

## Message in a Bottle: Experiments on Sustainability Labeling of Wine

Wine producers can strategically and significantly reduce their carbon emissions by switching from traditional heavy glass bottles to so-called climate-smart packaging (CSP). Making the shift to CSP requires a change in consumer behavior. However, the wine industry is inherently traditional and slow to change. Consumers might infer lower quality of wine on CSP (Delmas and Lessem, 2016; Luchs et al. 2010; Pancer et al., 2017) or miss sensory components that only come with traditional heavy glass bottles. Despite the importance of packaging for the industry's climate impact (Ferrara and De Feo, 2018), research is scarce on consumer preferences of wine on sustainable packaging (Barber, 2010; Nesselhauf et al., 2017; Schäufole & Hamm, 2017; Ferrara et al., 2020). A key question to understand is how producers and retailers alike can market wine products on CSP in a manner that caters to consumers' preferences. Providing consumers with information about the environmental impact of different packaging options, as well as their impact on wine quality, can be central to drive such behavioral change (e.g., Majer et al., 2022; White et al., 2019). A prominent type of providing such information is product labeling (Ölander & Thøgersen, 2014). Previous studies on the moderating effect of label characteristics suggest that the type of information and its visual presentation matter for persuading customers to purchase more sustainable products (Pancer et al., 2017; Brunner et al., 2018). This is particularly important for wine: Although wine has been recognized as one of the most challenging search environments due to the constant depth and breadth of products (Spence, 2020), there is minimal evidence of external search efforts by consumers.

This study investigates the effect of sustainability labeling on consumer behavior in the context of climate-smart packaging for wine. Hence, we address the call for research on effective informative communication of wine sustainability (e.g., Schäufole & Hamm, 2017) by answering two overarching questions. First, we address the question of how sustainability-related information influences consumers' intention to purchase wine on climate-smart packaging and how the effect is moderated by the information design. Second, we address the question of the degree to which the effect on intentions translates into actual purchase behavior.

We investigate these questions in a mixed-methods empirical design in collaboration with *Vinmonopolet* – the Norwegian Wine Monopoly. This empirical setting provides a unique opportunity for doing research on data of the whole national wine market and allows for natural field experiments where competition is constant and the traditional ties to wine are less regionally focused than in established wine producing countries such as France and Italy.

Through survey data (n=2070) and interviews (n=28) with Norwegian wine consumers, we shed light on drivers and barriers of the consumption of wine on CSP. We find that consumers are largely positive to sustainability improvements in wine packaging, but the sustainability characteristics of packaging do not seem to weigh heavily on consumers' choices (along with Dimara & Skuras, 2005). This neglect of packaging considerations might be due to the lack of knowledge regarding the environmental impact of packaging, especially in comparison to the impact of wine production. To the degree that consumers do choose wine on CSP, it is rather for practical reasons which supports the need for *green bundle* marketing (Delmas and Colgan, 2018). The main barriers regarding quality-related concerns are related to how packaging might influence taste as well as whether CSP allows for storage of wine without being detrimental to its quality.

In a lab experiment (n=453), we investigate the effect of using either binary positive (green/none) or graded relational (green/yellow/red) labeling to communicate the sustainability

characteristics of wine packaging on the intention to purchase such wines. Participants were presented with twelve similar wines, of which six were contained in heavy glass bottles, three in light glass bottles (CSP) and three in plastic PET bottles (CSP). We find that, for the respondents who notice the label, both labels can be associated with respondents choosing wine on climate-smart packaging rather than similar wine in conventional packaging.

It is important to supplement revealed-preference data with data on actual choice settings, both since the real choice has actual consequences for the respondent and because norms might be activated more strongly in an actual choice setting (cf. Levitt & List, 2007). Hence, we conduct a natural field experiment during the implementation of a binary sustainability labeling scheme in the online shop of the Norwegian Wine Monopoly. Sales data was collected for 13,411 products for one year (July 2023 – July 2024), grossing a revenue of over 4 million Euros. The data is yet to be analyzed. A second field experiment with a graded labeling scheme will be conducted in fall 2024, with a six-week period of randomized treatments (no label vs. graded labeling).

Taken together, these studies allow us to provide unique empirical insight into the effect of sustainability labeling on consumer intentions and purchase behavior of sustainable wine. Furthermore, these findings have practical implications for business communication and policy strategies to stimulate consumers' willingness to purchase wine on climate-smart packaging.

Finally, some limitations must be considered. Firstly, applying the label intervention in the physical store could provide more comprehensive data. Secondly, promoting a green bundle could be more effective in nudging consumers. However, our empirical setting does not allow for such interventions. Potential follow-up studies in the lab could supplement this aspect.

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