

# Directive vs. Non-Directive Front-of-Pack Nutritional Labels: Evidence on Healthiness Perceptions and Purchase Intentions from Private Label and National Brands in Poland

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**Abstract.** *This exploratory study examines how directive (Nutri-Score) vs non-directive (NutriInform Battery) front-of-pack nutrition labels (FOPL) influence Polish consumers' perceptions of product healthiness and purchase intentions in the breakfast cereal category, while controlling for brand type (national brand vs private label). Using a 2 × 2 between-subjects experimental design with 202 Polish primary grocery shoppers, we compare Nutri-Score and NutriInform applied to fictitious cereal brands. Results from a MANOVA followed by univariate tests show that FOPL significantly affect perceived healthiness and, to a lesser extent, purchase intentions (with small effect sizes), while no significant differences emerge for brand attitude, trust, word-of-mouth or loyalty-related outcomes. Brand type does not significantly moderate these effects, suggesting that FOPL act primarily as category-level informational cues rather than as brand-differentiating levers. The findings reinforce the informational role of FOPL in supporting more informed choices and highlight their limited immediate impact on broader brand-relationship metrics, offering insights for both retailers and policy makers in non-harmonized FOPL environments.*

**Keywords:** *Front-of-Pack Nutritional Label (FOPL), Nutri-Score, NutriInform Battery, Perceived Healthiness, Private Labels, Attitude Toward the Brand, Purchase Intention, Poland.*

**1. Introduction.** The increase in the consumption of specific nutrients, together with the growing prevalence of sedentary lifestyles, has contributed to the rise of overweight and obesity globally (World Health Organization, 2021). In response, institutions and companies have promoted several initiatives aimed at guiding consumers towards healthier food choices, including Front-of-Pack Nutrition Labelling (FOPL) systems that make nutritional information more salient during purchase decisions (Hamlin et al., 2015; Deren et al., 2021). At the same time, the spread of heterogeneous FOPL systems across European countries has fueled the debate on the identification of a harmonized model at the EU level (Mazzù et al., 2023). From a conceptual point of view, FOPL systems can be divided into two macro-categories. Directive labels, such as the Nutri-Score, provide a synthetic assessment of the overall nutritional quality of the product through simplified and algorithmic indicators. In contrast, non-directive labels, such as the NutriInform Battery, present detailed numerical information related to the main nutrients, requiring greater cognitive effort on the part of the consumer (De la Cruz-Góngora et al., 2017). This distinction implies that different labelling formats can activate different decision-making mechanisms. Directive labels may serve as simple evaluative heuristics focused on the individual product, whereas non-directive labels may foster more analytical processing and spill over to brand-level evaluations such as transparency and competence.

Considering these differences, the present study examines the interaction between label format (FOPL format) and brand type, postulating that the effects of FOPL vary according to the type of information provided and the competitive context. A heterogeneous impact on consumer responses is assumed: directive labels would exert a more immediate influence on product evaluations (e.g., healthiness or nutritional quality), while non-directive labels would foster perceptions of transparency, reliability and competence at the brand level. To investigate these dynamics, the Polish market represents a relevant empirical setting, allowing to evaluate the complementary role of FOPL not only as a public health tool, but also as a strategic signaling mechanism in consumer decision-making. In fact, Poland has one of the highest rates of overweight in Europe with about 76% of the adult population classified as overweight and 32% as obese (EUFIC, 2025), despite not having adopted an official national FOPL system or a uniform dissemination of specific schemes (World Obesity Federation, 2025). This context, characterized by high obesity prevalence and limited prior exposure to harmonized FOPL schemes, offers a relevant testbed to assess the informational role of FOPL in a market where their adoption is still largely voluntary (Storcksdieck Genannt Bonsmann et al., 2020).

Although prior research has extensively investigated the impact of FOPLs on product evaluations and purchase intentions, less attention has been devoted to the interaction between label format and brand context. In particular, limited research has explored whether directive and non-directive labeling systems generate different responses when associated with private labels versus national brands. This study contributes to the literature in three ways. First, it compares directive and non-directive FOPL formats within a unified experimental framework. Second, it examines

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whether label format interacts with brand type (private label vs national brand). Third, it extends prior research by considering both product-level evaluations (e.g., healthiness) and brand-level responses. Accordingly, this study investigates whether directive and non-directive FOPLs activate different cognitive processing mechanisms and how these mechanisms influence both product-level evaluations and brand-related responses.

## 2. Literature Review.

### 2.1. FOPL and consumer decision making

Previous research has demonstrated that consumer behavior towards food products is shaped by a variety of factors, including the presence of nutritional labels, price, and the product's ability to satisfy hedonic needs (Cornil & Chandon, 2016; Hagen et al., 2017; Liu et al., 2019). Concurrently, several studies have highlighted the effectiveness of front-of-pack nutrition labelling systems in enhancing consumers' perceptions of product healthiness and in strengthening positive attitudes towards the brand (Baccelloni et al., 2021; Egnell et al., 2022; Post et al., 2010). Within this framework, improvements in perceived product healthiness are associated with more favorable brand attitudes, which in turn exert a positive influence on purchase intentions. This relationship is consistent with existing literature suggesting that positive health-related perceptions foster more favorable attitudinal evaluations and stronger behavioral intentions among consumers (Küster-Boluda & Vila, 2020). Furthermore, the literature underscores the role of nutritional labels in influencing consumer behavior through cognitive and evaluative mechanisms that enhance perceptions of healthiness and generate positive brand attitudes during the purchase decision-making process. In this phase, consumer perceptions and attitudes interact dynamically, whereby perceptions of a product shape attitudes towards it, which subsequently influence purchasing decisions and behaviors (Wang, 2024).

### 2.2. Directive vs non-directive labels

FOPLs differ not only in the information they provide but also in how they structure consumers' interpretation of nutritional information. Directive labels such as Nutri-Score provide an immediate evaluative signal that simplifies nutritional information, facilitating heuristic processing. Conversely, non-directive systems such as NutrInform Battery require consumers to process numerical information and perform a more analytical interpretation of nutritional values.

### 2.3. Brand context

In addition, prior research emphasizes the pivotal role of the brand as an interpretative framework within the consumer decision-making process, capable of guiding evaluations and behaviors. Consumers who predominantly purchase manufacturer brands tend to place greater emphasis on brand-related cues and prefer branded products, to which they attribute higher value (Goldsmith et al., 2010). In response, many brands have implemented initiatives aimed at introducing or enhancing nutritional labelling systems to improve the accessibility and usability of nutritional information. These initiatives are designed to support consumers during the purchase process by offering more immediate and intuitive information, thereby complementing the traditional back-of-pack nutritional label (Ikonen et al., 2019; Medina-Molina et al., 2021). Beyond the effects of labelling alone, brand familiarity further contributes to consumers' perceptions of food healthiness, often leading to more favorable evaluations compared to less familiar alternatives (Ponnam et al., 2015; Godden et al., 2023). This effect can be attributed to the strong brand equity developed by firms, as well as to a reduction in cognitive effort through established mental and social associations linked to branded products (Cobb-Walgren et al., 2016; Franca et al., 2025). Building on this evidence, it can be hypothesized that regular private label consumers may respond more strongly to the presence of front-of-pack nutrition labelling systems. In such cases, the informative role of labels may not only affect product evaluations but also influence overall brand perceptions, with indirect effects on consumers' purchase intentions (De Temmerman et al., 2021).

### 2.4. Hypothesis

Overall, prior studies suggest that FOPL primarily affect cognitive evaluations, such as perceived healthiness, with potential downstream effects on purchase-related outcomes, while their impact on broader brand-relationship metrics (e.g., trust, loyalty, loyalty program enrolment) remains more ambiguous. This study therefore examines a broad set of product, brand and retailer-related responses to investigate where directive vs non-directive labels exert the strongest influence. In addition to product-level outcomes, exploratory analyses examine whether FOPL formats influence broader brand-related responses such as brand attitude, trust, and word-of-mouth.

Formally:

- H1: Exposure to a directive FOPL will result in higher perceived healthiness compared to a non-directive FOPL
- H2: FOPL format will positively affect purchase intention, with stronger effects for the directive label.
- H3: Brand type (national brand vs. private label) will moderate the relationship between FOPL format and consumer evaluation.

**Methodology.** A breakfast cereal package was used as the experimental stimulus, with all brand-identifying elements removed to avoid brand-related biases. Front-of-pack nutrition labels (FOPL) were subsequently digitally applied in a prominent and clearly visible position on the packaging, in line with the procedure adopted by (Mazzù et al., 2024). Specifically, the Nutri-Score was used as the directive labelling system, whereas the NutrInform Battery was adopted as the non-directive labelling system.

A pre-test on 86 Prolific participants identified fictitious brand names for the national brand and private label conditions. Zenya ( $M = 4.48$ ;  $SD = 1.24$ ) was selected as the private label name and Olympia ( $M = 5.16$ ;  $SD = 1.23$ ) as the national brand name (Figure 1). This procedure minimized potential perceptual biases among respondents, confirming that

respondents associated Olympia with a national brand and Zenya with a private label:  $\chi^2(1, N = 84) = 8.60, p = .003$ .

**Figure 1. Experimental stimuli**



The main study was conducted on a sample of 202 Polish primary grocery shoppers recruited through Prolific. Most respondents were aged between 18 and 44 years and held at least a secondary education degree; women represented 34.7% of the sample. Participants were randomly assigned to one of four experimental conditions in a  $2 \times 2$  between-subjects design (Brand: national brand vs private label; Label: Nutri-Score vs NutrInform Battery). Data were analysed using a multivariate analysis of variance (MANOVA) conducted using SPSS. The analysis examined the effects of Brand and Label on multiple dependent variables simultaneously, including perceived healthiness, attitude toward the brand, purchase intention, tastiness, word-of-mouth, trust, familiarity, and private label usage. In order to capture potential spillover effects from product evaluation to broader retailer-related outcomes, the study also includes variables related to retailer loyalty and loyalty program enrolment. All scales were measured using multi-item 7-point Likert scales adapted from validated sources (see Appendix) and showed satisfactory reliability.

**Results.** A two-way MANOVA was conducted with Brand and Label as independent variables and the ten dependent variables. Using Pillai's Trace, the multivariate effect of Label was significant,  $V = .132, F(10, 189) = 2.87, p = .002$ , partial  $\eta^2 = .132$ . In contrast, neither the multivariate effect of Brand,  $V = .046, F(10, 189) = 0.91, p = .525$ , nor the Brand  $\times$  Label interaction,  $V = .041, F(10, 189) = 0.81, p = .618$ , reached statistical significance. Levene tests indicate that the homogeneity assumption of variances is satisfied for most dependent variables. Although some violations were observed for RBL and TR, the use of Pillai's Trace and the absence of significant univariate effects for these variables suggest that the results can be considered robust. Follow-up univariate ANOVAs showed a significant effect of Label on perceived healthiness,  $F(1, 198) = 17.75, p < .001$ , partial  $\eta^2 = .082$ , indicating a moderate effect size, and a smaller but significant effect on purchase intention,  $F(1, 198) = 4.14, p = .043$ , partial  $\eta^2 = .020$ . No significant effects of Label emerged for the remaining dependent variables. Descriptive statistics show that Nutri-Score is associated with higher perceived healthiness than NutrInform Battery ( $M = 4.18$  vs.  $M = 3.28$ ). Differences between the labels for the remaining variables are limited, in line with the non-significant univariate results. This result is consistent with the heuristic nature of directive labels, which provide a simplified evaluative cue that consumers can process quickly during product evaluation.

**Discussions.** This study investigated the effects of different types of front-of-pack nutrition labelling on consumers' responses to a food product and its brand, focusing on the interaction between label format and brand type. The findings confirm that FOPLs primarily act as informational cues that increase perceived product healthiness, with Nutri-Score outperforming NutrInform Battery. Behavioural outcomes such as purchase intention are only modestly affected, and no significant differences emerge for broader brand-relationship indicators (attitude, trust, loyalty, word-of-mouth). This result suggests that the impact of FOPL manifests itself mainly at the perceptual and cognitive level, influencing perceptions in the short term, while broader and relational evaluations related to the brand or retailer tend to remain relatively stable. Therefore, the inclusion of heterogeneous variables allows us to grasp how different labeling formats can influence distinct levels of consumer response: from product evaluations to brand inferences, up to possible repercussions on brand-related outcomes.

A further result concerns the absence of significant Brand and Brand  $\times$  Label effects, which indicates that, in this setting, FOPLs operate largely at the product-category level rather than as brand-differentiating tools. In a market where FOPLs are not yet institutionalized, consumers seem to use them as generic nutritional shortcuts instead of brand-specific signals. The distinction between directive and non-directive labels helps to interpret this evidence. Directive systems, such as Nutri-Score, reduce cognitive effort by offering concise and immediate evaluation, thus being more effective in rapid product evaluations. On the contrary, non-directive labels, such as the NutrInform Battery, require more analytical processing and may be less incisive in immediate evaluations, but potentially more relevant from a retailer and strategic positioning perspective, as they can help communicate greater information transparency, nutritional expertise and support consumers in choosing between comparable alternatives. Overall, the results suggest that FOPL can contribute to strengthening the perception of healthiness and supporting consumer decision-making, without generating strongly differentiated effects on the other dimensions considered.

**Conclusions.** This exploratory study examines the role of front-of-pack (FOPL) nutrition labels in the process of consumer evaluation of food products. The results show that the presence of FOPL represents a relevant information element in the product evaluation process, contributing in particular to influencing the perception of food healthiness. At the same time, the differences between the different labelling formats are generally small, suggesting that these tools operate mainly as information aids that facilitate the interpretation of nutritional information by consumers.

However, it is important to underline that the experimental design made use of controlled stimuli represented by fictitious marks, a choice that allowed to guarantee a high internal validity of the analysis. Future studies could extend the investigation to real market contexts, comparing the effectiveness of FOPL between private labels and industrial brands present on the market, to verify whether brands characterized by different levels of notoriety and brand equity can moderate the impact of different nutrition labels on consumer evaluations.

Overall, empirical evidence supports the role of FOPL as cognitive and evaluative levers, capable of influencing short-term variables, such as the perception of product healthiness, brand attitudes, and purchase intention. At the same time, it is important to investigate how these labels can also affect long-term relational dimensions for retailers, for example in terms of loyalty to the brand or adherence to loyalty programs. Further research could also analyze more deeply the cognitive and attitudinal mechanisms through which the perception of healthiness translates into a greater purchase intention.

This research contributes to the literature by outlining differentiated effects between directive systems (such as the Nutri-Score) and non-directive systems (such as NutrInform Battery) and opens more advanced perspectives on the strategic role of retailers in contexts characterized by the absence of mandatory regulation of FOPL. In these contexts, the voluntary choice of specific labelling formats can be a significant distribution lever: retailers can adopt FOPL not only to provide nutritional information, but also to signal a commitment to health and transparency, differentiating their offer from competitors and strengthening perceptions of responsibility towards consumers. In this perspective, FOPL can take on managerial value, potentially contributing to influencing purchase intent and loyalty, particularly in the case of private labels. Future research could therefore quantify these effects in real competitive contexts, characterized by shelf competition dynamics between different brands and labeling formats.

Finally, the results of the study can also offer useful indications to policy makers, helping to deepen the role of FOPL in promoting healthier and more informed food choices, enhancing the complementarity of information between the different labeling systems. Extending the analysis to different geographical contexts, including countries where FOPL are not yet widespread or institutionalized, would allow for a comparative perspective that would provide relevant insights for both public decision-makers and distribution operators.

In summary, this study strengthens the evidence on the effectiveness of FOPL as tools to support more informed consumption choices, while paving the way for future research aimed at consolidating not only their information potential, but also their strategic and competitive value for companies and institutions.

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**Appendix – Reliability of tested scale**

| Construct                                   | Items                                                                          | Cronbach's alpha | Reference                                   |
|---------------------------------------------|--------------------------------------------------------------------------------|------------------|---------------------------------------------|
| Perceived Healthiness (HEA)                 |                                                                                | .924             | Mazzù et al., 2021                          |
|                                             | I expect this product to be healthy                                            |                  |                                             |
|                                             | I would consider this product to be good for me                                |                  |                                             |
|                                             | This product looks healthy                                                     |                  |                                             |
| Perceived Tastiness (TST)                   |                                                                                | .893             | Mazzù et al., 2021                          |
|                                             | How much do you think you will like this product?                              |                  |                                             |
|                                             | How savoury and flavourful do you think this product will taste?               |                  |                                             |
|                                             | How much do you want to taste this product?                                    |                  |                                             |
| Attitude toward the brand (ATT)             |                                                                                | .950             | Mitchell et al., 1981; Spears & Singh, 2004 |
|                                             | I have a favorable opinion of this food brand                                  |                  |                                             |
|                                             | I like this food brand                                                         |                  |                                             |
|                                             | This food brand is appealing to me                                             |                  |                                             |
|                                             | This food brand gives me a positive impression                                 |                  |                                             |
|                                             | Overall, my attitude toward this food brand is positive                        |                  |                                             |
| Brand Trust (TR)                            |                                                                                | .808             | Delgado-Ballester, 2004                     |
|                                             | This brand inspires trust in me                                                |                  |                                             |
|                                             | This brand's products are reliable                                             |                  |                                             |
| Purchase Intention (PI)                     |                                                                                | .929             | Mazzù et al., 2021                          |
|                                             | I would like to try this product                                               |                  |                                             |
|                                             | I would seriously consider buying this product                                 |                  |                                             |
| Word-of-Mouth (WOM)                         |                                                                                | .962             | Mazzù et al., 2022                          |
|                                             | I am likely to spread positive word of mouth about this brand                  |                  |                                             |
|                                             | I would recommend the brand's product to my friends                            |                  |                                             |
| Retailer Brand Loyalty (RBL)                |                                                                                | .839             | Chaudhuri & Holbrook, 2001                  |
|                                             | I intend to continue shopping at this supermarket in the future                |                  |                                             |
|                                             | This supermarket would be my first choice for grocery shopping                 |                  |                                             |
|                                             | I am likely to keep buying groceries from this supermarket                     |                  |                                             |
|                                             | I would not easily switch to another supermarket                               |                  |                                             |
| Loyalty Program Enrolment (LPE)             |                                                                                | .974             | Yi & Jeon, 2003                             |
|                                             | I would be willing to join this supermarket's loyalty program                  |                  |                                             |
|                                             | I intend to sign up for the loyalty program offered by this supermarket        |                  |                                             |
|                                             | If available, I would probably enroll in this supermarket's loyalty program    |                  |                                             |
|                                             | I would consider becoming a member of this supermarket's loyalty program       |                  |                                             |
| Familiarity with the product category (FAM) |                                                                                | .776             | Park et al., 1994                           |
|                                             | How informed are you with different types/ brands of cereal?                   |                  |                                             |
|                                             | How would you rate your knowledge of branded product relative to other people? |                  |                                             |
| Private label usage (PLUse)                 |                                                                                | .886             | Ailawadi et al., 2001                       |
|                                             | I regularly buy supermarket-brand products                                     |                  |                                             |
|                                             | I look for supermarket-brand products when I go grocery shopping               |                  |                                             |
|                                             | Buying supermarket-brand products encourages me to shop there more often       |                  |                                             |