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COMMUNICATING THE BENEFITS OF AGROBIODIVERSITY ENHANCING PRODUCTS - INSIGHTS FROM A DISCRETE CHOICE EXPERIMENT

Introduction

Agrobiodiversity is one crucial aspect for functioning ecosystems and food supply (Ficiciyan et al. 2018; Ebert 2014). **An important component of agrobiodiversity are endangered varieties such as heirloom varieties.** A prominent strategy to safeguard heirloom varieties is their cultivation and preservation in their natural environment (*on–farm conservation*). Cultivating heirloom varieties often requires an additional effort from farmers as these varieties have a lower yield and higher labour costs. An additional demand and added value have to be created for farmers.
We want to investigate consumer-oriented communication approaches for heirloom varieties using a choice experiment.

Different approaches to communicate the added value of those varieties seem recommendable:

- A label "old variety" sets a focus on the age of a variety
- A label "red list variety" on its endangerment status
- A label "promoter of diversity" focuses less on the variety itself, but on more diverse agricultural systems and hence different varieties' (potential) contribution to a more diverse diet for consumers.

Research questions:
(1) Which communication approach for agrobiodiversity enhancing products such as heirloom varieties do consumers prefer?
(2) Do consumers have an additional willingness to pay for those labelled vegetable varieties?

Fig. 1: Carrot variety (Dana DeVolk on Unsplash)

Empirical Methods

We conducted an online survey with 708 participants in Germany in 2019. The questionnaire consisted of five parts, one of which was a discrete choice experiment.
Discrete Choice Experiment:
- method to analyse consumer preferences towards a certain product based on their preference towards specific attributes of that product (Hensher et al. 2015)
- based on **Lancester's "A New Approach To Consumer Theory"** stating that the utility of a product is derived from the sum of the utilities of the product attributes (Lancaster 1966)
- based on **Mc Fadden's Random Utility Theory** stating that consumers seek to maximise their utility when buying a certain product (McFadden 1974).
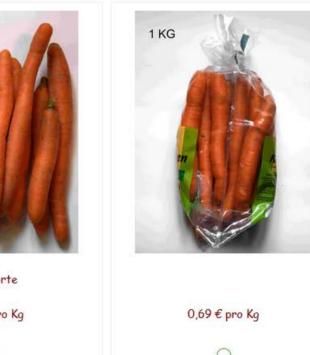
In our discrete choice experiment, we looked at different product attributes of carrots. We chose the following **attributes and attribute levels:**
- **price** per kilogram (0.69 €, 1.29 €, 1.89 €, 2.59 €) based on market prices in different food outlets (discounter, supermarket, organic supermarket and market stalls) and was set to increase by 60 ct. for each attribute level
- **packaging** (plastic packaging, paper packaging, no packaging) based on current packaging in different food outlets
- **label** representing the different communication approaches outlined in the introduction including a "no label" as status quo option.

Fig. 2: Example from the choice set (screenshot, questionpro)

Results and Recommendations

We performed **a mixed logit model** with the (hypothetical) purchase of the carrots as the **dependant variable and the price, package and label as independent variables**. We used dummy codings for the different attribute levels. The price was used as a fixed coefficient and the latter two as random coefficients (normally distributed). The attribute levels "plastic packaging" and "no label" were excluded from the model due to collinearity.
Comparing the three coefficients shows that **the labelled option "promoter of diversity" yields the highest utility for consumers**. According to Mc Fadden's Random Utility Theory, consumers are most likely to buy varieties with this claim, followed by the claims "red list variety" and "old variety".
Secondly, we estimated the Willingness to Pay as the quotient of the attribute parameter estimates over the cost parameter estimates (Hensher et al. 2015). **The label "promoter of diversity" revealed the highest WTP with 2.14 €.**

purchase	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
Mean						
old variety	0.532	0.191	2.9	0.006	0.156446	0.908783
red list variety	0.866	0.179	4.8	0	0.514457	1.218279
promoter of diversity	2.877	0.234	12.2	0	2.418427	3.337376

	old variety	red list variety	promoter of diversity
WTP	0.40 €	0.64 €	2.14 €

Table 1: Results from the Mixed Logit Model (depicting the results for the labels)

Table 2: Willingness to Pay for different labels

Therefore, **when communicating the benefits of heirloom varieties to consumers, the aspect of promoting diversity should be in focus** rather than the age of the variety or its endangerment status. The data suggests that **agrobiodiversity enhancing products can generate premium prices** at the point of sale when the communication approach focuses on the diversity aspect.

Literature

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