

The compliance of French purchasing behaviors with a healthy and sustainable diet: a 1-yr follow-up of regular customers in hypermarkets

Research Paper

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Abbreviations:

3V rule: 'Végétal' (plant); 'Vrai' (real); 'Varié' (varied); PCA: principal component analysis; RVI: relative variety index; UPF: ultra-processed food

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Abstract

In France, hypermarkets are the main shopping sites for food products. Therefore, the food-purchasing profiles of their regular customers may be a relevant indicator of the sustainability and health potentials of consumed diets. Knowing this information can be a step to address the issue of global health. The main objective of this study was to assess the sustainability and health potential of food-purchasing behaviors among regular adult customers, with or without children, of a leading French retailer. Secondly, the cost of a sustainable food shopping cart was evaluated as regards the regular one, as calculated in this study. Purchasing receipts corresponding to 38,168 different food products were collected during one consecutive month for each four seasons in 2019 to assess compliance with a newly developed holistic indicator of food system sustainability, i.e., the 3V rule, recommending food consumption to be 'Vegetal'/plant-based ($\approx 15\%$ animal calories/day), 'Vrai'/real (max. 15% ultra-processed food calories/day, UPF) and 'Varié'/varied. Participants were 708 regular buyers (aged ≥ 18 with different socio-economic profiles, with and without children) in 122 French hypermarkets. The plant rule was based on the animal and plant origin of food ingredients, including mixed products; the 'real' rule was evaluated with the Siga score according to the degree of processing to identify UPFs. The varied rule was defined based on a combination of food 'categories \times families'. The effect of children and season on the purchased animal and UPF calories and on the variety index was also evaluated. Multivariate and decision tree analyses were applied to compare consumers for their 3V rule profile similarities and differences, and to look for impacts of the presence or absence of children. Customers' purchases were far from the 3V rule, with a median of 41% animal and 61% UPF calories and a median variety index of 25% (compared to the consumer with the highest index set to 100%). There was no difference in purchased animal and UPF percentages neither according to seasons nor the presence of children. However, the presence of children was associated with a higher variety index (+33%, $P < 0.05$). Finally, the more the consumers purchased varied, the less they purchased UPFs. Compared to the average food basket, a 3V-based basket would cost 4.6% less. To make this basket accessible to everyone and to orientate consumer's purchasing behaviors toward more sustainable and healthier products, and hence food systems, hypermarkets should promote healthy eating and reassess their food offerings.

Introduction

At this time, behavioral change toward the purchase and consumption of healthier and more sustainable food products is a crucial issue to address (Benedetti *et al.*, 2018; Schöslér and de Boer, 2018). Indeed, most food systems are no longer sustainable at a global level (FAO and WHO, 2019). Notably, excessive consumption of animal products and ultra-processed food (UPF), associated with the lack of variety in diets, may threaten human health, animal and plant biodiversity and the environment as a whole (Fardet and Rock, 2018). The qualitative 3V rule provides a simple metric for assessing the healthiness and sustainability of consumer food choices, with the three V's standing in French for 'Végétal' (plant-based), 'Vrai' ('real' foods, i.e., not ultra-processed) and 'Varié' (varied) (Fardet and Rock, 2018, 2020a, 2020b). It is based on three indicators of the relation between diet and global health: the plant/animal caloric ratio, with an optimum of $\approx 15\%$ animal calories/day; the degree of processing, with a maximum of 15% ultra-processed calories/day; the diversity of the diets—if possible organic, local and seasonal.

Through its holistic approach, this three-dimensional metric has been built from eight previously identified health protective diets worldwide (including the Mediterranean, Prudent and Okinawa diets), and eight foresight scenarios at horizon 2050 for protecting both