Consumers' views on virtual fencing and insights on a multi-level biodiversity labeling scheme for pasture-raised beef

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Abstract – Whereas the share of cattle grazing on grassland is decreasing in Europe, innovative grazing management systems applying virtual fencing can optimize and promote grassland use. Cattle grazing supports ecosystem services and biodiversity while providing valuable pasture-raised beef and dairy products. To stimulate consumer demand for such products, communicating the benefits of grazing-based production, e.g. through labeling, is vital. Yet, we know little about consumer perceptions of virtual fencing and of labels designed to certify the biodiversity benefits of cattle products. Thus, we aimed to explore consumer perceptions, understanding, and acceptance of virtual fencing in cattle pasturing and of a multi-level labeling system for beef from biodiverse grazing systems. We conducted two qualitative studies with 60 German consumers. Think-aloud protocols demonstrated the participants' general support of pasturing, scepticism about virtual fencing and doubts about the advantages from a specific grazing management practice. Online focus groups revealed significant challenges to the implementation of biodiversity labeling, yet highlighted consumers' appreciation for biodiversity conservation at local level, hinting at perspectives for selling local beef, and the need for policy action to encourage livestock practitioners to conserve and promote biodiversity.

INTRODUCTION

In view of continuous biodiversity loss in Europe, a downward trend in the share of cattle grazing on pasture is alarming (Van den Pol-van Dasselaar et al., 2020). In attempt to counteract this development and to promote cattle pasturing, an innovative grazing management technology of virtual fencing (VF) is currently being tested in Germany. Grazing management using VF can optimize grassland use to reduce the food-feed competition and enhance biodiversity on pastures and in environmentally sensitive areas (Campbell et al., 2020). Consumer demand for pasture-raised beef and dairy products can encourage farmers to adopt or expand cattle pasturing and depends on consumer perceptions of the VF technology as well as its benefits for animal welfare, biodiversity conservation and for consumers personally, e.g., product taste and quality (Gassler et al.,2018, Tinch et al., 2018).

In earlier studies, experts were concerned about the public perception of digital technologies in farming (Eastwood et al., 2017). However, since VF is novel in Germany, we lack consumer perspective on this technology. This fact urged us to instigate a study and answer the following questions: What do consumers think about VF? Would they support grazing systems applying VF? Considering consumers' unawareness about the environmental benefits of VF, informing them may be useful for its further implementation.

To inform consumers about the environmental benefits of food products, eco-labeling is commonly used. Whereas many eco-labels are binary (e.g. organic certification), multi-level labeling systems with different levels of provision (e.g. the EU egg labeling) maybe more suitable for continuous attributes like biodiversity. Although eco-labeling has been addressed in earlier research, little is known about consumer perception of multi-level biodiversity labeling. The closest example is a study on the development of a meat guide, in which a multi-level indication of biodiversity conservation and three other attributes were tested with interested Swedish consumers (Spendrup et al. 2017). The proposed indication of the attributes was perceived too complex for regular consumers.

Against this background, we conducted our second study, which addressed the following questions: How do consumers understand grazing, biodiversity, and pasture-raised products? How do consumers perceive a multi-level biodiversity labeling system? In the following, we provide a brief overview of the methods used and the results obtained.

METHODS

To address our research questions, we conducted two qualitative studies with German buyers of beef. In both studies we used age- and sex-based quota sampling and thematic text analysis (Kuckartz, 2014) to extract the meaning from the data.

The first study took place in three German cities in Fall 2019. Using think aloud protocols with 20 participants in person, we tested four information brochures about VF and the effect of grazing on biodiversity, landscapes, animal welfare and product quality.

In the second study, in Fall 2020, we conducted six audio-only online focus groups with 40 participants. A three-level biodiversity labeling scheme (fig. 1) was presented to the participants with a brief explanatory information regarding the conservation measures corresponding to each level.

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Figure 1. Multi-level labeling scheme tested in online focus groups.

RESULTS

Perception of virtual fencing in cattle grazing
Think aloud protocols demonstrated the participants' positive perception of pasturing. Whereas a few participants appreciated VF, most showed scepticism and concern about its effect on animal welfare and human safety. Our major finding was the difficulty in communicating to consumers the complex subject of VF technology and its benefits in a concise, engaging manner accessible for a layperson.

Perception of a multi-level biodiversity labeling scheme
Although consumers associate pasture grazing with high-quality beef and with valuable animal welfare and environmental attributes, they were rarely aware of the benefits of pasture-grazing for biodiversity. Participants found important that the conservation measures take place in their home regions. However, biodiversity was not a priority for most participants in their beef-purchasing decisions, often made under time pressure and based on heuristic clues. Participants reported difficulties differentiating between the levels of a label and perceived a multi-level approach excessive. Many participants expressed distrust related to the label's unfamiliarity and suspicions of greenwashing in the context of the abundance of eco-labels. In participants' words, pasture grazing itself stands for all its benefits and a simple "pasture-raised" label would suffice.

DISCUSSION AND CONCLUSIONS

Consumers do not generally appreciate VF due to the complexity of the subject. Considering the difficulties in communicating VF to consumers, the focus should be placed on the positive associations with pasture grazing that are of greater personal relevance for and higher valued by consumers, such as better taste, healthiness, and improved animal welfare (Gassler et al., 2018).

Communicating biodiversity benefits through a multi-level label and gaining consumer appreciation is challenging, given the low levels of involvement and knowledge about biodiversity, and time pressure. We found that the multi-level biodiversity labeling scheme confused the participants rather than being perceived as a decision-making aid. Thus, a multi-level biodiversity labeling scheme would likely have little to no success in engaging consumers currently uninvolved in eco-labeling. However, such labeling may well be appreciated by consumers already conscious of the effects of food consumption on biodiversity.

Since consumers desire biodiversity conservation measures at local level, there might be a perspective for selling local beef from biodiverse farms. Promising marketing of "biodiverse beef" and the expansion of biodiversity-friendly cattle pasturing should concentrate on the attributes highly valued by consumers. These are improved animal welfare and high quality rather than biodiversity. The results also indicate that biodiversity conservation will be difficult to ensure by changes in consumers' food purchase behavior alone. Compensation schemes are needed to encourage and remunerate farmers for adopting biodiversity-friendly methods and thereby increase the share of ethically produced meat on the market while reducing the decision-making load on consumers.

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