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## **How the Disclosure of Nutrition Information With Different 'Per-Serving Basis' Affects Sales Volume**

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This study analyzes how lower serving-size specifications on nutrition labels affects sales volume. After label introduction, sales for yogurts increased with lower serving-size specification. The objective healthiness of the products-which is meant to be disclosed-did not affect sales. Thus, nutrition labels can thwart their purpose of promoting healthier purchases.

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# How the Disclosure of Nutrition Information with Different ‘Per-Serving Basis’ Affects Sales Volume

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## EXTENDED ABSTRACT

Consumers pay ever more attention to nutrition content when choosing food products. Thus, voluntary front-of-pack nutrition labels have become popular communication tools for food marketers. While such nutrition information should help consumers to decrease calorie intake, food manufacturers and retailers can manipulate the presentation of relevant information to increase healthiness perceptions. A widespread strategy is health framing, the adoption of a smaller serving size on nutrition labels which decreases the reported amounts of calories and nutrients. The health-framing effect implies that consumers neglect the ‘per-serving basis’ and evaluate the healthiness of food products solely by the nutrition values disclosed on the label (Mohr, Lichtenstein, and Janiszewski 2012). As a result of lower serving-size specifications, consumers may have reduced anticipated guilt of consumption and, thereby, increase their consumption volume (Belei et al. 2012; Mohr, Lichtenstein, and Janiszewski 2012; Wansink and Chandon 2006). Mohr, Lichtenstein, and Janiszewski (2012) even found that respondents who were most focused on avoiding calories were more susceptible to health framing. This means that nutrition information-induced health framing can create health halos, where consumers will overestimate the healthiness of food products and underestimate the food’s energy content (Chandon and Wansink 2007). As a consequence, lower serving-size specifications can lead to overeating because consumers do not tend to consume the ‘per-serving basis’ (Ueland et al. 2009), but rather consume a single entity (Geier, Rozin, and Doros 2006) or a fixed share of the package size (Chandon 2013; Scott et al. 2008).

We hypothesize that the introduction of a front-of-pack nutrition label will increase sales volume of products with lower serving-size specifications. We further posit that this effect occurs in healthier categories, but not for less healthy categories. This prediction derives from previous research demonstrating that consumers tend to ignore nutrition information when buying indulging products, but use such information in healthier categories (Balasubramanian and Cole 2002; Nikolova and Inman 2015).

To test our contention, we analyze real purchases collected as supermarket scanner data. We compare purchase behavior of store brands before and after a voluntary front-of-pack nutrition label introduction, where the retailer had no restrictions in setting the ‘per-serving basis’ for the amount of nutrition content. Our study analyzes two food categories, yogurt and cookies. We have chosen these two categories based on data availability and to test our hypothesis that predicts effects in healthier categories (i.e., yogurt compared to cookies). We estimate two-way fixed effects models for each food category to account for unobserved heterogeneity of products and time periods. We supplement our models with price, time-dependence and the objective healthiness as control variables which can also affect sales volume next to the serving-size specification. In our models, we check for omitted variable bias and, furthermore, use a robust estimation procedure to account for heteroskedasticity and serial auto-correlation (Stock and Watson 2008).

Our results show that a lower serving-size specification on front-of-pack nutrition labels affects sales volume in the yogurt category. We observe that sales volume of yogurt products increased after label introduction when lower serving-size specifications were

chosen as basis for the disclosed nutrition amounts. Notably, the effect held after controlling for price, time-dependence and the objective healthiness as well as unobserved heterogeneity across products and weeks. Our findings reveal that consumers may be misled by the nutrition label information.

In line with our expectation, we show this effect prevails in the healthy product category. Specifically, sales volume was not changed significantly in the cookies category. This finding is in line with previous research indicating that consumers pay less attention to nutrition labels when they choose indulgent food products (Balasubramanian and Cole 2002), which would make consumers less susceptible to reduced serving-size specifications. As found by Mohr, Lichtenstein, and Janiszewski (2012), consumers who are most focused on avoiding calories are more susceptible to health framing. Accordingly, when consumers seek healthier options (as we expect consumers with yogurt) a lower serving-size specification will become more effective. By contrast, cookies predominantly are consumed for indulgence, where consumers seek taste rather than healthiness (Raghunathan, Naylor, and Hoyer 2006). In this situation, the nutrition information will be less useful in general. As a side effect, this will also impair the health-framing effect. Our results corroborate the results by Mohr, Lichtenstein, and Janiszewski (2012) in a ‘real world’ setting and additionally indicate that consumers purchased more when the serving-size specification was particularly small.

We conclude that lower serving-size specifications are a major threat to consumers who seek to choose healthier options by using nutrition labels but are, in fact, deceived by lower serving-size specifications. As a result, we emphasize the importance of public policy efforts towards higher regulation standards for (voluntary) nutrition labels regarding the ‘per-serving basis.’ Binding rules for the recommended serving size as basis for nutrition values are deemed necessary to prevent overeating induced by the health-framing effect. This should result in standardization for the serving-size specification on nutrition labels to increase comparability of food products regarding their healthiness. As long as food manufacturers and retailers have the possibility to apply health framing, more consumers have to be informed about such strategies to decrease susceptibility. Consumers should be strongly advised to double-check nutrition labels regarding the serving-size specification when choosing food products, and especially when comparing different food items.

Our research also suggests that future research should distinguish between nutrition labels as public policy tools or as part of firms’ food marketing. Particularly voluntary nutrition labels are introduced as a marketing strategy that can easily be used as a tool to manipulate perceived healthiness. The objectives and the according design of the labels differ substantially across the two implementations. As long as the design of nutrition fact labels does not fully aim to inform consumers about nutrition content in an easy-to-process way without room for manipulation, they will fall short of reaching their intended goal of promoting healthier purchase behavior.

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