

# Visual Dominance on Food Labels: A Policy Call for Simplified and Healthier Choices

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## ABSTRACT

Food labels are the very first impression of the food product, so we can't underestimate the importance of the food labels. However, there is always a debate on the constituents or layout of the food labels. The importance of nutritional information on the food labels as a necessary component can't be neglected. Still, most food labels cannot deliver their message to consumers due to nutritional literacy, demographics, and cognitive pressure. This gap has paved the way for visual labels that are appealing and easy to understand, adding a convenient way to deliver. This review article discusses the importance of both visual and textual labels with a motive to adopt a balanced approach in food labeling, which is necessary for better consumer understanding and decision-making ability. Different studies have shown that visual labels containing warning symbols, color coding systems, and visual representation of textures help in quicker processing attraction and are also less hectic, putting less cognitive loads than the heavy text labels that are technical and require more time to process with prior food knowledge. Further, this review has also discussed the emotional link between consumer product choices and personal health concerns. The main challenge experienced by the food labels is consumer literacy, which is somehow linked to demographics like low-income consumer groups or underdeveloped communities, making it difficult to prioritize health due to availability and literacy issues. This review also discusses how visual labels are well adapted to modern human psychology, where humans mostly prefer immediate decisions using clues rather than deep analytical processing of information on food labels. This review suggests that visual labels must consider transparency, clarity, and visual appeal to target a broader range of consumers. Visually driven labeling practices can bridge healthier food choices and consumer understanding, contributing to better consumer purchasing behavior. This review also suggests a new food labeling technique, calling on the researchers to check the implications.

**Keywords:** Food Labels, Front of Package Labels, Consumer Preference

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## Introduction

The information to be included or displayed on the label is necessary, but another critical factor is the consumer's ability to interpret the label's information. The discussions about front-of-package (FOP) labeling were missing a key component discussion, and that was the consumer. Consumer choice was neglected, and total focus was placed on nutritional labeling while consumers were also interested in the taste, aroma, price, and emotional well-being. Any future discussion on food labeling must ensure that its primary focus is consumers rather than other components [1]. While planning the food label design, companies usually consider adults to be consumers, while the other ages of consumers (children and youngsters) are not considered as objectives of their products. The main reason behind this was that our youth's purchasing decision lies in their parents' hands. The need to target the youth as individual consumers is a missing approach while designing the product. Youngsters are the present and future consumers, so keeping them intact while designing future food policies is essential [2].

## Visual vs. Textual Labels

Studies have shown that visual labels are easier to interpret and make it easier to capture the consumer's attention than monochromatic (single-color text-only) labels. Quicker information processing and identification is another benefit of visual labels over text-only labels. Visual aids in food labels also put less cognitive pressure on consumers to process the information, making it clear that visual labels attract attention and increase consumers' understanding. Despite the benefits of visual labels, the study also suggests that labels must combine visual and text labels to make the approach effective [3]. This study nullifies the strategy focused on text overloading on food labels, asking the product owners to add visual aids for better results.

## Warning Labels and Cognitive Load

Studies show consumers more quickly processed labels with warning messages (a combination of text and visual) than nutritional labels and daily amount guidelines (GDA) labels. This was proved by comparing the complete fixation time (CFT), which was 1.028ms for labels containing warning messages, 2.698ms for nutrition labels, and 2.003ms for GDA labels [4]. This study strengthens our stance that labels must be a summarized version of text information and a combination of visuals.

## Consumer Engagement and Food Label Design

Food labels designed to cope with the food fraud issue must be addressed effectively, and labels are the most effective or only way to communicate with the consumer. However, the information layout on the food labels was not found useful by the consumers, or they lacked interest in the

information. The main reason behind the lack of interest in the label information was the information's position or location, design, symbol irregularities, text fonts, improper spacing, and word placement over the illustration [5]. This study highlights the importance of a balanced approach to presenting information on the food labels. This will ultimately help provide a better understanding of the food label.

## Psychological Impact of Visual Elements on Consumer Choices

Furthermore, the psychological impact of visual elements is profound; they can create emotional appeals that resonate with consumers, influencing their choices by tapping into their values and concerns. In Swedish consumers, visual labels highlighting ethical or environmental benefits can address cognitive dissonance (discomfort when a person's act does not align with their beliefs) regarding meat consumption, urging them to move towards more suitable alternatives [6].

The research also highlights that almost 90% of consumers are interested in getting information from the labels while purchasing fruit. However, this information utilization in purchasing decisions was not exceptionally observed, showing a gap between interest and actual use of label information. Consumers interested in food label information were mainly female (62%) and older customers over 40 years of age, showcasing the label information being influenced by demographic factors. Consumers were interested in information like harvest date, production method, and sensory characteristics (aroma, taste, and texture). Sensory attributes can only be conveyed via visual labels as the visual information may also help to cope with the information overload issue associated with heavy text labels [7].

## Transparency and Consumer Perception of Healthiness

Transparency of nutritionally healthy food increases the health perception of the food. In contrast, non-transparent packaging (packages with text information) of unhealthy food boosts the perception of healthiness regarding unhealthy food. Lower text information on the food labels proves to be a positive player in the intention of customers to purchase healthy foods. Meanwhile, a food label that is more focused on text is beneficial for healthier products. However, the complexity variation of consumer behavior is another issue, and individual labels for each customer are impossible [8]. This means the consumer perceives the label with more text information as healthier or may also create confusion among unaware customers, as they think the bulk text on food labels represents the healthiness of a food product.

## Front of Package Nutrition Labeling (FOPNL) and Consumer Preferences

The thesis tells that Front of Package Nutrition Labeling (FOPNL) has a good effect on consumer preferences for high-protein yogurts. This awareness was common in young adults (around 25) who exercise regularly. They found these nutritional labels more valuable than the unclear market claims. The study also highlights the link between transparency and building customer trust. The study further highlights that text-based labels provide detailed nutritional information, but interpreting such information depends on the customer's literacy level. On the other hand, visual labeling techniques like symbols or color-coded systems serve as a more effective way of guiding consumers, keeping the varying literacy levels in front [9].

#### **Consumer Literacy and Understanding of Nutritional Information**

The food label must contain nutritional information like energy declaration, macronutrients, and nutrients per 100 grams or 100ml of food that is proposed to be sold [10]. The standards demand detailed information on the label, but simultaneously, this information unintentionally may lead to consumer confusion. The food labels containing nutritional information mostly use two familiar words: serving size and portion size. These two words are almost considered the same by the consumer, and the consumer makes their choices by considering both terms the same. The primary purpose of these terms was to help the consumer to make better food choices [11, 12]. This means that the text information may lead to misunderstandings.

The Egyptians preferred food items with nutritional labeling, but this was subjected to social pressure and self-urges to buy such food items with nutritional labels. Customers' personal opinions about the labels (like or dislike) were not directly involved in purchasing such food items with nutritional labels. The main reason was that they were not on specific diet plans and had low literacy about the dietary labels [13].

Similarly, some studies' findings support that current labels cannot meet consumer needs, especially a survey on parents' and tweens' health choices. It was seen that when buying eatables for their children, parents could not understand the technical terms on the food labels, and their children or tweens rely upon their parents to make decisions regarding healthy food choices for them. So, this is a point of severe attention as the present labels have created a gap in label design that cannot address the needs of parents looking for simplicity to understand quickly and teach their children, those looking for educational support regarding health from their parents [14]. These findings suggest making the labels more straightforward to understand so that it may become easy for the parents to teach their dependents.

The issue of consumer understanding is also echoed in other research, like in Uruguay, where low-income mothers find it challenging to understand the complexity of the nutritional information on the food labels. Despite the attention and efforts to make better, healthier choices for their children, the mothers could not read labels regularly and did not read the ingredient lists. Low-income mothers mostly rely on previous knowledge or simplified strategies to buy food for their children, which might result in purchasing food high in sugar and salt [15]. This also highlights the need for streamlined and consumer-friendly food labels.

#### **Simplification of Nutritional Labels for Consumers**

The primary purpose of the nutritional information is to help consumers to make informed or healthy decisions [10]. This text information requires nutritional literacy, which is not shared. The Polish users responded well to the simple demonstrations like NutriScore rather than detailed text information like Reference Intake (RI) on the food label. The visually focused Front-of-Pack-Labels (FoPLs) were not only consumer-friendly but also helped Polish customers to make healthier purchases, which makes these visually focused FoPLs a strong alternative to detailed nutritional labels [16]. A small campaign on NutriScore can allow a layperson to interpret nutritional value quickly rather than using detailed nutritional text information on the label.

The simplification of complex information by using Eco-score has also been beneficial in accessing product information, especially for customers who are shopping under pressure or in a hurry and those with lower literacy levels. Providing the main point of concern to the consumer via the Eco score also helps reduce the cognitive load, and consumers do not lose interest in the product due to heavy text information. The research also indicates that consumers' responses to visual labels support the environmental concerns that consumers already know about. So, overall, visual labels bridge the gap for consumers who find heavy text labels challenging to understand, promoting better purchasing power across diverse demographics [17].

A study using California's policy shows that displaying calories in numeric numbers on the food label does not significantly affect the consumer's purchasing decision. The study suggests that numerical values must be combined with the media and other educational campaigns according to the

customer's behavior. The study also emphasizes the need for multiple food regulations as consumers perceive each food product differently [18].

Simplification benefits are also evident from a Study where simplified visualized labels result in more time the consumer spends on the product. Visual labels were also more successful in generating mental imagery than numerical labels, so the visual labels improved consumer healthfulness perceptions by creating mental images. When exposed to visualized nutritional information like protein  $\approx$  two eggs (icons of eggs), the consumer was likelier to purchase the bread products than numerical labels containing information like protein  $\approx$  15.4 g [19].

#### **Time Pressure and Consumer Decision-Making**

The study highlights that eye-tracking data using eye-tracking technology is significant in DCEs but also limited, as visual attention does not explicitly mean that the consumer conveys or understands the information. Studies suggest that electroencephalograms (EEG) and DCEs can better understand consumer's mental state. This indicates that even the use of visual labels is subject to the consumer's present condition; he is in a hurry, illiterate, or has any cognitive burden [20].

Under time pressure, consumers ignore nutritional text information. Visual clues like logos are not affected by time pressure and may drain consumers' attention, even when in a rush. Visual clues like logos are also easier for the consumers to interpret than the nutritional text information [21]. This can help make healthier choices in markets where users are always in a hurry, like supermarkets in peak hours or during sales or discount offers.

#### **Educational Demographics and Label Preferences**

The educated individuals were more likely to be interested in the nutritional information displayed on the labels in India. Their portion was only limited to one-third of the targeted population. The people were interested in the labels just to check the manufacturing and expiry dates, as the other nutritional text was too complex (technical) and hard to understand with zero nutritional knowledge. Participants suggested using holograms, larger fonts, and symbolic labels for better understanding. The nutritional information remained suitable for educated consumers. This raised the demand to launch awareness campaigns to make everyday consumers aware of the technical information or make the label designs simple and more visually focused [22].

Studies show that there is always a misconception about when logos or visuals are exposed to consumers. The study used two different logos; one was "tidy man," and the other was the "recycling logo." The consumer misinterpreted the logos and considered Tidy Man the sustainability signal over the recycling logo. However, the tidy man was just a random logo with no link to sustainability. This shows that even visual labels conveying ability depend on the customer's literacy level [23]. This strengthens the stance that if visuals that are more conveying can be misinterpreted, then how text labels can be considered a suitable way to deliver the message.

#### **Traffic Light Labels and Consumer Decision-Making**

A study on nutrition labels shows that NuVal labels were beneficial for better consumer decision-making regardless of the time pressure. However, participants preferred the traffic light labels over the NuVal labels when both were present, especially under time pressure. The consumers' best responses were recorded when they were free from cognitive pressure. This better response of consumers towards the traffic light labels also supported the fact that consumers preferred heuristic processing (that requires less mental effort for making decisions using mental shortcuts) over analytical processing (diving into the details of the labels) [24]. This study highlights that in the fast-growing world, human choices are also being shifted from analytical processing to heuristic processing, and traffic light labels are the best way to cope with the shifting human mindset.

#### **Visual Search Paradigm and Label Processing**

The Visual Search Paradigm revealed that consumer attention is mainly influenced by label size, position, color choice, and the logo's familiarity and placement of logos. It also shows that this approach helps consumers quickly locate and process labels, enabling them to sort products efficiently before evaluating their preferences, such as liking or disliking the product [25].

Companies should acknowledge the consumer's interest in text type and add them to the label despite making text-heavy labels. Study shows that consumers were interested in Product Designation of Origin (PDO Labels- labels containing information about the product's origin's origin). Consumer purchase intention and taste experience can be boosted by incorporating the product's origin into food labels. We can consider the origin of food addition in food labels as the central point for influencing consumer attention. This also shows consumers' emotional attachment to such products, especially those with the origin mentioned [26].

#### **Textural Complexity and Consumer Preferences**

Recent research significantly explains the importance of visual attributes like textural complexity on consumer choices. The study found that

consumers were more tilted toward the food, with a higher level of visual and textural complexity and multiple layers of different textures. This tilt was even though the consumer had access to additional text information. The study also finds that excessive text on food labels can detract the consumer from the effectiveness of visual cues. This study focuses on the fact that the text information on the food label is less effective, and the visual information alone is enough to drive a consumer's decision [27].

#### Guideline Daily Amount (GDA) Labels and Consumer Behavior

The introduction of the Guideline Daily Amount (GDA) Labels showed a slight decrease in the number of unhealthy products sold. Still ill, the individual choices were mixed, and no clear pattern was observed after adding the GDA Labels. Many buyers were stuck towards known products (pay no heed to healthy and unhealthy products), and adding GDA labels did not affect their loyalty [28].

No doubt, labels are the first impression of a product when it is listed in front of consumers. Low-fat labels are still much more effective in promoting healthier choices among people than the detailed caloric information on food labels. The consumers do not heed any caloric details when they find a clear and focused text marked "LOW FAT." This also highlights that consumers ignore or misunderstand the caloric count of a food product just by seeing the "LOW FAT" mark. This is false, as LOW FAT is not significantly linked with low calories. Low-fat labeled food is perceived as healthy by consumers [29]. This study further supports our claim that less, but effective text information can substantially impact the choices among consumers. The label can be modified to cope with the calories and low-fat milk-attending as "LOW FAT NOT CALORIES." Such modification can avoid confusion like the assumption that "Low fat ultimately means low-calorie count."

#### A Comparison of Consumer Response To Numerical And Warning Labels

Numerical labels containing caloric information like protein, fats, and carbs information were found to be used by consumers as more details or nutritional knowledge is required to understand this. However, the warning labels with phrases like "High in Sugar" or "High in Sodium" were found to be more beneficial in making healthier choices by reducing the purchase of sugary beverages. Using color coding systems like red for high risk, orange for medium, and green for safe or no risk also proved beneficial in making healthier food choices without having complex or detailed knowledge about the caloric information on the food labels. [30] Unique shapes like octagonal shapes followed by black borders can be used to design warning labels. The wording like "Excess of..." or "High in..." further added to the attention-capturing feature of the label. Such warning labels can help consumers to make healthy food choices [31].

For public health policy in Colombia, octagonal warning labels help reduce the consumption of unhealthier foods [32]. The warning labels can also draw the user's attention to read the complete nutritional profile. Still, the issue of consumer understanding of nutritional text information will remain the same.

A study in Costa Rica shows that the participants exposed to Octagonal Warning Labels (OWL) were more likely to buy the least harmful products than the control group (consumers not exposed to OWL) by recognizing the excess amount of sugars, sodium, trans fats, and saturated fats as compared to other labeling techniques like Guideline Daily Amounts (GDA), Traffic Light Labeling (TFL), and Nutri-Score (NUS) [33]. Although, this was still subjected to literacy levels of almost 98.04% of Costa Rica's population can read and write well. This study also strengthens the claim that warning labels are highly subject to location, as less attention will be paid to warning labels at places with less availability.

#### Simplicity in Food Package and Label Design

Similar research results also highlight the importance of simplicity in designing the label, as it will improve the consumer's understanding and decision-making ability. Minimalist labels help consumers understand the labels, promoting conceptual fluency that ultimately helps to process label information quickly, enhancing the ability of the consumer to make better choices related to health priorities. The conceptual fluency influenced by a more straightforward package design also helps promote the consumers' purchasing behavior. Consumer purchasing power is linked with brand awareness and how easily the brain processes the label information [34]. This means simple and visually appealing labels not only help in making informed decisions but also help in building brand loyalty, ultimately helping the company's business.

#### Conclusion

The review focuses on the benefits of visual labels and calls for policymakers and companies to make labels more focused on visuals and limit text information. Despite the consumer response, the importance of text information can't be neglected, and ultimately, cutting text information from the food label is impossible. Keeping up with the food market trends

and policies. It is also not good. Although different products are available in the market, having the same label and packaging design for all the products is impossible. For this, the following research should focus on innovative solutions like evaluation of the consumer response by adding a small detailed information page inside the food packages of biscuits (like in the medicines box) and limiting the food labels to contain more visual information and less text information on leading labels limiting it to manufacturing and expiry dates, brand names, slogans, price tags, QR Codes. A plastic thread-like ribbon can mention excess text information for snacks. Similarly, for beverages, the plastic thread with the cap of the liquid bottle is another suitable option to keep the food label focused on visuals. While such innovative approaches offer exciting possibilities, their practical implication and compatibility with the wide range of food products and shelf-life requirements remain a significant challenge. This requires mutual collaboration between researchers, companies, and policymakers to sit together and develop a balanced approach aligning with the visual appeal requirements, consumer understanding, and compliance with food safety regulations.

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