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What is the nutritive value of commonly consumed processed foods and snacks available in the online market in India?

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ABSTRACT

Processed foods are used across the world and there are country-specific regulations for health and quality. India also has regulations that mandate manufacturers to display the nutritive value of food products. Our objective was to estimate the nutritive value of 'ready-to-eat' foods and foods that need minimal preparation (pre-cooked/frozen) or no preparation available in the online market in India. A cross-sectional survey of all the processed food items available in the online market was done during April – May 2020. These were operationally classified as baked products, beverages, breakfast cereals, heat-and-eat products, pasta-noodles, snacks, and soups. The nutritive value as mentioned on the food labels were noted from 398 such products; baked products (49), beverages (84), and breakfast cereals (44), heat and eat products (55), pasta and noodles (39), snacks (87) and soups (40). Breakfast cereals and heat-and-eat products had the best balance of calories, proteins, and fats. Median energy was 386.9 Kcalories (IQR: 25.6), 8.3g proteins (IQR: 2.6), and fats 4.2g (IQR: 4.9) in the breakfast cereal whereas the heat and eat products per 100g had a median of 344 kcal (IQR: 205), 8 g protein (IQR 5.3) and 6g (8.4) median fat. The highest fat content was in the snacks with a median of 23.3g (median: 21.6) with the highest up to 38g. Transfats levels were missing in 86 (21.6%) products. Sodium levels were missing in 215 (54%) products. Initiatives for healthy processed foods and appropriate labeling will aid consumers to make an informed decision while purchasing these products from the market.

1. INTRODUCTION

Like many low and middle income countries, nutrition transition is underway in India [1]. There is a change in consumption patterns where a traditional diet based on home-cooked foods with unprocessed cereals and legumes, vegetables, and fruits is being replaced by highly processed and packaged products. This is partly due to rapid urbanization and industrialization [2]. This has also contributed to increasing hypertension and

diabetes and increasing diseases related to poor nutrition including overweight-obesity, undernutrition, and micronutrient deficiency [3]. There is also changing trend in grocery shopping practices with wider presence of supermarkets and increasing online shopping that promotes unhealthy food choices [4]. Online shopping has received further impetus due to the COVID-19 pandemic related restriction of movements [5]. Moreover, the understanding and reading of food labels is low and its understanding is at times deficient in terms of the numbers, the language and the terminology. [6]. The objective of the present study was to estimate the nutritive value of 'ready to eat' foods and foods that need minimal preparation (pre-cooked/frozen) or no preparation available in the online market in India.

2. Materials and methods

All the processed food products available on online grocery sale platforms in India and available during the period of April to May 2020 were included in this cross-sectional survey. We included products that were 'ready-to-eat' foods, or requiring minimal (pre-cooked/frozen) or no preparation. Operationally we identified these processed foods as those that undergo one or more of a range of operations, including "washing, grinding, mixing, cooling, storing, heating, freezing, filtering, fermenting, extracting, extruding, centrifuging, frying, drying, concentrating, pressurizing, irradiating, microwaving and packaging" [7]. We excluded products that were minimally processed foods, foods processed to help preserve and enhance nutrients and freshness, like washed and packed fruits, vegetables, milk additives, pickled and canned foods, baby foods, pureed foods, sauces and dressings. Foods were classified as baked products, beverages, breakfast cereals, heat and eat products, pasta and noodles, snacks and soups. Two reviewers independently classified of these food items and any conflict in identification of the right classification was resolved by the third reviewer. The food labels with information on calories, proteins, fats were assessed. Nutritive values were given as per 100mg or 100ml of the product and per serve percentage contribution to RDA [8]. Since there were no human participants, an exemption was obtained from the Institutional ethics committee. Data collected were entered in Microsoft Excel and analysed using SPSS Version 23 and descriptive statistics was used to describe the nutritive values.

3. Results

We collected information on a total of 398 products. These products were classified as shown in the figure 1.

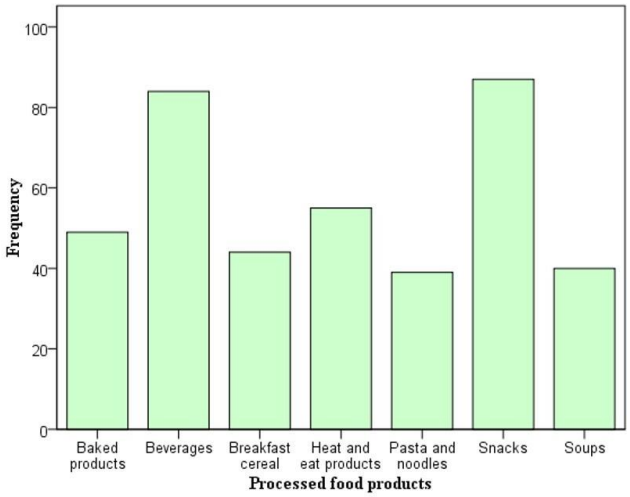

Figure 1: Types of processed food products available in the online grocery market

The nutritive values of the products assessed are (Figure-2, 3 and 4). The baked products had low protein

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content (median: 6.2, IQR: 2.7) second only to the soups (median: 2.8, IQR: 4.3). Beverages had a mean caloric value of 54 Kcal per 100 (median: 52, IQR 17) with no other significant nutritive value. Breakfast cereals and heat hand eat products had the best balance of calories, proteins and fats). Median energy was 386.9 Kcalories (IQR: 25.6), 8.3g proteins (IQR: 2.6) and fats 4.2g (IQR: 4.9) in the breakfast cereal whereas the heat and eat products per 100g had median 344 kcal (IQR: 205), 8 g protein (IQR 5.3) and 6g (8.4) median fat. The highest fat content was in the snacks with median of 23.3g (median: 21.6) with highest up to 38g. Transfats level were missing in 86 (21.6%) products. The maximum transfats were found to be in pasta and noodles, being 7.2 per 100g. Sodium levels were missing in 215 (54%) products and the maximum sodium was 9.6g noted in pasta and noodles (100g).

Table 1: Energy, protein and fat content of processed food products in online grocery market

Category of the processed food	Median Calories in Kcal (IQR)	Median Protein in gram (IQR)	Median total fat in gram (IQR)
Baked products	485.0 (30.5)	6.2 (2.7)	20.2 (6.3)
Beverages	52.0 (17.4)	NA	NA
Breakfast cereal	386.9 (25.6)	8.3 (2.6)	4.2 (4.9)
Heat and eat products	344.0 (205.0)	8.0 (5.3)	6.0 (8.4)
Pasta and noodles	379.1 (91.0)	9.6 (3.8)	0.03 (0.12)
Snacks	497.6 (114.5)	7.1 (6.3)	23.3 (21.6)
Soups	327 (116)	2.8 (4.3)	5.5 (9.1)

IQR = Interquartile range

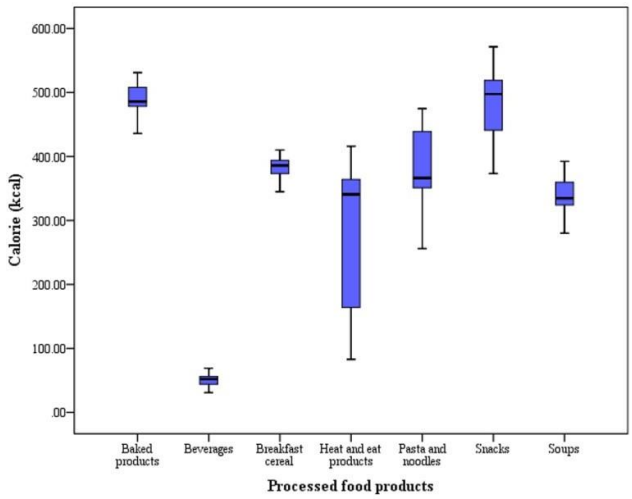

Figure 2: Caloric content of processed foods available in online grocery market

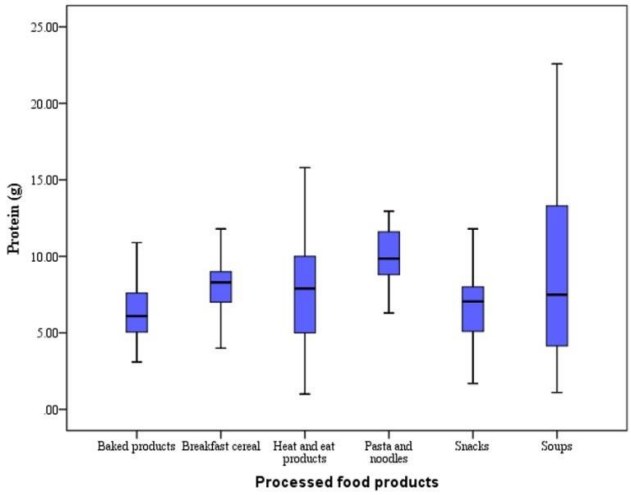

Figure 3: Protein content of processed foods available in online grocery market

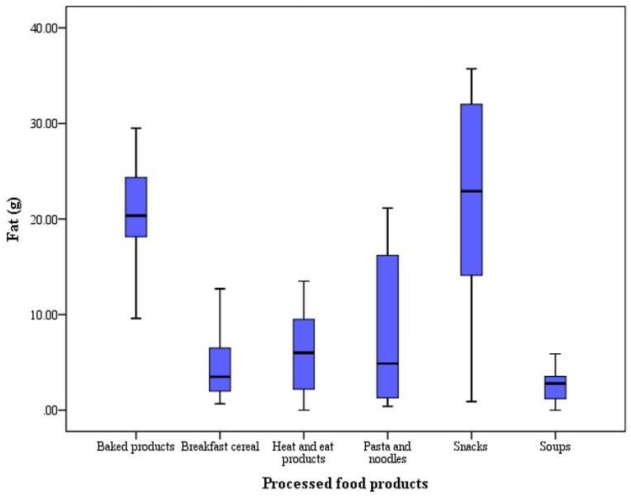

Figure 4: Fat content of processed foods available in online grocery market

4. Discussion

We assessed the nutritive value of 398 processed food items in the online market in India. We found that most of the processed foods have high calorie content and beverages had the worst nutritive values among all the products that were surveyed in this study. The presence of high calories, low fibre, negligible availability of proteins and the possibility of either high sugar or salt in most beverages are likely to be harmful in terms of nutrition at population level. Wide availability of unhealthy packaged food and beverages is an important factor in rising overweight and obesity in India [2]. When healthiness of packaged foods sold in India were ranked using Australian Health Star Rating (HSR) and World Health Organization's European Regional Office Nutrient Profile Model, the overall healthiness was found to be low (HSR 1.8/5.0) with the need to make processed foods healthier was clearly identified [2]. Beverages lack all essentials nutrients except calories, which was notably high in our study. The wealthier states in India were found to purchase more soft drinks as compare to middle and low- income state [10]. As per a meta-analysis there was a clear association of soft drinks and increased energy intake and body weight. Moreover, it leads to poor intake of milk, calcium and other nutrients. The same meta-analysis also reported that the research driven by the industry underreported the unhealthy effects than the non-industry funded studies [11]. According to an extensive systematic review of published and grey literature, dietary patterns in high- fat, high-sugar foods were identified in India and the consumers of more of these foods were also

more likely to have higher body weights [12]. In a multicenter study called The India Health Study, while westernized diet was not found, dietary pattern with more of animal products, fried snacks, or sweets was highly prevalent and had positive association with abdominal obesity [13].

Indian government has a Food Safety and Standards Authority of India (FSSAI) that has provided definitive regulations for nutrition labelling for the processed foods so as to include energy, proteins, carbohydrates and fat per 100g or 100ml serving [14]. Lack of sodium content labelling in more than half of the processed foods in our survey was a point of concern. According to a large survey of packaged foods from 11 retail chains in two major cities in India, only 32% (1812/5686 products) had sodium content in the food label with no evidence that the processed foods in India were becoming less salty [15]. Here it was found that there was a mean increase in sodium content in four groups of processed food items like cereals (+30%), dairy products (+99%), non-alcoholic beverages (103%) and in sauces-spreads (+50%) and a decrease in the level was noted in none. In our study it was observed that although total fat levels were mentioned in all the products, they were not classified as saturated, unsaturated and transfat in many of the products. Their percentage/proportion is important from recommended dietary allowances and balanced diet point of view. The Food Safety and Standards Authority of India (FSSAI) plans to reduce the transfats content in all oils and fats to <2% by the end of 2021 [14]. The use of transfats however continues to be high in processed foods and mandatory labelling is the most important strategy to achieve this goal [16]. Countries follow different front of pack labelling in processed food products all over the world like health star rating (Australia, New Zealand), Multiple traffic lights (UK) etc which gives an idea about the healthiness of the food product [17]. But, in India there is no such labelling for processed food in place. This is mainly as industries are not willing to accept it because it will become difficult for them to meet the criteria and also negative labelling will hamper their market share. All segments of the food system that is agriculture and food scientist, food industry, grocers, food service, public health professional, media, government and the consumers have a role to play in ensuring that processed food contributes to healthy diet. Consumers should be educated regarding the importance of healthy eating habits and media can help by promoting healthy food products. Food scientists can find out innovative methods by which consumers will not lose the pleasure of eating junk and at the same time it will have all the essential nutrients in it.

5. Conclusion

While analysing the nutritive value of processed food, it was obvious that processed food is an important part of Indian diet. Processed foods have two roles, food security (ensuring that sufficient food is available) and nutrition security (ensuring that food quality meets human nutrition needs) and latter has a long way to get achieved as per our study. Nutritive values of all the processed food products available in the Indian market vary widely in terms of calories, proteins and fats. Our analysis found that the beverages had high calories with no other nutritive value. Sodium content and transfats are important components of the food labels that are suboptimal.

6. Financial support

Nil.

7. Conflicts of interest

There are no conflicts of interest

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