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The Health Star Rating System in Australia and New Zealand: A Policy Case Study and Its Implications for Front-of-Pack Nutrition Labelling

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ABSTRACT

This paper examines the Health Star Rating (HSR) system in Australia and New Zealand as a front-of-pack (FOP) nutrition labelling policy, with a focus on its role in improving obesity-related dietary health and its potential applicability in other contexts such as China. While the HSR aims to simplify nutritional information and support healthier food choices, this study suggests that its effectiveness is constrained by both behavioral and structural limitations. The analysis shows that the HSR enhances consumer understanding by providing a simplified summary of nutritional quality and facilitates product comparison within categories. It also creates incentives for manufacturers to reformulate products. However, these benefits do not necessarily translate into meaningful improvements in dietary behavior or weight management outcomes. Consumer misunderstandings, including inappropriate cross-category comparisons and the health halo effect, may distort perceptions of product healthfulness. In addition, the system does not account for portion size or total energy intake, limiting its relevance to obesity prevention. At the structural level, the voluntary nature of the HSR leads to selective labelling, with higher-rated products more likely to display the rating, resulting in a biased information environment. Incomplete market adoption further reduces its population-level impact. The paper suggests that while HSR-type systems may offer useful insights for countries such as China, their effectiveness would depend on adaptation to local regulatory frameworks. Emerging digital and AI-based tools may provide a potential pathway to enhance the system by enabling more personalized and context-specific dietary guidance.

KEYWORDS

Health Star Rating (HSR); Front-of-pack labelling; Obesity; Consumer behaviour; Food policy

1. INTRODUCTION

Obesity has become a major global public health concern. According to the World Health Organization [1], in 2022, 2.5 billion adults were overweight, including over 890 million living with obesity. The global prevalence of overweight among adults has increased significantly, rising from 25% in 1990 to 43% in 2022. In response to increasing obesity rates, a range of weight management strategies, such as increasing physical activity, reducing the intake of calorie-dense foods, and adopting structured dietary approaches, have been recommended. However, their effectiveness relies heavily on individuals making informed and consistent dietary choices in their daily lives [2]. Despite increasing awareness of healthy eating and widespread public health efforts, obesity rates remain high in developed countries such as Australia and New Zealand. New Zealand has the third-highest adult obesity rate among the countries in the Organisation for Economic Co-operation and Development

(OECD), with one in three adults classified as obese [3], while in Australia, 64% of people aged 15 and over live with overweight or obesity, exceeding the OECD average [4].

In many developed countries, consumers now have increasing access to nutritional information through multiple sources. In response, governments and health organizations have introduced nutrition labelling policies to improve their availability and clarity. These policies aim to provide clear and accessible information, enabling consumers to make more informed food choices [5]. However, the persistence of high obesity rates in these countries suggests a more complex issue. The challenge may not lie solely in the absence of information, but in how consumers interpret, use, and act upon that information when making decisions.

Nutrition labelling policies, particularly front-of-pack (FOP) labelling systems, are intended to support consumers in translating nutritional information into food choices by providing clear and accessible guidance at the point of purchase [6]. In addition to improving consumer understanding, such policies may also encourage food manufacturers to reformulate products. Nevertheless, whether these policies effectively translate increased information into meaningful changes in consumer behavior and population-level health outcomes remains an open question. This paper aims to analyze the particular kind of FOP labelling system in Australia and New Zealand, the Health Star Rating (HSR) system, and evaluate its effectiveness and potential applicability in other regions.

2. THE HEALTH STAR RATING SYSTEM

The Health Star Rating (HSR) system is a voluntary FOP labelling system designed to evaluate the overall nutritional quality of packaged foods. The system was introduced in Australia and New Zealand in June 2014 as a joint initiative funded by the Australian federal, state, and territory governments, together with the New Zealand government. It assigns products a rating ranging from 0.5 to 5 stars, offering a simple and standardized way for consumers to compare similar food items. In general, a higher number of stars indicates a healthier choice within the same product category [7].

The HSR system was developed in response to limitations in existing nutrition labelling formats. While most packaged food products already carry a Nutrition Information Panel that provides detailed nutrient information, such panels are often complex and time-consuming to interpret. In contrast, the HSR system aims to simplify this information into a simple summary indicator, allowing consumers to make quicker and more informed decisions at the point of purchase [8].

The HSR system is based on a nutrient profiling algorithm that evaluates both negative and positive components of a food product's nutritional composition. Baseline points are assigned for nutrients associated with higher health risks, including energy (kilojoules), saturated fat, total sugars, and sodium. Higher levels of these components result in higher baseline scores, which lower the final rating. Modifying points are awarded for beneficial components, such as the proportion of fruits, vegetables, nuts, and legumes, as well as dietary fiber and, in some cases, protein content. These positive elements can offset the negative baseline score. The final star rating is calculated by balancing these negative and positive components, using a standardized measure per 100 grams or 100 milliliters. As a result, products that are lower in energy, saturated fat, sugar, and sodium, and higher in beneficial nutrients, receive higher star ratings between 0.5 and 5 stars [9].

3. BENEFITS AND LIMITATIONS OF THE HEALTH STAR RATING SYSTEM

3.1. Potential Benefits of HSR

First, the HSR system enhances consumer understanding by simplifying complex nutritional information into a more accessible format. As a FOP label, it presents information in a way that is

easier to interpret compared to traditional nutrition panels. Anderson and O'Connor [9] demonstrate that FOP labels present more condensed nutritional information in a highly visible format, facilitating quick consumer evaluations of product healthfulness, compared to traditional back-of-pack (BOP) labels, which are not processed deeply and fail to increase consumer knowledge, particularly for consumers with limited nutritional knowledge. Moreover, it also functions as a comparative tool, allowing consumers to identify healthier products more effectively within the same category.

The HSR system also creates incentives for food manufacturers to improve product formulations. In a 2024 consumer survey, New Zealand Food Safety reported that 80% of respondents trusted the HSR system [10]. This suggests that the HSR has become an important influence on consumer decision-making, with higher star ratings likely to increase the perceived healthfulness of products and shape consumer choice.

As consumer preferences shift toward products with higher star ratings, manufacturers face increasing competitive pressure to achieve more favorable ratings through reformulation. This may involve reducing the contents of sodium, sugar, and saturated fat, or increasing beneficial components like dietary fiber in their products. Therefore, beyond its role as an informational tool, the HSR system functions as a market-based mechanism that encourages product reformulation in response to consumer demand and competitive pressure.

3.2. Limitations in Influencing Obesity-Related Dietary Outcomes

Despite these benefits, the HSR system has several limitations in influencing obesity-related dietary outcomes. The HSR is part of a broader public health strategy aimed at improving dietary patterns and reducing the risk of chronic diseases. Official policy frameworks emphasize the importance of maintaining a healthy weight and reducing the consumption of nutrients linked to obesity, such as saturated fat, sugar, sodium, and energy intake [8]. In this context, the HSR is intended to support healthier food choices and contribute to improved population health outcomes. However, despite these objectives, overweight and obesity rates in Australia and New Zealand remain high, suggesting a limited impact of the policy on weight management outcomes. This highlights a gap between the system's public health intentions and its practical impact on consumer behavior and diet-related health outcomes. While the HSR may encourage relatively healthier product choices, such improvements at the product level do not necessarily translate into meaningful changes in overall weight management. This suggests that HSR has a limited ability to address complex issues such as obesity.

The effectiveness of the HSR in improving understanding may also depend on the context in which it is used. If consumers do not habitually consult the BOP nutritional information, it is uncertain whether they can successfully make healthful choices when comparing products with and without an HSR label. This suggests that while the HSR improves information accessibility, it does not always guarantee optimal interpretation in all decision-making contexts. Moreover, consumers often misunderstand how the rating should be used across different product categories. The HSR is designed as a comparative tool for similar products within a category, not for fundamentally different types of foods. However, in practice, many consumers apply it incorrectly. According to the Health Star Rating – 2024 Monitoring Consumer Research Report, 52–72% of Australian consumers and 50–62% of New Zealand consumers did not understand that the rating is not intended to be used to compare dissimilar products [11]. This misunderstanding can lead to misleading perceptions of product healthiness. For example, a chocolate bar with a relatively high star rating may be perceived as healthier than a pack of cereal, even if the cereal is nutritionally more appropriate.

Another limitation is the health halo effect, whereby higher-rated products are perceived as healthier than they actually are. Wang and Begho [12] suggest that nutrition and health claims can distort perceptions of food healthfulness. For instance, claims such as low-fat or zero-sugar may create an illusion of healthiness and cause consumers to underestimate calories. Consequently, consumers may assume permission to eat more, leading to larger portion consumption.

Additionally, the HSR focuses on overall nutrient composition rather than factors directly related to weight management, such as portion size, total energy intake, or consumption patterns [13]. As a result, while the HSR may help identify relatively healthier products within a category, it does not necessarily support effective calorie control or long-term weight management outcomes.

3.3. Structural Limitations of the System

Beyond consumer-level issues, the HSR faces structural limitations. Its voluntary nature allows manufacturers to selectively display the label, causing systematic bias in the products presented to consumers. Evidence from 2018 monitoring data reported in the Health Star Rating System Five Year Review indicates that 77% of HSR-labelled products displayed ratings of 3.0 stars or above, with a median rating of 3.5 [14]. This is likely driven by commercial incentives, since displaying ratings on less healthy products may negatively influence consumer perceptions.

The system is primarily based on nutrient composition and does not directly consider the degree of food processing. Consequently, some ultra-processed products can still achieve relatively high ratings if they are formulated to reduce sugar, saturated fat, or sodium, and/or increase fibre or protein, potentially giving a healthier appearance than warranted. The George Institute for Global Health [15] modified the algorithm by deducting or capping points for ultra-processed foods classified by the NOVA food classification system. After reassessing 25,486 products, the modified algorithm assigned lower ratings to many less healthy products, with notable examples including protein bars, sugary cereals, refined breads, and diet soft drinks, while improving alignment with the NOVA classification from 66% to 88%.

Even when nutritional information is available, consumer behaviour may not align with health recommendations. Factors such as taste, price, and convenience continue to influence purchasing decisions. Moreover, broader environmental factors, including marketing, product pricing, the availability of unhealthy foods, and overall dietary patterns, also limit the effectiveness of nutrition labelling policies in reducing obesity.

4. MARKET IMPLEMENTATION OF HSR

4.1. Adoption of HSR in the Food Market

As a voluntary FOP labelling system introduced in 2014, the HSR relies on manufacturers' willingness to display the rating rather than mandatory compliance. The adoption of the HSR system in Australia and New Zealand has reached a moderate but incomplete level of market penetration. Monitoring data from Food Standards Australia New Zealand (FSANZ) indicates that uptake remains substantially below policy targets. In Australia, HSR was displayed on approximately 39% of products intended to carry the label. Similarly, in New Zealand, the system was applied to approximately 36% of intended products. These figures are well below the final policy target of 70% adoption by November 2025 [16], suggesting that voluntary implementation has not achieved the intended level of market coverage.

This relatively low uptake highlights a key limitation of the real-world implementation of the system. Although the HSR is designed to provide a quick, simple, and standardized way for consumers to compare the nutritional quality of similar packaged foods, its effectiveness depends on widespread and consistent adoption across the food supply. When a substantial proportion of eligible products do not display the rating, the system is unable to provide a fully transparent information environment, thereby limiting its capacity to support informed food choices at the population level.

4.2. Selective Use of HSR by Manufacturers

Although the HSR system was introduced as a public health approach to help consumers compare the nutritional quality of packaged foods, its use in the marketplace has been uneven. Evidence shows that manufacturers are more willing to display the HSR on products with higher HSR scores, while lower rated products are less commonly labelled. Among products scoring 3.5 stars or above, 53% displayed the HSR, compared with only 24% of products rated 3 stars or below [17]. This pattern indicates that lower-rated products were much less often labelled, suggesting that manufacturers tended to display the HSR when it reflected positively on their products.

However, this pattern is not universal. Han and Hwang [18] found that even lower-rated products may still display the HSR, as doing so can convey transparency and strengthen consumer trust. In such cases, displaying a relatively low rating may serve as a way of presenting the brand as open and credible, despite the product having a less favorable nutritional profile. This suggests that decisions to display the HSR may reflect not only nutritional considerations, but also broader marketing strategies related to brand image and consumer confidence.

These findings highlight the dual role of the HSR in a voluntary labelling environment. While it can provide useful nutritional information, its application is also shaped by strategic considerations, as manufacturers weigh the potential marketing benefits of high ratings against the reputational value of transparency in lower-rated products. As a result, HSR operates not only as a source of nutritional information but also as a flexible marketing tool.

4.3. Implications of Real-World Implementation

The uneven and selective adoption of the HSR system limits its effectiveness in practice. First, incomplete uptake means that not all eligible products display the rating, resulting in an information environment that is fragmented rather than comprehensive. As lower-rated products are less often labelled, the information presented to consumers is not fully representative of the overall packaged food market. Second, this weakens the usefulness of HSR as a comparative tool. When some products display the rating while others do not, consumers are unable to make consistent comparisons across available options, which may reduce the clarity and value of the system at the point of purchase. Finally, these limitations may weaken the impact of HSR at the population level. Although the system may influence individual choices, its ability to support broader dietary improvement is constrained when information is incomplete and inconsistently applied.

5. FUTURE DIRECTIONS FOR IMPROVING HEALTH STAR RATING

5.1. Why the Current HSR Implementation May Not Be Sufficient

Despite its benefits in improving the accessibility of nutritional information and influencing product reformulation, the current implementation of the HSR system remains insufficient in addressing obesity-related dietary outcomes. This limitation can be understood through three key characteristics of the system: its static nature, lack of personalization, and limited behavioral impact.

The HSR functions as a static label that provides a standardized, one-size-fits-all evaluation of food products. The rating is calculated based on nutrient composition per 100 g or 100 mL and remains unchanged regardless of the consumer's dietary context or consumption patterns [13]. As a result, it does not account for factors that are directly relevant to weight management, such as portion size or total daily energy intake.

The system also lacks personalization. While the HSR offers general guidance on product healthfulness, it does not differentiate between individuals with different health conditions, dietary goals, or lifestyles. This limitation reflects a broader gap between population-level nutritional

guidance and individual dietary needs, reducing the relevance of the label in real-life decision-making contexts.

The behavioral impact of the HSR is limited. Although consumers may understand and use the rating system, this does not necessarily translate into healthier dietary behaviors. Factors such as taste preferences, price, and convenience continue to play a dominant role in food choices, while cognitive biases such as the health halo effect may lead to overconsumption of higher-rated products. Furthermore, broader environmental factors influencing obesity extend beyond individual food choices, limiting the overall impact of labelling policies alone.

5.2. Opportunities for Improvement Through Digital And AI-Based Tools

One promising approach to improving the effectiveness of the HSR system is the integration of digital tools that provide personalized guidance for weight management. Recent developments in personalized nutrition, such as the ZOE Nutrition App [19], demonstrate the feasibility of delivering AI-based dietary recommendations based on individual-level data, suggesting a potential pathway to enhance existing labelling systems.

A key limitation of the HSR lies in its lack of personalization. Although the system provides a standardized assessment of product healthfulness, it does not account for individual differences in energy requirements, dietary patterns, or weight management goals. This limitation could be addressed through a simple personalized system in which users input basic information such as height, weight, and weight management goals. The system could then estimate daily energy needs and provide an individualized reference point for interpreting food choices. Within this framework, the HSR continues to serve as a quick FOP signal, while digital tools provide personalized interpretation. For example, a product with a relatively high HSR may initially appear to be the healthier option, but when scanned, the system can indicate that it is high in sugar relative to a weight-loss goal or that a typical serving would account for a large share of the user's remaining daily energy intake. This allows the same rating to be interpreted differently across individuals. This approach also addresses limitations related to portion size and total intake. While the HSR is based on standardized quantities, digital tools can translate these values into realistic serving sizes and show their contribution to daily intake. In doing so, abstract nutritional information is converted into practical guidance for weight management.

Personalized systems can support behavior change by providing immediate, actionable feedback, such as warnings when intake exceeds daily targets or suggestions for alternative products. This helps reduce issues such as the health halo effect, where higher-rated products may otherwise be overconsumed. Overall, this approach preserves the simplicity of the HSR while enhancing its individual relevance, enabling it to function not only as an informational tool but as part of a broader decision-support system for weight management.

5.3. Potential Contribution of Improved Labelling Approaches To Obesity Prevention Beyond Australia and New Zealand

FOP nutrition labelling has been widely adopted in countries such as Australia and New Zealand, but its implementation remains limited in many Asian contexts, including China. Meanwhile, the prevalence of overweight and obesity has increased significantly in the country. As of recent estimates, more than half of Chinese adults are overweight or obese, and this proportion could reach around 70% by 2030 [20], prompting authorities to designate the coming years as national “weight management years” [21]. Together, these trends underscore the growing need for effective dietary guidance and greater food transparency.

China has not yet established a standardized FOP system, and the effectiveness of such systems within its specific food environment remains underexplored. At the same time, existing policies indicate a

clear governmental focus on dietary health: prepackaged foods have been required to display the Nutrition Information Panel since 2013, and the "Healthy China 2030" initiative emphasizes improving nutrition information accessibility and promoting healthier dietary habits [22]. Given these policy differences, directly transplanting the HSR system would face challenges. Unlike Australia and New Zealand, where the HSR operates as a voluntary, industry-led system, China's food regulation framework is strongly government-driven, suggesting that regulatory support and coordination with existing Nutrition Information Panel standards would be necessary for meaningful adoption.

At the same time, China's highly digitalized consumer environment presents opportunities to enhance the effectiveness of such a system. Mobile applications and QR code-based tools could allow consumers to link standardized labels with personalized, AI-supported dietary guidance, increasing interpretability and behavioral impact, particularly for weight management.

Overall, the experience of the HSR system suggests that FOP labelling can contribute to obesity-related dietary health promotion, but its success in China would depend on careful adaptation to local regulatory structures, existing nutrition policies, and digital infrastructure. Rather than functioning as a standalone intervention, such approaches should be embedded within a broader strategy for weight management and public health.

6. CONCLUSION

The Health Star Rating system provides a simple, standardized way for consumers to compare the nutritional quality of similar packaged foods, enhancing accessibility and supporting healthier choices. It also encourages manufacturers to reformulate products to achieve higher ratings, creating a market-driven mechanism for improving food quality. However, the system has several limitations. Its voluntary participation leads to selective labelling by manufacturers, while its static, non-personalized format may not reflect individual dietary needs. Additionally, consumer misunderstandings such as the health halo effect and inappropriate cross-category comparisons, can limit its effectiveness. Real-world adoption also remains incomplete, which limits the reach and consistency of the system. These limitations suggest that the HSR alone cannot address the multifactorial causes of obesity. However, if supported by digital tools and AI-based personalized dietary guidance, and adapted to local regulatory and cultural contexts, the system may play a more useful role in weight management and nutrition strategies. Overall, the HSR should be viewed as one component of a comprehensive public health approach rather than a standalone solution to obesity.

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