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Abstract

Food labelling is an essential feature for food product marketing and is mainly regulated by national food authority. Food package labelling provides information on product composition, usage instructions, shelf-life safety, storage conditions, and nutritional profile. The purpose of this study is to review the scope of the current food labelling system used in local food products. We surveyed 3 different food categories: 1) processed meat products, 2) bread, and 3) snacks, and examined the nutritional labelling criteria with respect to the carbohydrates, protein, and particularly sodium (salt) content. A broad market survey was carried out across Brunei and Muara district, collecting data on 99 processed meat products, 77 bread products, and 73 snack products. The major findings revealed that many of the chicken and beef items (36% and 37%, respectively) were unlabelled and only 6% and 4% of labelled chicken and beef products (respectively) had sodium content statement found on their labels. In addition, we found that majority of the seafood products and bread loaf products were not labelled at all, and the snack products were only 10% labelled. These findings emphasised Brunei Darussalam's lacking an obligatory regulatory system for food product labelling.

Keywords: Non-communicable diseases, Food product labelling, Customer market, Food supply chain, Healthier choice logo

1. Introduction

Food labelling serves as a necessary bridge between the food sector and customers, giving vital nutritional information, component composition, and potential allergies in addition to expressing essential product information (Perumal et al., 2022). In other words, food labelling enables people to make more educated and healthier dietary choices, particularly when it comes to risk factors for Noncommunicable diseases (NCDs). Labelling encourages consumers to choose options that match with their health goals by raising awareness and allowing them to assess the nutritional composition of food products (Kelly et al., 2009; Perumal et al., 2022). NCDs have become a significant global public health concern in recent decades, imposing a significant burden on individuals, communities, and healthcare systems worldwide (Dans et al., 2011). NCDs, often known as chronic diseases, include cardiovascular disease, diabetes, obesity, and certain cancers (Ruthsatz & Candeias, 2020). The

rise in NCDs can be ascribed to common risk factors such as poor diet, sedentary lifestyles, and cigarette use, all of which have become major contributors to their rising prevalence (Ruthsatz & Candeias, 2020). Among these elements, the quality and composition of the food we eat have a significant impact on our health outcomes (Rahman et al., 2019).

Consumers have increasingly acknowledged the need of adopting health-conscious decisions when it comes to their dietary habits throughout the years. However, many people find it difficult to navigate the complicated landscape of food options, comprehend product labels, and appreciate the true nutritional worth of packaged foods (Perumal et al., 2022). As a result, food labelling is a great tool for closing this knowledge gap, empowering consumers to make better-informed choices that match with their health goals (Martini & Menozzi, 2021; Perumal et al., 2022).

In contrast, the lack of accurate food labelling prevents customers from getting critical information into potential health hazards related with unspecified food purchases (Borgmeier & Westenhoefer, 2009). Consumers may unwittingly purchase items containing dangerous substances or nutritional imbalances if labelling is not clear and explicit, contributing to the rise of NCDs and other health issues (Borgmeier & Westenhoefer, 2009).

One of the most widely consumed food categories globally, including Brunei Darussalam are meat products, especially processed meats. This is due to their convenience, variety, accessibility, and most significantly the taste palatability. Breads are the second widely consumed food products in Brunei after processed meat. Snack products ranked third, especially prominent among children. Given the pervasiveness of snacking in modern society, it is crucial to recognise that snack products are associated with an elevated risk of obesity and cardiovascular diseases (Ainsworth & Plunkett, 2007; Timic et al., 2020).

In Brunei Darussalam, some products with generally low content of total fat, saturated fat, sodium, and sugar carries Healthier Choice Logo with the image of a red circle and a tick (Hj Abdul Manap Othman, 2021), as shown in this link (https://www.moh.gov.bn/SitePages/healthychoicelogo.aspx). One specific part of food labelling that deserves special attention is the salt content. High salt consumption has been linked to several NCDs, including hypertension, cardiovascular disease, and stroke. The objectives of this study to explore the local food product labelling system used currently in Brunei for the processed meat products, bread, and snacks, as well as, to observe the labelling criteria for food product content of fats, carbohydrates, proteins, and sodium (salt).

2. Materials and methods

A market survey was conducted across Brunei and Muara district covering item screening in small to large food product retailers. Information on products labelling were collected for a wide range of products during two-month period, as following:

2.1. Meat products

A total of 11 local processed meat companies were chosen as the subjects of this study, covering 99 various types of processed meats. The selected products were three categories, chicken products (44 types), beef products (46 types) and seafood products (9 types).

2.2. Bread products

A total of 10 local bakeries were chosen for bread products with a total of 77 bread products selected. The selected bread samples were restricted to bread loafs with variety types.

2.3. Snack products

A total of 20 local companies were chosen for snack products with a total of 73 snack product types.

3. Results and discussion

3.1. Labelling of meat products in Brunei market

Fig. 1(A-B) show the percentage of labelled and non-labelled chicken and beef products. 36% (n = 16) of the 44 chicken products and 37% (n = 17) of the 46 beef products were unlabelled which is a relatively high percentage considering chicken and beef are the most prominent product consumption in Brunei Darussalam. Fig. 1(B) and (D) show the percentage of basic important nutritional content in chicken and beef products. Only 6% (n = 5) of the labelled chicken products and 4% (n = 4) of the labelled beef products included sodium content in their labelling system which is a very low amount. Most of the labelling only includes the three most basic nutritional contents which are carbohydrate content, total fat content and protein content.
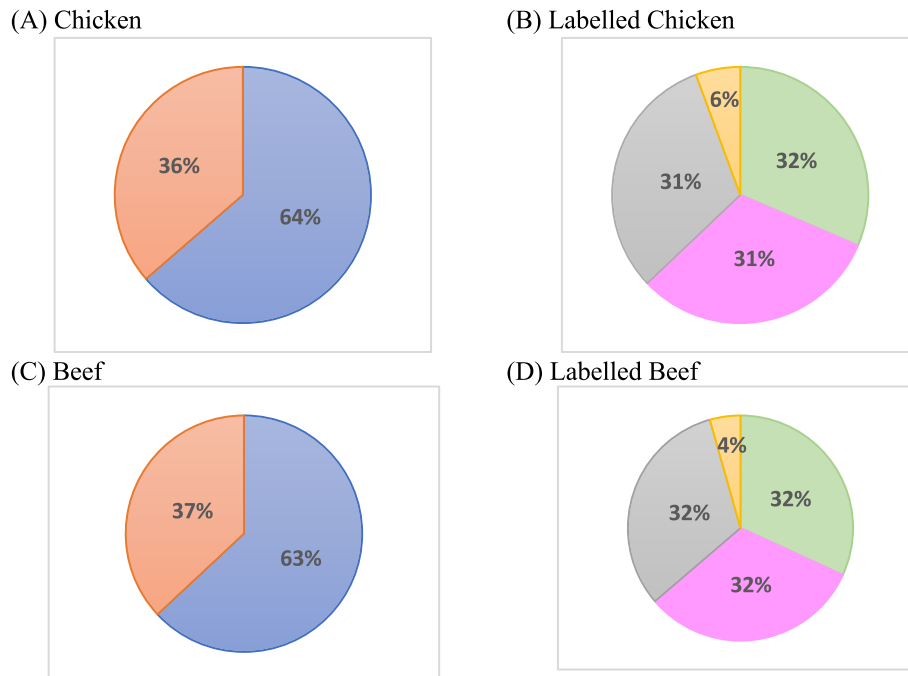
Fig. 1. *Percentage of labelled and non-labelled meat products of chicken products (A) and Beef Products (C). The percentage of labelled meat products with the detailed composition levels (Carbohydrate, Fats, Proteins, and Sodium) for 89 chicken products (B), and for 92 Beef products (D). Colour code: Labelled (Blue colour), Non-Labelled (Orange colour), Carbohydrate (Green colour), Fats (Pink colour), Protein (Grey colour), Sodium (Yellow colour).*

3.2. Labelling of seafood product, bread products, and snack products

Fig. 2(A-B) show that none of the selected seafood products and bread loaf products were labelled. As for snack products, only 10% (n = 7) of the selected products were labelled and 90% (n = 66) were unlabelled as shown in Fig. 2(C). Fig. 2(D) shows the percentage of basic important nutritional content included in the labelled snack products. Based on the result, all labelled products, 25% (n = 7), included sodium content in their labelling.

3.3. Sodium content in labelled meat products & snack products according to WHO and HCL compliance

Fig. 3 (A-F) show the comparison of labelled sodium content in chicken and beef products (A-D) and snack products (E-F) to that of the benchmark given in the 'WHO global sodium benchmarks for different food categories' and 'Brunei Darussalam Nutrient Criteria of Foods and Beverages with the Healthier Choice Logo (HCL).

As indicated in Fig. 3, out of the 6% (n = 5) sodium-labelled chicken products, 80% (n = 4) of them are within the WHO recommended sodium benchmark and only 20% (n = 1) of them are within HCL recommended sodium benchmark as shown in

Fig. 3(A-B). As for beef products, none of the 4% (n = 4) sodium-labelled beef products are within the WHO recommended sodium benchmark whereas 50% (n = 2) of them are within the HCL sodium benchmark as shown in Fig. 3(C-D). Snack products had 14% (n = 1) out of 25% labelled snacks followed both WHO and HCL benchmark requirement as shown in Fig. 3(E-F).

These findings show a weak mandatory system in the labelling requirement for local products in Brunei Darussalam. Chicken, beef, seafood, bread, and snacks are the most prominent types of food in Brunei. Having no label or lack of information will hinder customers to plan their purchase and manage their daily nutritional intake (Cecchini & Warin, 2016).

Food Act in Brunei Darussalam contain detailed structure requirements for labelling food products in Brunei. In general, the information on nutritional facts must include energy, carbohydrates, protein, and fats. Other macronutrients or micronutrients which include sodium (salt) content are still voluntary and are only made mandatory if there is a nutrition claim involved on the products. All details for labelling requirements for each type of products should be referred to chapter 182 in the "PUBLIC HEALTH (FOOD) ACT" (Attorney General's Chambers, 2001). Every packaged or prepacked food in Brunei Darussalam must bear a label on a
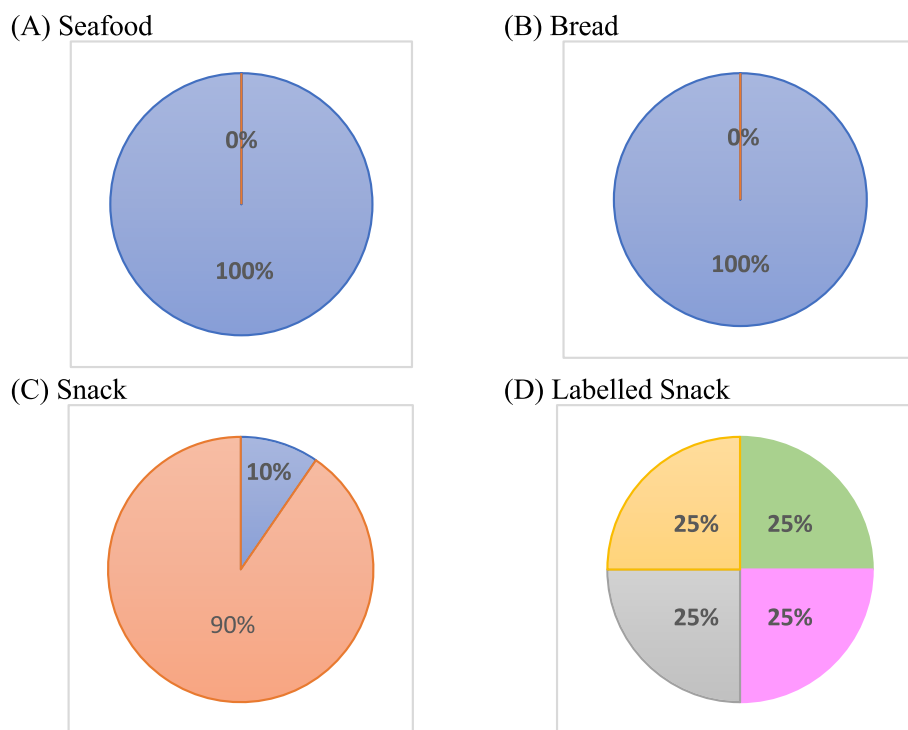
Fig. 2. Percentage of labelled and non-labelled products of Seafood products (A), Bread products (B), and Snack products (C). Percentage of Labelled Components in Snack Products (D). Colour code: Labelled (Blue colour), Non-Labelled (Orange colour), Carbohydrate (Green colour), Fats (Pink colour), Protein (Grey colour), Sodium (Yellow colour).

prominent position on the package containing all the required information in either Malay or English language (Attorney General's Chambers, 2001).

The use of "Healthier Choice" logo plays a very important role in public health programs. When consumers choose items displaying the label on a frequent basis, there is a growing demand for healthier options, and food manufacturers are driven to reformulate their products to meet the criteria for receiving the logo (de Sousa et al., 2020). This can result in fewer unhealthy components and the development of new, healthier goods to match consumer demands (de Sousa et al., 2020). As a result, the "Healthier Choice" emblem serves as a catalyst for good change in the food business, promoting healthier practices and contributing to higher nutritional quality in a variety of food choices (de Sousa et al., 2020).

Apart from using healthier choice logo, incorporating salt-related health warnings on food labels also helps in healthy choice of food by raising consumer awareness of the dangers of excessive salt consumption (Rojas-Rivas et al., 2020). These warnings might act as a reminder to choose healthier options and encourage people to eat lower-sodium diets. In certain countries, successful campaigns have included salt warnings on food labels, resulting in increased consumer awareness and healthier choices (Kumarapeli & Alagiyawanna, 2020; Rojas-Rivas et al., 2020; Zandstra et al., 2016).

It is not easy for consumers to judge whether a food item is 'healthy' or 'unhealthy.' To lower the risk of NCDs, consumers must be knowledgeable enough to choose foods that are appropriate for their health statuses, which is why nutrition education is important for efficient strategy to prevent NCDs.

Enforcing and strengthening the labelling regulation of food products is certainly not enough to achieve overall salt reduction in Brunei Darussalam. Other strategies should also be enforced following the labelling regulation such as taxation and incentives, restaurant and fast-food initiatives, school and workplace programs, healthcare provider involvement, and the use of salt alternatives (Ghimire et al., 2021).

Implementing taxes on high-salt products is one of the proposed solutions to minimise salt intake. This technique seeks to discourage consumers from purchasing salty foods by raising their prices, so pushing them to choose healthier alternatives (Al Jawaldeh et al., 2019). Incentives for food businesses who actively reduce the salt content of their goods can also stimulate collaboration between the
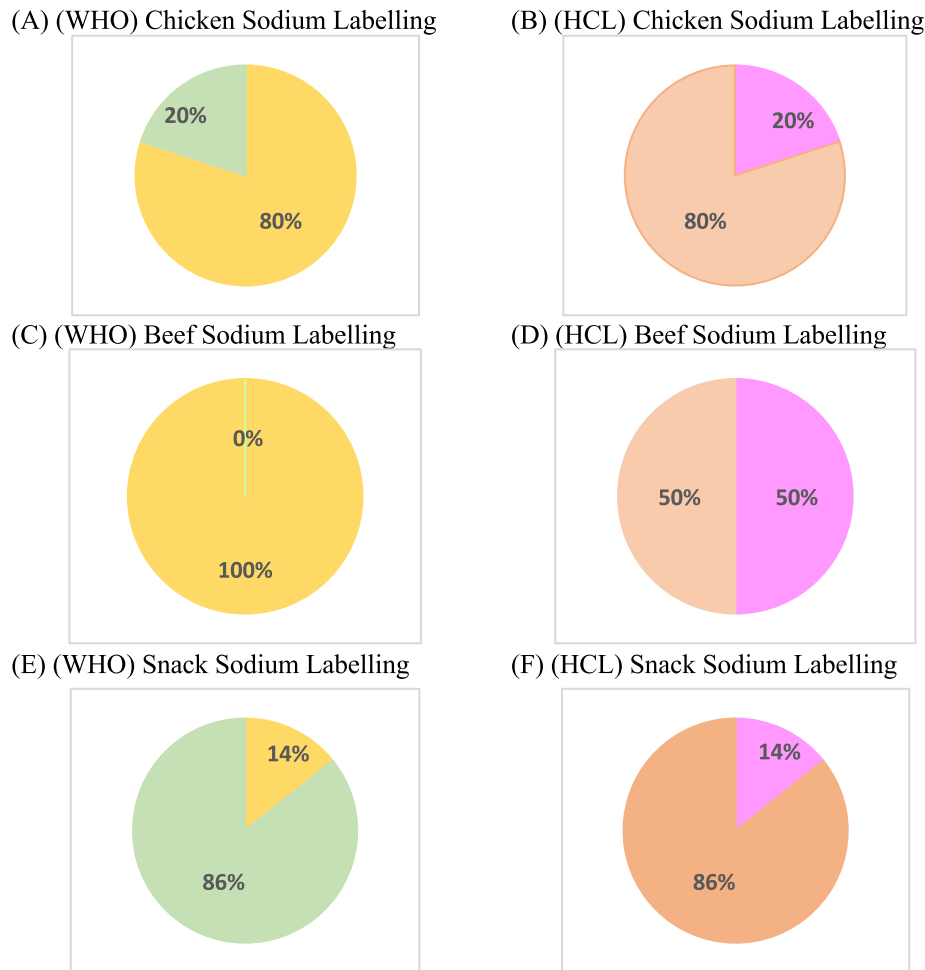
Fig. 3. Percentage of Na content within WHO benchmark for chicken products (A) and beef products (C), and percentage of Na content within HCl benchmark for chicken products (B) and beef products (D). Colour code: Within WHO benchmark (Yellow colour), Beyond WHO benchmark (Green Colour), Within HCL benchmark (Pink colour), Beyond HCl benchmark (Peach colour).

public health and food industries (Michael et al., 2021). Although the effectiveness of taxing as a stand-alone policy is debatable, studies have shown that when paired with other interventions, such as educational campaigns, it can considerably contribute to lowering overall salt consumption (Ghimire et al., 2021; Michael et al., 2021).

Educational programs aimed at schools and workplaces show potential as useful techniques for lowering salt consumption. Individuals are exposed to consistent messaging about the health concerns associated with excessive salt consumption when salt reduction is integrated into curriculum or workplace wellness programs (Webster et al., 2011). These programs can also provide practical advice on how to make healthier food choices and prepare meals with less salt (Huang & Zeng, 2021; Michael et al., 2021). Engaging children and adults in hands-

on activities, such as cooking demos and taste tests with salt substitutes, increases their desire to adopt healthy eating habits in the long run (Al Jawaldeh et al., 2019; Huang & Zeng, 2021).

Doctors, nutritionists, and nurses, among others, play an important role in counselling patients toward better lifestyles. Incorporating salt reduction advice into normal healthcare visits can help raise awareness about the dangers of excessive salt consumption and urge patients to act (Kim, 2020). Furthermore, medical practitioners can adapt their suggestions based on individual health circumstances, dietary choices, and cultural considerations, making them more personalised and realistic (Kim, 2020). Evidence suggests that individuals are more likely to adopt healthy dietary habits when they receive regular and clear messaging on salt reduction from their healthcare providers (Kim, 2020).

4. Conclusions

The finding shows a weak mandatory system on food labelling for local products. A majority of the food products are not labelled and even among the labelled products, most of them do not follow the required benchmarks as stated in 'WHO global sodium benchmarks for different food categories' and 'Brunei Darussalam Nutrient Criteria of Foods and Beverages with the Healthier Choice Logo (HCL)' which is believed to contribute on the raising of NCDs in Brunei Darussalam.

Apart from enforcing regulation and educating civilians on food labelling, other strategies should also be enforced such as taxation and incentives approach to discourage people on buying high salt products and encouraging healthier option, educational programs aimed at schools and workplaces as part of curriculum for lowering salt consumption, and healthcare provider involvement on salt reduction advice in normal healthcare visits to help raise awareness about the dangers of excessive salt consumption and urge patients to take action.

Authors' contributions

AAN conceived the study, carried out the experiments, interpreted the result and drafted the manuscript. AMB, ER, and ZZ reviewing the findings, editing, and contributed to the manuscript. BFN conceptualization, reviewing, writing, and editing, and interpreted the findings. All authors read and approved the final manuscript.

Conflicts of interest

The authors declare no real or apparent conflicting or competing interest regarding the publication of this work.

Acknowledgement

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