PROMOTING NUTRITIOUS FOODS CHOICES THROUGH THE USE OF FRONT-OF-PACKAGE LABELS AND VISUAL CUES

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Eva C. Monterrosa

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ABOUT GAIN

The Global Alliance for Improved Nutrition (GAIN) is a Swiss-based foundation launched at the UN in 2002 to tackle the human suffering caused by malnutrition. Working with governments, businesses and civil society, we aim to transform food systems so that they deliver more nutritious food for all people, especially the most vulnerable.

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The GAIN Discussion Paper series is designed to spark discussion and debate and to inform action on topics of relevance to improving the consumption of nutritious, safe foods for all, especially the most vulnerable.

The Global Alliance for Improved Nutrition (GAIN)
Rue de Varembé 7
1002 Geneva
Switzerland
T: +41 22 749 18 50
E: info@gainhealth.org

www.gainhealth.org

SUMMARY

Devising strategies to support consumer food choices is a high priority for the food systems and health agenda. Front-of-package labels (FOPL) provide visible nutrition information on packaged foods and have been introduced in 55 countries. However, a better understanding of how these tools support point-of-purchase decision-making is needed. In this discussion paper we examine the types of FOPL currently in use and how they align with consumer decision-making. We also examine the implications for deploying FOPL and other visual cues at points of purchase in low- and middle-income country (LMIC) contexts.

The FOPL currently being deployed describe or interpret nutrition information. These label types require the consumer to judge whether the product is nutritious. Most consumers, however, do not think much about their food purchases. Instead, they rely on simple, fast rules (heuristics) to make those choices. Labels that support this heuristic-based decision-making are those that are fully evaluative (i.e. a brand or symbol) and 'judge' the product as nutritious or not. Further testing and experimentation in LMIC contexts are needed to understand if heuristic-type FOPL support consumer decision-making at points of purchase.

FOPL and related visual cues needs to be re-assessed by normative agencies and policymakers to ensure they are recognisable, salient, and easily understood. Moreover, they should not be deployed as a standalone intervention but rather as a tool in a well-designed, sustained communication and marketing strategy.

KEY MESSAGES

- FOPL and visual cues must be easy to understand if they are to support consumer food choices.
- There are a wide array of FOPL, but most are 'descriptive' or 'interpretive', such that the consumer must draw their own conclusions about whether a food is nutritious.
- Consumers tend to use simple rules to guide their choices. This aligns to 'evaluative' FOPL, which simply state whether a food is nutritious or not.
- FOPL should not be a standalone intervention but rather a tool in a broader communication and marketing strategy to support better diets. Consumers' attention to a given cue can be activated and sustained with emotive promotional campaigns.
- There is a critical need to understand the impact of FOPL and visual cues in LMIC contexts, especially among low-income consumers.

BACKGROUND AND OBJECTIVE

Low-quality diets are the leading risk factor for poor health globally (1). Low-quality diets are those that contain insufficient calories and nutrients or too many calories and anti-nutritional components. While there are many political, cultural, and institutional drivers of low-quality diets, ultimately 'what to eat' is a choice made multiple times per day by most consumers globally. Thus, strategies to enable and promote good food choices should be high on the agenda for improving food systems and health.[1] In the 2014 Second International Conference on Nutrition framework for action, nutrition labelling was listed as an action area to empower consumers to make healthier food choices (4).

As a policy tool, food labelling aims to provide accurate information about the product and activate consumer attention to nutrition (4). The range of on-package nutrition labels, found on the front, back, or side of a package, includes nutrition facts panels, ingredients lists, and nutrient or health claims. Evidence from high-income countries shows that these labels are used mostly by consumers with high literacy/education or those motivated by health goals (5,6).

Policymakers have turned to front-of-package labels (FOPL) to make back-of-package nutrient information more consumer-friendly by combining numeric information with symbols and colours. There is no standard for what constitutes a FOPL, and various types are currently in use (4) (see table 1). The Codex Alimentarius, a set of global standards, codes, and guidelines related to food (7), defines labelling as any visual identifier (written or pictorial) on or near the food for promotional purposes, but there is no formal standard for FOPL (8). The World Health Organization (WHO) and Codex are currently reviewing guidelines and evidence to support countries in deploying FOPL (9). Currently, 55 countries across the European, Latin American, and Western Pacific regions use some type of FOPL system (8); of these, six countries have mandatory FOPL (10).

In general, packaging is used by food manufacturers to communicate with the consumer. The brand and the packaging are two visual identity elements that connect marketing and advertising to the point of sale (4,11). FOPL are used on packaged food, but in low- and middle-income country (LMIC) contexts, where much food is sold unpackaged, point-of-sale advertising (through shelf labels, banners, or signage) is an important promotional tool that can serve similar purposes to the information found on packaging in other contexts. Thus, we use the term **visual cues** to capture the range of pictorial and (short) written labels that appear on or near packaged and unpackaged food products and are relevant stimuli that might influence decision-making. The term 'visual cues' aligns with the Codex definition of labelling.

Given considerable global action related to this policy tool, an updated approach to deploying and designing FOPL and visual cues to support consumer decision-making is urgently needed. We also need more programmatic and research evidence from LMICs. The aim of this discussion paper is to help fill this gap. It will address the feasibility of FOPL, and visual cues more broadly, for influencing consumer choice in LMICs. Specifically, the paper will describe the most prevalent FOPL systems and summarise the pathways through which FOPL and visual cues are theorised to influence choice. Finally, it will examine the feasibility

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[1] Policies to guide choice tend to focus on economic incentives and disincentives for the consumer or supply chain actors. See (2,3)

of using FOPL and visual cues to promote nutritious foods. Although a critical function of FOPL is to encourage product reformulation, that topic is beyond the scope of this paper. For further reading on FOPL and reformulation, please see (12,13).

This paper builds on GAIN's active work in the area of demand creation: a long-term outcome of demand creation is to influence consumer choice at points of purchase, and FOPL and visual cues are two tools that GAIN considers relevant to this work. In 2018 and 2019, GAIN hosted three workshops (one in London and two in Dubai) on the use of visual cues in Pakistan (see related convening paper,(14)); this paper draws on those discussions and related work.
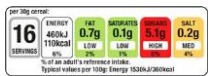
DISCUSSION

FOPL SYSTEMS

FOPL systems consist of two parts. The first is the 'message' that is communicated to the consumer. From a communication point of view, FOPL sit on a continuum from descriptive (or reductive) to declarative (evaluative)(15). A descriptive FOPL will list only key nutrients (normally as a percentage of recommended daily intake values); no opinion is given as to whether the product is nutritious or not. In the middle of this continuum are hybrid or interpretive FOPL, which use a colour scheme or another visual device to summarise solely nutritional information; examples include the Traffic Light, NutriScore, and Health Star Rating System (10,15). They are called 'interpretive' because they provide only a recommendation, and the consumer must interpret that recommendation or information. On the other end of the continuum are the fully declarative (or evaluative) FOPLs, which rely on symbols to communicate whether or not a food is 'healthy'(15). Most countries (70%) use a 'descriptive' or 'interpretive' type of FOPL (8), so the consumer must decide if the food is nutritious or not. FOPL can be used under mandatory or voluntary systems, government led or industry led.

The second part of an FOPL system is the nutrition criteria or algorithm that determine the overall 'healthiness or unhealthiness' of foods. Most criteria consist of a nutritional ingredient (e.g., fats, sugar, calories, protein) and a cut-off value. Nutrient profiling criteria, including cut-offs, are informed by evidence and expert opinion (16). The criteria can be restrictive (e.g., in the case of Chile) in that they are applied evenly across all food categories, or they can discriminate within product categories (e.g., the Choices and Keyhole systems (see Table 1)). Some argue that within a product category algorithms are more useful because they help the consumer distinguish a better choice from similar options (15). The stringency of the criteria determines how many products carry the FOPL. In Chile, for example, in 2015 38% of packaged foods did not carry a warning label (17), but it was projected that, due to the progressive implementation of the nutrient criteria without any reformulation, by 2019 only 17% of foods would not carry a warning label.'

Table 1 captures some of the commonly used FOPL systems; many similar systems exist worldwide (10). Newer systems tend to combine elements from different FOPL. For example, The French system, NutriScore, combines elements of the Australian HSR (rating scale, 1-5) and UK Traffic Light Symbol (colours for good, stop, caution) (18). NutriScore FOPL format uses a five-colour gradient, from dark green to dark red, and a declarative letter grade A to E (19).

Table 1. Description of selected front of package labelling (FOPL) systems

Label	FOPL category	Nutrient profiling system	How it works
Stop signs [Chile]	Evaluative negative, binary	Based on thresholds for critical nutrients: sodium, sugar, saturated fat, and energy density. Thresholds are set for two category types: solid foods and liquid foods.	Foods containing critical nutrients that exceed the threshold receive a black label 'high in X.' Used on packaged foods only. Mandatory.
Keyhole [Norway, Sweden, Denmark, Iceland]	Evaluative, binary	Based on thresholds for critical nutrients (sodium, sugar, total fat, saturated fat) and key nutrients (fibre). Thresholds are set for 33 food categories.	Foods that are below the maximum threshold for all critical and key nutrients can carry keyhole symbol. Used on packaged and unpackaged foods. Voluntary.
Choices Programme [Global]	Evaluative, binary	Based on thresholds set for critical nutrients: saturated fatty acids, sugar, trans fatty acids, and sodium. Thresholds are set for energy and dietary fibre for some of the product groups. Threshold set for 22 basic products categories, plus additional categories for mixed and specialty meals.	Foods that are below the maximum threshold for all critical and key nutrients receive the Choices checkmark logo. Used on packaged and unpackaged foods. Voluntary.
Traffic Light [UK]	Hybrid, ordinal	Colour codes are based on threshold levels for each critical nutrient (fat, saturated fat, sugar, and salt): red (high levels), yellow (medium), and green (low). Thresholds are set for two category types: solid foods and liquid foods.	Each FOPL contains a combination of colours for each of the four critical nutrients. Used on packaged foods only. Voluntary.
Health Star [Australia, New Zealand]	Hybrid, ordinal	A nutrient algorithm assigns baseline points based on saturated fatty acids, total sugars, sodium, and/or energy. Modifying points are awarded based on the 'naturalness' of the food and other positive nutrients, such as fibre and protein. There are four food categories that are assigned points: dairy, non-dairy beverages, oils/spreads, all other foods.	The HSR score = baseline – modifying points. The HSR score is then assigned a health star rating, from ½ star to 5 stars. The higher the star rating, the healthier the food. Processed, packaged foods only. Voluntary.

Nutriscore [France]	Hybrid, ordinal	A nutrient algorithm assigns a score to food based on energy, sugars, saturated fatty acids, or salt content (i.e., nutrients to avoid). It also assigns a score based on the proportion of fibre, protein, fruit, vegetables, or nuts present in the food (i.e., positive nutrients).	The final score = nutrient to avoid score – positive nutrient score. The final score is converted to a letter score. A/green to E/red is a 5-point scale, from best to worst. Used on packaged foods only. Voluntary.
Facts Up Front [US]	Descriptive, ratio	No nutrient profiling system is used. Nutrition information typically on the back of the package is presented on the front, and visibility is given to 'problem nutrients.'	Run by the Grocery Manufacturers Association. Voluntary.

ᵃ Descriptive = no recommendation is given. Evaluative = recommendation stating if the food is nutritious or not. Hybrid = combination of numbers and evaluative information on FOPL; the consumer must decide if the food is nutritious or not. Also known as an interpretive label. Ratio = label type is numbers and percentage of recommended daily values. Ordinal = label type is a ranking of the healthiness of the food on a scale from least to most. Binary = label type is symbol/words and is either present or not.

Critics of labelling systems argue that while FOPL facilitate nutrition information exchange, some labels are poorly designed in support of consumer decision-making (15,18,20). Moreover, in the context of food purchasing, there are many stimuli that might trigger a decision, such as product appearance, sensory characteristics, package size/shape, logos, brands, and advertising, as well as other perceptual stimuli in the food purchasing environment (15). One cannot assume, however, that nutrition is a key criterion shaping the decisions of most consumers (21).

PATHWAYS OF INFLUENCE: FOPL AND CONSUMER CHOICE

The human brain processes information along a continuum of automatic and unconscious to conscious (22). When a judgement and a choice are to be made, decision theory posits that the brain primarily uses one of two pathways (see figure 1) (23): the deliberative pathway, drawing on existing knowledge, or the heuristic (or 'rules of thumb') pathway for quick processing of cues. FOPL (and other visual cues) act as a stimulus to activate one of these pathways. The design of an FOPL system depends on whether one believes that food purchases draw on a consumer's deliberative or heuristic processing pathway. However, there are other factors, such as the frequency of purchase (24), level of involvement (24), purchasing context (25,26), and consequence of the decision (e.g., health) (27), which influence the decision-making process.

A descriptive or interpretive FOPL will trigger the deliberative pathway; a consumer must draw on existing nutrition knowledge to interpret the label. Consumers who are motivated to search and use nutrition information as a criterion (27) are those for whom food decisions carry significant consequences (e.g., avoid a food allergy or avoid high blood glucose) (6) or who are otherwise motivated to do so. Significant cognitive resources are needed to deploy the deliberative pathway (28).

Given the frequency of food purchasing decisions (24), it is unlikely that the brain will deploy a high level of cognitive effort in making every food choice. Most food decisions are themselves inconsequential: many foods might satisfy a need. Therefore, for the average consumer, food decisions are typically considered 'low involvement' decisions (24,29). This

level of involvement, along with the need to simplify decision-making, suggests that food decision-making is dominated by the heuristic pathway.
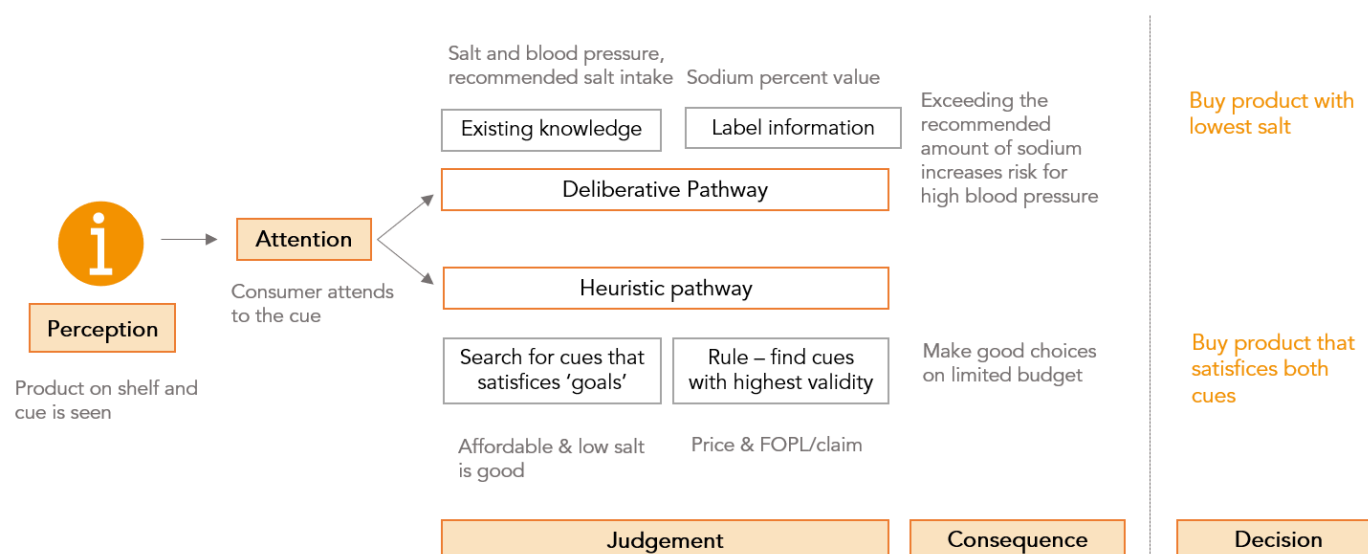

Figure 1. Simple schematic depicting the two dominant decision pathways and their relevance for food choices. The deliberative pathway example shows how existing knowledge of nutrition and health outcomes is needed to interpret label information. The heuristic example shows how simple rules and cues are used to make choices.

The heuristic pathway allows for quick and efficient decision-making over similar choice categories by drawing on cues and simple rules (30). The processing is based on associations and inferences between a cue in the external environment and information stored in memory (31,32). Thus, a heuristic-based FOPL is an evaluative symbol that would be supported by marketing to make the cue recognisable, salient, and easily understood (15,29,33).

Research to examine the use of FOPL in decision-making has largely been done in high-income countries (HICs) and in laboratory settings (not real-world situations), where consumers are aware of study's purpose and the label. Testing of labels in a laboratory setting is required to assess the acceptability and clarity of the label before full deployment at scale. However, this type of research cannot estimate the impact of the FOPL on food choice; for that, data on actual purchases is necessary (18,21,34). Moreover, researchers have not adequately characterised how purchase involvement, purchasing context, and purchase goals affect food choice in LMIC contexts. Further analysis is needed to understand how FOPL affect the market for nutritious foods (35).

KEY CONSIDERATIONS WHEN DEVISING VISUAL CUE SYSTEMS TO INFLUENCE CONSUMER CHOICE AT POINTS OF PURCHASE IN LMICs

FOPL from HICs are currently being adapted for use in LMIC contexts. However, most of the research on FOPL has been done in self-service retail environments in Western countries, where food is sold primarily in packages and the front of a given food package is displayed openly on shelves. The majority of the LMIC population does not use this type of modern

retail outlet; instead, these consumers mostly buy unpackaged foods at traditional open-air markets and small stores(14). This raises a number of questions, discussed here.

Food purchase context – where to put the visual cue so the consumer sees it?

Information processing begins with the processing of visual stimuli by the brain (36). A shelf label placed next to the price has been shown to reduce consumer purchases of products containing trans fats or sugar in Canada and the U.S. (34). Shelf labels in small stores in the U.S. were shown to be effective in influencing choice (37). In low-income purchase contexts, where consumers are price sensitive (28), visual cues near price labels might elicit heuristic processing of a simple rule, such as 'buy the cheapest, most nutritious option.' In places where shelves are not used for food displays or where literacy rates are low, bin markers (e.g., flag), bin colours, or symbols near prices, may be deployed to assist in decision-making at point-of-sale.

Consumer attention – will they attend to the cue?

Attention is quite relevant for the conscious processing of information (36,38). The level of attention given to a cue may be influenced by a consumer's time and nutrition/information constraints, as well as a consumer's feelings, or their need to justify choices (20,39). In some LMIC purchasing contexts, such as small stores and kiosks, the vendor may also direct consumer attention. In both traditional and modern retail purchase environments, there are many sensory cues, so consumers selectively attend to some cues over others. A new cue might initially 'grab' attention, but over time attention wanes. A recent qualitative study of warning labels in Chile showed that because the FOPL are ubiquitous, mothers are paying less attention to the labels (40).

Emotional advertising on television or point-of-sale (e.g., images/pictures) could assist in capturing attention, improving feelings and affinity to the cue, and motivating consumers to actively search for the cue (41). Engaging the vendor with a 'cue script' to deliver to the consumer emotive information about the food product/cue may also be an option to improve consumer attention (42).

Consumer understanding – will they know what the cue means?

Consumer understanding of a visual cue can be facilitated by ensuring that the cue is unambiguous, such that a FOPL that represents 'better nutrition' is placed only on products that are indeed nutritious. Ambiguity can be introduced in how one sets the algorithm (nutrient criteria) cut-offs, the visual cue design, and inconsistencies between the cue and existing labelling rules. For example, using a 'star' to rate non-nutritious options could be misinterpreted as being 'OK,' as could allowing an on-package nutrient claim (e.g., 'high in iron') on foods classified as non-nutritious. Labels that are ambiguous create the opportunity for 'health halos' (43), where cues appear to sanction a food, condone a poor choice, or imply a 'health' claim. Evidence from Europe shows that products with a health logo or health rating system are rated as being more healthy compared to products with only a descriptive nutrition label (44).

In the LMIC context where information and literacy constraints are common, it is critical to ascertain if a cue gives rise to a 'halo' effect. Voluntary labelling rules may encourage

ambiguity because the cue, which is to be used in making a judgement, is not available across all products. It is also likely that a combination of FOPL types (positive and negative labels) is needed to facilitate consumer understanding (33). FOPL systems must also avoid being simplistic or too complicated (45), as they run the risk of being perceived as less trustworthy (27,44). Thus, FOPL systems need to be easy to understand and representative of the criteria being communicated (good or bad nutrition).

Relevance – will the consumer use the cue in decision-making?

The prevailing policy goal for FOPL is purchasing the most nutritious choice, most of the time (see (46)). In contrast, the aim of a visual cue system should be to help most consumers make better purchases more often. A consumer-centred visual cue system thus must be designed based on the understanding that taste, brand recognition, and price are also salient choice criteria (20).

Moreover, if it is understood that the brain seeks to simplify our many food decision tasks via heuristic processing (31,47), then an evaluative (symbol-like) visual cue system would be the preferred option. A heuristic-based system would allow the consumer to integrate a cue into their own existing simple decision rules. For example, there is some evidence that Chilean mothers are developing their own simple rules (e.g., 'buy products with fewer warning labels') to make less 'harmful' choices (40).

For modern retail environments in the U.S., the U.S. Institute of Medicine has already issued a recommendation to ensure FOPL help consumers at points of sale. They suggest using a FOPL that is evaluative and ordinal; deployed consistently across all fresh and packaged foods; easy to understand; and backed up by sustained marketing efforts (5). Thus, an evaluative, brand-type symbol, sustained by strong marketing strategies, is seen as more likely to support food decision-making (48).

Promotion campaigns – how is the cue promoted?

Branding and marketing experts would agree that on-pack labels and other cues in retail environments are tools within a marketing and communication strategy. In public health, however, FOPL have too often become *the intervention* rather than *a tool* in a well-executed campaign that aims to motivate consumers (49). Furthermore, the dominant promotional approach has been functional messaging,[2] such as messaging on how to interpret labelling information, rather than emotive communication that would seek to create an affinity to the cue, motivate consumers,[3] and capture their attention (38). Much more of the latter type of promotion is needed in order to ensure visual cues succeed.

CONCLUSIONS

In summary, FOPL, if well designed, may support consumer decision-making. However, this paper suggests that most FOPL deployed today help only a small segment of the population. Descriptive and interpretive FOPL (the main type currently in use) leverage the consumer's deliberative processing pathway, so they are useful for those consumers who have existing

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[2] https://www.gmaonline.org/issues-policy/health-nutrition/facts-up-front-front-of-pack-labeling-initiative/ offers an example of functional messages for 'fact up front' FOPL.

[3] Obaasima is an example of an emotive campaign for fortification symbol: http://obaasimaghana.com/media.php

nutrition knowledge and who are highly motivated. Because of the nature of food decisions and the need to simplify choices, the evidence suggests that the deliberative pathway is largely irrelevant for most consumers. Thus, most consumers are unlikely to significantly benefit from the FOPL used today.

It is an opportune time to re-assess the use of FOPL and visual cues as policy tool. We acknowledge there are many factors that influence individual decision-making, and that the policymaking process is long and difficult. If public health policy is to be equity promoting and consumer centred, however, then FOPL and visual cues first need to be recognisable, salient, and easily understood, with a low level of ambiguity. Visual cues and FOPL should facilitate food decision-making via the heuristic processing pathway, rather than the deliberative pathway. Second, they must be deployed as part of a well-executed marketing campaign, not as a stand-alone labelling intervention. Marketing and communication are necessary to activate consumers' attention and motivate them to use the cue in decision-making. Finally, FOPL must be mandatory for packaged and unpackaged products. Mandatory systems are necessary to support cue relevancy and consumer understanding.

In order for these recommendations to be valid in LMICs, they need to be tested in both laboratories and real-life LMIC purchasing environments. We also need panel studies to assess how consumers use and adapt to visual cues. For example, do consumers develop simple rules based on the nutrition criteria? Evidence from Chile seems to suggest so. Other priority research gaps include how consumers make inferences from cues, heuristic-based food rules, and how consumers resolve multiple goals (e.g., cost, nutrition, and taste).

Getting the algorithm right is essential, as it has direct implications for the visual cue design (interpretive vs. evaluative) and its validity, which influence consumers' understanding of the cue. Above all, visual cues must work *for* consumers: consumers' choices must be the driver of food industry reformulation, as industry responds to market demands. With these principles in mind, visual cues can be an important part of a strategy aiming to shape a more nutrition-supporting food system.

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