Title of the Presentation

# Front-of-Pack Nutritional Labels, consumer food choices, and diet quality: a basket-based Choice Experiment in Italy

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## Introduction

Nutritional labelling represents one of the main instruments to inform consumers about the characteristics of the food they eat. There are various forms of nutritional labelling, which include the Nutrition Facts Panel, nutrition and health claims, as well as different Front-of-Pack Nutritional Labels (FOPNLs). The latter are meant to facilitate consumers' understanding of the nutritional characteristics of foods. They can be classified into two main types, that differ both in terms of design and amount of information reported. Reductive FOPNLs, such as the Reference Intake (RI), convey a subset of the information presented in a more extended form in the Nutrition Facts Panel, enhancing their visibility through the positioning in the front of the package. In contrast, interpretive FOPNLs, like the French Nutri Score (NS) or the UK's Multiple Traffic Light (MTL), utilize symbols or logos, often accompanied by color coding, to provide a summary assessment of the product's healthfulness.

Evidence shows that FOPNLs can effectively guide consumers toward healthier product alternatives. Therefore, they have been increasingly adopted worldwide over the past decade. Many studies have investigated the effects of different FOPNLs to assess which is best among numerous available schemes. However, results in this regard are still mixed and there is no consensus on which FOPNL is more effective in guiding consumers towards healthy food choices.

Given the relevance of this issue for promoting consumers' health, it is crucial to extend knowledge on this topic providing novel results that can support future food policy implementation.

This study investigates the effects of different FOPNLs on consumers' food choices. This study focuses on two of the most popular FOPNLs, namely the French NS, whose adoption is rapidly spreading across EU countries, and the UK's MTL, extensively studied in the past and considered one of the most effective labels in promoting healthier food consumption.

The aim of this study is to explore and compare the effectiveness of the NS and MTL in (i) changing the food basket composition both in terms product quality and quantity purchased, and (ii) consequently, in changing the overall nutritional quality of consumers' food choices. Additionally, we explore whether the presence of a FOPNLs affects (i.e., reduces/increases) consumers' use of the mandatory Nutrition Facts Panel.

This study extends current knowledge in several ways. Firstly, the results are expected to provide novel insights on the effectiveness of different FOPNLs, contributing to clarify previous mixed results. Focusing on the MTL and NS, and exploring whether the presence of FOPNLs on food products affects consumer use of the Nutritional Facts Panel, the study also contributes to the scientific debate regarding the importance of balancing label simplicity with informational depth. Moreover, the analysis adds to the literature with a methodological contribution. By implementing a basket-based Choice Experiment, the study provides insights for further developments of this methodological approach, as an alternative to common Discrete Choice Experiments.

## Methods

This study is based on an online Basket-Based Choice Experiment aimed at investigating how the presence of the NS and the MTL FOPNLs affect consumers' food choice behavior. Our experimental design is similar to a large extent to the Basket-Based Choice Experiment methodology recently developed by Caputo and Lusk (2022). Their approach overcomes the main limitations of classic Discrete Choice Experiments, where respondents are asked to make repeated mutually exclusive choices of single items, out of a set of available alternatives. In contrast the basket approach, allows respondents to pick any combination of foods, making the experiment more similar to a real-life shopping experience and allowing explore complementarity/substitution patterns across different product alternatives. In this study, we build on Caputo and Lusk (2022) adding the possibility for respondents to choose not only their bundle of foods, but also the desired quantities of the selected products.

The study involves a sample of 2000 Italian households (representative of the Italian population) and uses a within-subject design, where each respondent completes two subsequent shopping tasks. In the first task no FOPNL is displayed, but respondents can click if they would like to visualize the Nutrition Fact Panel of the product. In the second task, respondents repeat the experiment visualizing the NS or the MTL associated with each product. Respondents are randomly and evenly assigned to either the NS or MTL condition. As in the first task, consumers can click if they would like to consult the Nutrition Facts Panel.
The experimentally designed basket includes 33 food items covering all the main food categories (e.g., cereals, fruits and vegetables, meat, legumes, sweets, etc.). Each food item has three price levels, defined according to the prices in the Italian market. The allocation of the price levels in each task was determined through an orthogonal fractional factorial design.
Before starting the shopping tasks, respondents are assigned a hypothetical budget based on the average weekly expense for grocery shopping as provided by the Italian Institute of Statistics and tailored to the size of the household. Respondents are asked to make their choices by selecting the food items they would consume in one week, subject to the budget constraint.
The data are being modelled via the multiple discrete continuous extreme value (MDCEV) model (Bhat, 2008). This allows us to estimate the effect of the two labels on the baseline (i.e., at zero consumption level) utility and the satiation effect (i.e., how rapidly utility decreases at increasing consumption) for each of the food items. The estimated parameters will also allow to simulate demand curves for each food item in the different treatments. Comparison across estimates and demand curves in each treatment will allow investigating the label effects.

**Preliminary results**

The preliminary results suggest that the presence of both the MTL and the NS is able to shape respondents' food choices, both in terms of items and quantity purchased. This emerges when analyzing the basket composition of the two shopping tasks completed by each respondent, respectively without and with FOPNLs. The label effects are visible both in the MTL and the NS conditions. However, when comparing the two labels, further and more detailed differences emerge.
According to the preliminary analysis, the MTL seems to increase the choice probability of some healthy options (e.g., such as whole grain cookies, fresh fruit and vegetables) but it has limited effect in discouraging respondents' choice of less healthy foods. The NS seems to have an opposite effect: it is more effective than the MTL in discouraging purchase of the least healthy options in the basket, but it seems to have no effect in changing the choice probability of healthy foods. These results are not final and further data analysis is needed to assess the size of the FOPNL effects. The analysis will also be extended to investigate whether the presence of a FOPNL affects respondents' use of the mandatory Nutritional Facts Panel and whether the effect differs depending on the FOPNL design.