

COMMENT PREVENIR L'EFFET DE HALO SANTE DES PRODUITS BIOLOGIQUES ? L'INFLUENCE D'UN SYSTEME D'AFFICHAGE DE LA QUALITE NUTRITIONNELLE DES ALIMENTS

The market of organic foods has constantly expanded in France and in Europe. In Europe, 6.7% of the land used for agriculture is dedicated to organic products and the market was worth 30.7 billion euros in 2016 (a 47.7% increase between 2012 and 2016)¹. The European Parliament (2015) defines organic production as “an overall system of farm management and food production that aims at sustainable agriculture, high-quality products and the use of processes that do not harm the environment, or human, plant or animal health and welfare”. Organic labels have an overall positive effect on product perceptions (e.g. Schuldt & Hannahan, 2013; Prada, Garrido & Rodrigues, 2017). The main motivation to buy organic food concerns its health benefits (Agence Bio, 2019; Hughner *et al.*, 2007), due to the avoidance of synthetic chemical inputs (e.g., fertilizers, pesticides, antibiotics). However, past research identified a health halo effect of organic labels: consumers extend their positive judgment to attributes unrelated to these real health benefits, such as nutritional quality and calorie estimation (Besson *et al.*, 2019; Lee *et al.* 2013; Schuldt & Schwarz, 2010).

It is important to understand how to diminish this halo effect because it can bias behavior: consumers may mistakenly consume more of low nutritional quality food by the mere fact that it is organic. Previous research shows that health halo effects can be mitigated when individuals are asked to question the validity of the health prime (Chandon & Wansink 2007). This research proposes that nutritional information, such as Front-Of-Packaging (FOP) simplified nutritional systems, can help consumers to judge nutritional quality and, thus, can be an effective way to minimize the health halo effect of organic food. We examine this question by looking at the effect of the Nutriscore label (ANSP, 2017). This nutritional system was recently adopted in France and other countries in Europe and classifies foods into five nutritional quality levels, from A (Green) to E (Red). They are calculated using the Foods Standards Agency nutrient profiling system (FSA Score), which considers levels of fat, sugar, salt, fiber, and protein. Previous research shows that this system is effective in influencing choice towards healthy foods (e.g., Ducrot *et al.*, 2016; Julia *et al.*, 2016; Werle *et al.*, 2018).

Our objective is twofold: (1) to validate the organic health halo effect in France and (2) to examine whether the Nutriscore can attenuate this effect. We are particularly interested on how a negative nutritional quality level such as the Nutriscore grade E will influence responses to food products when labeled as organic. To do so, we performed two experimental studies. Study 1 investigates the effect of an organic label on nutritional quality and calorie content perceptions, confirming the health halo effect of organic food. It also investigates how the presence of a Nutriscore rating (A or E) can mitigate this effect. Study 2 investigates the health halo effect of an organic label on another dependent variable—recommended frequency of consumption. This last study also assesses how the perception of an organic unhealthy product is influenced by the presence of the corresponding Nutriscore label (rating E).

¹ <http://www.europarl.europa.eu/news/en/headlines/society/20180404STO00909/the-eu-s-organic-food-market-facts-and-rules-infographic>

Literature review

The health halo effect of organic food

Although organic foods are produced through processes that do not harm the environment, the organic label does not objectively influence calories estimation and nutritional quality of processed food. However, several studies underline that consumers overestimate the nutritional quality of such products and underestimate its calorie content (e.g., Besson *et al.* 2019; Schuldt and Schwarz 2010). This characterizes a health halo effect through which one's general judgment of an object is influenced by one salient attribute of this object. Schuldt and Schwarz (2010) showed, for example, that an organic food product is perceived as containing fewer calories than a non-organic equivalent. More recently, Besson *et al.* (2019) replicated their findings. Further, individuals high in pro-environmentalism are more subject to this halo effect (Schuldt & Schwarz, 2010, study 1). This health halo of organic food persists when consumers taste the food. Across three product categories (cookies, potato chips, and yogurt), Lee *et al.* (2013) show that the organic label leads to better nutritional evaluations (tastes lower in fat, higher in fiber and is more nutritious) in comparison to the same product without the label. The health halo effect of organic food also extends to consumption intentions: the organic product is deemed more appropriate to be eaten often (Schuldt & Schwarz, 2010; Besson *et al.*, 2019). The use of a nutritional-labeling system could be a plausible debiasing strategy.

The influence of nutritional-labeling systems on health perceptions

Given the raise of obesity, several countries are adopting nutritional systems that provide objective information about the nutritional quality of food products in a simplified manner. There is initial evidence that FOP nutritional systems work. Thorndike *et al.* (2012) show that a traffic-light system influenced food choices in a large hospital cafeteria, increasing the choice of healthier food options diminishing the choice of unhealthy ones. Recently, public policy makers in Europe adopted a simplified FOP nutritional system, the Nutriscore (ANSP, 2017). The Nutriscore classifies foods into five nutritional quality levels, from A (Green) to E (Red). They are calculated using the Foods Standards Agency nutrient profiling system (FSA Score), which considers levels of fat, sugar, salt, fiber, and protein. Previous research show that this system was effective in influencing choice of healthy foods (e.g., Ducrot *et al.*, 2016; Julia *et al.*, 2016; Werle *et al.*, 2018). The present research investigates how the presence of a FOP nutritional quality system such as the Nutriscore influence consumers' responses to organic labels. We propose that the health halo effect of the organic label will be minimized when accompanied with a FOP nutritional system indicating the product's nutritional quality.

Study 1

Methodology

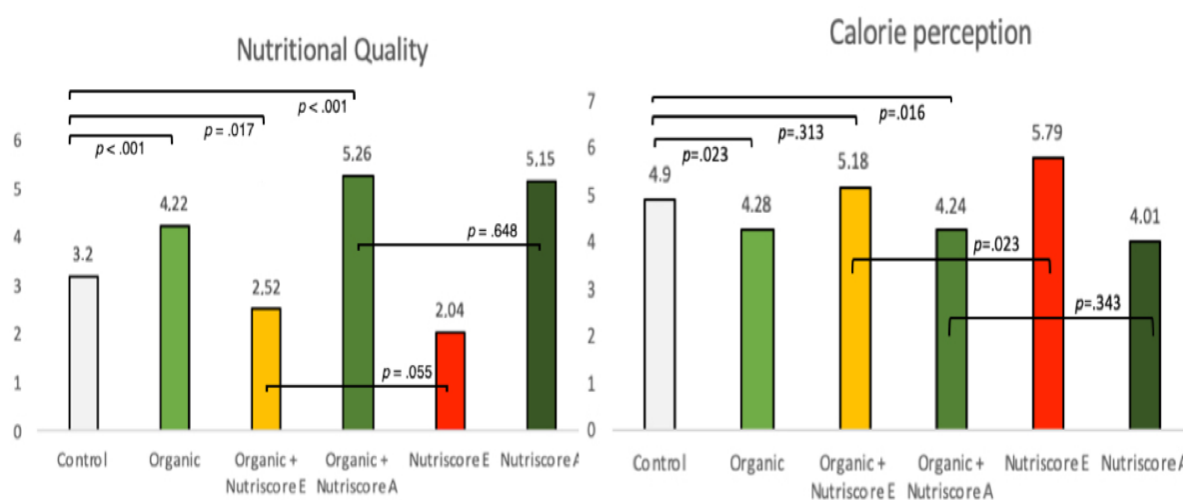
We conducted an online experiment with 353 French consumers (73.4% women, 70.5% ≤ 35 years old). In terms of organic shopping behavior, 24.9% indicated to purchase organic foods several times a week, 38.5% several times a month, and 5.7% never.

We created 6 versions of a breakfast biscuit packaging (no label, organic label, organic label+Nutriscore A, organic label+Nutriscore E, Nutriscore A, Nutriscore E; see appendix 1) and each participant was randomly exposed to one out of the six packaging conditions. We chose the breakfast biscuits' category because its Nutriscore ranges from A to E. As for the organic label, we preferred the French instead of the European label, because of its higher awareness among French population (97% vs 62% in 2018; Agence Bio, 2019). To be sure that consumers understood what the Nutriscore is, its meaning was explained before the breakfast biscuit packaging was presented (only in the conditions where the Nutriscore label was present). After packaging exposure, we measured perceptions of nutritional quality (i.e., 1=low nutritional quality; 7=high nutritional quality), calorie content (1=not at all caloric; 7=very caloric), and demographics.

Results

Results show a significant difference on nutritional quality ($F(1,352)=58.43, p<.001$). The organic biscuit is perceived as having higher nutritional quality ($M_{\text{organic}}=4.22$) than the non-organic one ($M_{\text{control}}=3.20, p<.001$), replicating the organic health halo effect documented in previous work. When adding the Nutriscore E, this health halo disappears ($M_{\text{organic+NutriscoreE}}=2.52; M_{\text{control}}=3.20, p=.017$). However, when adding the Nutriscore A, nutritional quality perceptions are higher ($M_{\text{organic+NutriscoreA}}=5.26; M_{\text{control}}=3.20, p<.001$). The Nutriscore E label alone ($M_{\text{NutriscoreE}}=2.04$) decreases nutritional quality in comparison to other conditions ($M_{\text{control}}=3.20, p<.001; M_{\text{organic}}=4.22, p<.001; M_{\text{organic+NutriscoreE}}=2.52, p=.055; M_{\text{organic+NutriscoreA}}=5.26, p<.001; M_{\text{NutriscoreA}}=5.15, p<.001$), while the Nutriscore A label alone ($M_{\text{NutriscoreA}}=4.84$) increases nutritional quality perceptions in comparison to other conditions (all p 's<.001), except the organic+Nutriscore A label ($M_{\text{organic+NutriscoreA}}=5.26, p=.648$). We found the same pattern of results for calorie content perception (Figure 1). Interestingly, the organic biscuit with a Nutriscore E is perceived as significantly less caloric than the same biscuit without the organic label ($M_{\text{organic+NutriscoreE}}=2.52; M_{\text{NutriscoreE}}=2.04, p=.023$).

Figure 1. Nutritional quality and calorie content perceptions



Study 1 provides initial evidence that the Nutriscore influences nutritional quality and calorie perceptions of organic food and can mitigate the organic health halo effect. This first study shows that adding a negative Nutriscore rating such as E can eliminate the health halo effect of organic food when comparing the product without any information and the product with the organic and the Nutriscore labels. However, we can also note that when comparing two products with a Nutriscore grade E, the organic one is still perceived as less caloric.

In study 1, the Nutriscore meaning was explained to participants only in the Nutriscore conditions, leading to potential demand effects. In study 2, no information about the Nutriscore was provided to participants. In addition, we extended our results to recommended frequency of consumption on another product category.

Study 2

Methodology

We created four versions of a cereal bar packaging (no label, organic label, organic label+Nutriscore E, Nutriscore E; appendix 1). In a lab experiment, two-hundred one French undergraduates (57.2% women, $M_{\text{age}}=20.15$) were randomly exposed to one out of the four conditions. After exposure, a questionnaire measured recommended frequency of consumption (“*In comparison to other bars, how frequent the bar that you just saw should be consumed?*” 1=less frequently; 7=more frequently) and calorie content (“*In comparison to other bars, how caloric do you think that the bar that you just saw is?*” 1=less caloric; 7=more caloric); both measurements coming from Schuldt & Schwarz (2010). We also measured nutritional quality (equal to Study 1), demographics and controlled for Nutriscore familiarity (“*Please, indicate your level of familiarity with the Nutriscore*” 1= not at all familiar; 7 = very familiar).

Results

Results show a significant difference on nutritional quality ($F(3,197)=33.759, p<.001$). Participants rate the organic bar ($M_{\text{organic}}=4.18$) as of higher nutritional quality than the non-organic one ($M_{\text{control}}=3.32, p=.002$). When adding the Nutriscore E, the halo effect disappears ($M_{\text{organic+NutriscoreE}}=2.31; M_{\text{control}}=3.32, p<.001$). Also, the presence of Nutriscore label alone ($M_{\text{NutriscoreE}}=1.55$) decreases nutritional quality perceptions in comparison to all other conditions ($M_{\text{control}}=3.32, p<.001; M_{\text{organic}}=4.18, p<.001; M_{\text{organic+NutriscoreE}}=2.31, p=.007$). Interestingly, when comparing the two products with Nutriscore E, the organic label can still enhance nutritional quality perceptions. Again, we found the same pattern of results for calorie content perception.

We also found a significant difference on recommended frequency of consumption ($F(3,197)=16.26, p<.001$). Participants report that the product should be consumed more often in the organic ($M=4.29$) than in the control condition ($M_{\text{control}}=3.62, p=.014$). The health halo of the organic label disappears, however, in presence of Nutriscore E ($M_{\text{organic+NutriscoreE}}=3.69; M_{\text{control}}=3.62, p=.798$). Furthermore, the presence of Nutriscore alone ($M_{\text{NutriscoreE}}=2.40$) decreases participants’ perception of how often the product should be consumed in comparison to other conditions (all p ’s<.001). Again, when comparing the two products with Nutriscore E, the organic label can still enhance recommended frequency of consumption ($p<0.01$).

A mediation analysis (Model 4, Hayes & Little, 2018) entering packaging type as independent variable, nutritional quality and calorie perceptions as mediators, and recommended frequency of consumption as dependent variable shows that the organic label impact on recommended frequency of consumption is mediated by both nutritional quality ($ab=.232$, $CI_{95\%}:.075;.437$) and calorie perception ($ab=.121$, $CI_{95\%}:.006;.294$). Furthermore, when adding the Nutriscore beside the organic label, the reduced recommended frequency of consumption is also mediated by decreased nutritional quality ($ab=-.479$, $CI_{95\%}:-.788;-.225$) and calorie perceptions ($ab=-.186$, $CI_{95\%}:-.422;-.012$).

Study 2 confirms that the Nutriscore E mitigates the organic health halo effect and shows its influence on the recommended frequency of consumption. Participants exposed simultaneously to both the organic and the Nutriscore E labels perceive that the product should be consumed as often than those exposed to the same product without any information.

Conclusion

The present research confirms the health effect halo of the organic label in France on calorie estimations, overall nutritional quality, and recommended frequency of consumption for two processed food products (breakfast biscuits and cereal bars) and on two different samples.

This work is, to our knowledge, the first to test a debiasing strategy of organic health halo effect using a nutritional labeling system. We show that a FOP simplified nutritional system such as the Nutriscore could be an effective way to reduce this bias. In the presence of a Nutriscore E label, we find two interesting and consistent findings. First, adding the nutritional information to an organic product helps consumers to evaluate its objective nutritional quality: the organic product is then perceived as having the same calorie content, nutritional quality and recommended frequency of consumption than the product without any information – removing the health halo effect previously studied in the literature (e.g. Schuldt and Schwarz, 2010; Besson *et al.*, 2019). Second, a kind of health halo effect of organic food still occurs when comparing two products with the Nutriscore E label. In this case, when a product contains a Nutriscore E label, the organic one remains perceived as less caloric, as having better nutritional quality and being more deemed to frequent consumption than the same product containing the Nutriscore E label alone. It seems that there is a compensation effect in which the combination of vice (i.e. the Nutriscore grade E label) and virtue (i.e., the organic label) labels are perceived as “healthier” than a vice label alone (see Chernev and Gal, 2010), extending to other evaluations related to product healthiness. More research is needed on this mechanism.

In addition, further work could dig deeper into individual moderating factors. In their first study, Schuldt and Schwarz (2010) showed that the health halo effect of organic food occurred only for people with high environmental concern. Therefore, it could be of interest to reexamine the influence of this variable and the influence of the FOP nutritional information for those consumers. Finally, future work is warranted to investigate the conjoint effect of organic and nutritional labeling on real consumption behaviors.

Appendix 1. Manipulations

	Control	Organic	Organic+ Nutriscore E	Nutriscore E	Organic+ Nutriscore A	Nutriscore A
Study 1						
Study 2						

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