)	52 (71)	12 (16)	28 (67)	11 (26)	03 (07)	15 (27)	29 (52)	12 (21)
products	25 (19)	41 (31)	66 (50)	20 (24)	50 (60)	13 (16)	51 (60)	08 (09)	26 (31)
s & vegetables	56 (85)	06 (09)	04 (06)	27 (47)	12 (21)	19 (33)	39 (63)	11 (18)	12 (19)
es and spreads	46 (43)	17 (16)	44 (41)	38 (43)	34 (38)	17 (19)	18 (18)	39 (39)	42 (42)
k foods	02 (02)	21 (22)	74 (76)	59 (75)	17 (22)	03 (04)	17 (19)	32 (36)	40 (45)
	341 (34%)	317 (32%)	341(34%)	305(34%)	238(26%)	367(40%)	396 (47%)	288 (34%)	166 (20%)