



183rd EAAE seminar

Zagreb, 8-9 September, 2022

**Experimental and Behavioural
Economics Research
in Agri-Food and the Environment**

BOOK OF ABSTRACT



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Session 1



Willingness to pay for improved forages and sustainable dairy development in Pakistan

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Abstract

Problem and relevance

The *smallholder's livestock production system (SLPS)* is characterized by an enormous number of geographically dispersed herders who lack financial capital, own low-yielding animals, and dwindling land resources for forage production. Inaccessibility of smallholders to quality seeds further exacerbates the feed availability constrained animal production conditions and dents the dream of transforming food and agriculture for resilient and sustainable societies (FAO, 2018). The recent statistics of Pakistan show that only 6.5 percent of cultivable land is available (~2.1 million ha) for fodder production, which requires 61,140 metric tonnes of seed. However, only 69.70 percent of this amount is available as certified seed, with ~50 percent contribution from imported hybrid seeds annually. The deficient access to certified seed at the production level translates into the enormous shortage of indigenous feed resources to fully meet the nutritional requirements of 213 million livestock and 1578 million poultry heads in the country. The reported supply and demand gap in nutritional requirements of livestock animals is increasing at an alarming rate, *e.g.*, for dry biomass (19.4 percent), crude protein (37.2 percent), and metabolizable energy (38 percent) in the country (Habib et al., 2016). This gap is increasing due to persistent demand for animal source food (ASF) with economic development, population growth, and changing food consumption patterns [habits] which propel improved livestock ownership in the country.

Adopting new forage varieties with improved agronomic practices can harvest up to 40 percent of yield losses (Hendrix & Glaser, 2007). However, the adoption of such welfare-enhancing forage varieties by *SLPS* remains sub-optimal in Pakistan. This low adoption is due to a lack of information, access to finance, and risk neutrality associated with the investment. The adoption decisions of a small livestock holder (*SLH*) for improved forage varieties depend on their *willingness to pay* for different crop attributes associated with livestock production traits. Cash crops are grown by farmers based on crop productivity. Instead, livestock farmers are most concerned about higher animal productivity translated into enhanced milk or meat production while feeding the animals improved forages [crop biomass]. Then, it is necessary to assess these forage crops' attributes and quantify their implicit prices. Hence, the present study was designed to understand the *SLH's* preferences for different livestock production-related traits of improved forages in distinct agro-ecologic areas of Pakistan. To the author's knowledge, this is the first study to assess the livestock smallholder's utility preferences for improved forage varieties in Pakistan.

Materials and Methods

In this study, we have designed a *discrete choice experiment (DCE)* model with selected project beneficiaries of the *United States Agency for International Development (USAID)*, which funded the *Agricultural Innovation Program for Pakistan (AIP)*. Data were collected during December

2017 in three different agro-ecologies (districts from provinces/administrative regions) of Pakistan, namely northern dry mountains (Gilgit from federally administrative regions), sandy desert (Bahawalpur from Punjab), and wet mountains (Swat from Khyber Pakhtunkhwa) with *SLH*. These areas are heterogeneous regarding climatic conditions, elevation, and topography. In terms of crop cultivation zone, Gilgit represents a double cropping zone in which maize, wheat, and a wide variety of vegetables and fruits can be cultivated (Hussain et al., 2021). While Bahawalpur falls under the cotton-wheat zone (Iqbal et al., 2002) and in Swat, wheat is grown predominantly along with fodders, gram, vegetables, and others (P&D KP, 2020).

The fodder crop attributes were constructed with the consultation of farmers, private seed companies' representatives, government officials, and AIP research scientists. Five attributes were considered the most important while adopting/purchasing new forage varieties (Table 1).

Table 1: Experimental design of the discrete choice model

| Attributes | Description | Units | Levels | | | |
|----------------------------|---|------------|--------|-------|-------|------|
| | | | L1* | L2 | L3 | L4 |
| Price | New seed variety price per kg | PKR | 300 | 700 | 1100 | 1500 |
| Animal productivity | Increase in milk production per day/animal above current production level | Litres | One | Two | Three | - |
| Crop maturity | Next forage cut available after first harvesting | Days | 25 | 35 | 45 | - |
| Multi-cuts | Total forage cuts throughout the crop cycle | Numbers | One | Three | Five | - |
| Distance | From livestock farm and input markets | Kilometres | <2 | 3-10 | >10 | - |

*Note: *base level of attributes.*

Conducting a discrete choice experiment

For the present study, the DCE design was generated using publicly available software from Burgess (Burgess, 2007). The fractional design contained 40 choice tasks, split into five blocks, determining five sets of 8 choice tasks each. This design allows independently estimating the main effects and all two-factor interactions at the sample level. Before running the experiment with the livestock farmers, we conducted a pilot survey with a convenient sample of AIP project beneficiaries (n=20) to validate the questionnaire's design and other socio-economic questions.

The choice sets cards were designed so that all the attributes and their levels were graphically visible and easily understandable to all the respondents. The respondents were randomly assigned one block of choice set cards to remove the block selection bias in estimating smallholders' WTP. Effects coding was used in the model design to avoid confounding between the constants of the baseline and the model (Bech and Gyrd-Hansen, 2005). The utility function for the design was:

$$U = f\{Price, Animal\ productivity, Crop\ maturity, Multi-cuts, Distance, \varepsilon\}$$

The characteristics of livestock enterprise may vary with the nature and quality of livestock production and the farmers' main objective of operation/production, *i.e.*, subsistence or market-oriented.

In total, 193 farmers participated in the study. Data were analysed using the R package "*mlogit*" (Croissant, 2020) on R 4.2.1. At first, a descriptive analysis was conducted to describe the general profile of the participants.

Regarding the DCE, the models were estimated from the choices made by participants, who performed eight choice tasks. Except for the price, all the other attribute levels were effects-coded. The first level of each attribute was set as the reference level.

One of the study's aims is discerning differences between regions. Then, choice attributes interacted with the region where the farmers are based. Thus, the interaction term of the region with the levels of each attribute is added to the utility function.

The utility parameters were calculated by integrating the data from DCE in the Multinomial Logit Model (MNL). The average willingness-to-pay (WTP) for each attribute level was calculated as follows:

$$WTP_i = -(\beta_i - \beta_{reflevel})/\beta_{price}$$

Where β_{price} is the parameter of price, β_i is the parameter for each level of the attributes, *i.e.*, animal productivity, crop maturity, multi-cuts, and distance. The $\beta_{reflevel}$ is the parameter for the attribute reference level.

Results

The parameter estimates of the MNL models for main effect variables are listed in Table 2. The null hypothesis is that all coefficients are zero. The no buy option is significant and has a negative coefficient, meaning that livestock farmers are interested in buying the choice 1 compared to the no buy options presented in the choice task. The Price coefficient is negative and significant, meaning that livestock farmers prefer less expensive options, all the other conditions being equal.

The livestock farmers have statistically significant preferences for increasing additional milk production. Regarding the speed of crop maturity of the forage, our results do not indicate any significance. For the number of cuts, farmers prefer a higher number of cuts. Finally, regarding distance (seed availability), livestock farmers prefer options closer to their farms.

Table 2: Results of multinomial logit model of main effects

| Levels | Coefficient | Levels | Coefficient |
|-------------------------------|-------------|------------------------------|-------------|
| Choice 2 | -0.05*** | Choice 3 (status quo) | -2.14*** |
| Crop maturity: 25 days | 0.04 | Multi-cuts: 1 cut | -0.71** |
| 35 days | -0.03 | Three cuts | 0.12* |

| | | | | | |
|---------------|----------------|----------|------------------|--------------|---------|
| days | 45 | -0.01 | Five cuts | 0.59*** | |
| Milk: | 1 litre | -0.22*** | Distance: | <2 | 0.28*** |
| litres | 2 | -0.09 | 3-10 | -0.22*** | |
| litres | 3 | 0.31*** | >10 | -0.06 | |
| Price | | -0.03*** | | | |

Note: *, **, and *** represent the 10%, 5%, and 1% significance levels, respectively. The effects coding,

The results of the willingness to pay for the main attributes (levels) are reported in Table 3. The SLH is willing to pay for new forage varieties that guarantee the highest biomass production and enhance animals' milk productivity compared to the current production level.

Table 3: Willingness to pay for improved forage seeds in Pakistani rupees (1 \$ =110 PKR at the time of the study)

| Attributes | Levels | WTP (Rs. /kg) |
|--|---------------|----------------------|
| Animal productivity (Ref level= 1 litre) | Two litres | 4.33 |
| | Three litres | 17.67 |
| Crop maturity (Ref level l= 25 days) | 35 days | -2.33 ^a |
| | 45 days | -1.67 ^a |
| Multi-cuts (Ref level l=one cut) | Three cuts | 27.67 |
| | Five cuts | 43.33 |
| Distance (Ref level =<2 km) | 3-10 | -16.67 |
| | >10 | -11.33 |

a: Crop maturity WTP is based on non-significant coefficients, which can be ignored.

The SLHs perceive a value of 17.67 (Rs.) for improved forage varieties that ensure three additional litres over a variety that ensures one extra litre of daily milk production. The preferred improved forage varieties are multi-cuts and can re-grow within a few weeks after harvesting the first cut. Longer maturity time is considered irrelevant because of the non-significant coefficients. The highest WTP ~Rs. 43 per kg of seed is attached to multi-cut varieties that can provide five cuts throughout the crop cycle, compared to the varieties that can give only one cut. These improved

varieties may save additional labour, land preparation, and farm inputs compared to traditional fodder varieties – which require all these costs on a routine basis. Moreover, the availability of such forage varieties seeds within a *two km* radius from their livestock farms as *SLHs* attached negative utility with increasing distance.

Implications

The policy implication of our results extends beyond the geographical locations and applies to the wider *SLPSs*. The lack of prioritizing livestock production attributes and ignoring livestock smallholder's preferences while developing and marketing improved forage varieties results in lower adoption by smallholders. The government and private sector should design and develop products considering the nature of livestock enterprises and their preferred attributes.

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Do informational nudges work on fertilizer companies' legal compliance? Evidence from nationwide natural field experiments in Japan-

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Abstract

Problem and relevance

Visual inspection does not reveal the quality of fertilizer, and there is an “information asymmetry” between fertilizer producers and farmers. Under this situation, fertilizers with insufficient nutrition contents are frequently reported in developing countries and were also reported a century ago in Japan.

In the foods system, farmers are in a weak position where they are compelled to accept the prices, standards, and contract terms offered to them by companies in a food chain, with limited capacity to negotiate. Therefore, the honest and fair dealings of input industries are necessary for a sustainable food value chain.

To guarantee the quality of fertilizers, the Japanese government enacted a set of fertilizer regulations (the Fertilizer Regulation Act) in 1901, including licensing manufacture and sales, the attachment of labels containing ingredients and nutrition information, on-the-spot inspection, and a penalty system. However, substandard fertilizers are still in use today. Twenty to 30 percent of inspected fertilizers violate labeling formats, advertised nutrient content and/or tolerance limits of banned substances. Although compliance with laws and regulations has been encouraged by administrative authorities through written notification, the rate of violation has remained unchanged over the past several years. Except for profoundly serious violations, The Act is not intended to frequently impose severe penalties for violations of the law.

MAFF also requires producers of fertilizers to report annually on the number of fertilizers they produce or import, in accordance with the provisions of the Act, in order to ensure fair trade and safe application of the fertilizers and to protect their quality. Currently, producers and importers who have registered are required to report to MAFF by the end of February each year, but many companies do not submit their reports by the deadline - which has become a problem for the fertilizer administration.

Material and methods

To address this issue, we conducted an over two-year nationwide natural field experiment in Japan to demonstrate whether behavioral nudges can enhance legal compliance behavior among fertilizer companies. We set two types of outcomes: (1) “on-time submission behavior” of production quantity reports, which is a proxy indicator of the law compliance, and (2) “number of law violations” (i.e., compliance of labeling formats, advertised nutrient content, and/or tolerance limits of banned substances), which is directly measured by the on-site inspections of fertilizer producers by public authorities over a period of one year. Approximately 300 out of 2,000

companies are selected for inspection by national authorities every year by rotation based on the overall inspection history and violation experience of companies in the past.

There have been several studies using nudges for compliance enforcement, and they have already been used in actual policy fields, but most of them have been conducted on individuals. Still, there is limited evidence that these interventions are effective at changing the behavior of organizations. One of the characteristics of this natural field experiment is that the subjects are not individuals, but companies. OECD (2017) argues that not only individuals within organizations but also organizations themselves are subject to nudges. However, since the decision-making process of organizations such as companies is more complex than that of individuals, not so many empirical studies have been accumulated, and no systematic explanation for the effectiveness of nudges has been provided.

To lend empirical insights into this question, we partnered with the MAFF and sent 1,947 messages to all registered fertilizer companies. A unique feature of this field experiment is that we observe companies across the full distribution of size. This feature allows us to test at scale whether nudges can effectively raise compliance, which can assure external validity. Furthermore, it allows us to contrast the behavior of small companies to that of large companies and specify the regional difference in the effectiveness of nudge - a comparison that, to our knowledge, has heretofore remained unexplored in this context.

Results

Based on the accumulation of nudge studies on individuals, this study examined the effectiveness of nudges on compliance behavior of fertilizer companies.

A total of 1,947 companies, all nationally registered, were targeted in this experiment, 69 of which had their request form returned because they were either out of business or their address was unknown. We randomly allocated companies into one of three groups: the control group consisted of 629 companies, treatment group 1 (“loss aversion” message) consisted of 628 companies, and treatment group 2 (“social norms” message) consisted of 621 companies. Our control group was given a simple law compliance notification message. Before our partnership, this was standard practice for the MAFF. To augment this baseline, we included two types of additional messages: one increased the salience of “potential” prison and financial penalties instituted under the law (treatment group 1), while the other increased the salience of social norms by emphasizing the majority of companies comply law and serious violation is exceedingly rare (treatment group 2).

The main outcomes are as follows. Regarding the first outcome “on-time report submission behavior,” the “loss aversion” message worked significantly. A logistic regression analysis using the binary variable of “submitted” or “did not submit” the production quantity report on time revealed that the odds ratio of outcome in the intervention group was 1.37 (95% confidence interval: 1.07–1.76). We complemented our main analysis by looking at heterogeneous treatment effects. We found that the effect of nudge varied by region and companies’ size. In addition, we found that the effects of nudge are sustained for more than a year in some regions based on an after one year follow-up survey.

Concerning the second outcome - “number of violations” - which was counted as a result of on-site inspections over a one-year period after the message was sent, the number of violations was lower in the treated groups: a number of violations in the control group were found in 4/22 companies (18.2%), treatment group 1 was 3/29 companies (10.3%), and treatment group 2 was 2/27 companies (7.4%). However, the statistical test did not show significant differences for any of the outcomes due to the unusual small inspection number during the Covid-19 pandemic.

Implications

In the food chain actors, regulation compliance issue is crucial. However, the compliance of fertilizer companies (agricultural input industry), which contribute to a suitable food supply, has not been examined enough in the context of developed countries where a set of fertilizer regulations has been in operation. We add to a growing body of research that shows that seemingly minor differences in message design can have profound effects on real economic outcomes of fertilizer companies.

A common consideration with any empirical estimates pertains to generalizability. Considering the naturalness of the choice task, setting, and time frame, we used a natural field experiment partner with MAFF; thus, our setting is one in which fertilizer companies are engaged in a natural task and, therefore, have a good external validity. Now MAFF has been considering new messages based on this experiment.

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Knowledge Gaps about Micronutrient Deficiencies in Tanzania and the Effect of Information Interventions

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Abstract

Problem and relevance

Micronutrient malnutrition refers to an inadequate intake of critical vitamins or minerals. Deficient intake of iron, vitamin A, and iodine causes negative health outcomes, particularly for pregnant women and children in low-income countries (WHO 2021). In 2015, 600,000 Tanzanian children under the age of five were estimated to be acutely malnourished, and 100,000 were categorized as severely malnourished (URT 2016). Pregnant women often suffer from multiple nutritional deficiencies, further aggravating negative health consequences (Haider & Bhutta 2017). The 2016 National Multisectoral Nutrition Action Plan (NMNAP) was established in Tanzania “to address the unacceptably high levels of malnutrition” (URT 2016).

Additional to the NMAP, the biofortified guidelines established by the Ministry of Agriculture declared iron, vitamin A, and zinc significant nutrients of public health (URT 2020). HarvestPlus develops crops biofortified to target specific micronutrient deficiencies (Bouis & Saltzman 2017). HarvestPlus ‘brands’ these crops with the targeted micronutrient in the crop name (e.g., ‘zinc wheat’ instead of ‘biofortified wheat’). Iron beans, vitamin A maize, and vitamin A orange sweet potato are currently available in Tanzania; however, availability alone is insufficient to reduce malnutrition.

A key strategy defined by the 2016 NMNAP is the use of communication targeted at social and behavior change to increase the consumption of micronutrients (URT 2016). Behavior change is dependent on several factors, and frameworks have been developed to better understand the factors that enable behavior change. The CUBES framework uses distinct stages of change to examine the adoption of behavior and the drivers of change; the stages are knowledge, intention, action, repetition, and habit (Engl & Sgaier 2019; Engl, Smittenaar, & Sgaier 2019). There is a need to better understand knowledge gaps associated with micronutrient deficiencies in Tanzania.

The objective of this study was to provide evidence-based recommendations about the knowledge gaps associated with micronutrient deficiencies and biofortified foods and examine the effectiveness of targeted communication approaches. Data were collected on awareness of micronutrient deficiencies, perceived susceptibility to being deficient, and knowledge about negative health effects and fortified foods that reduce the risk of micronutrient deficiencies. These data were collected for iron, vitamin A, zinc, and iodine. Knowledge gaps about micronutrient deficiencies and biofortified foods were identified using an online survey that randomized respondents into groups across two embedded experiments (described in slightly more detail below).

Materials and methods

The survey instrument was approved by the Institutional Review Board at the University of Delaware. The groups of interest for this study were Tanzanian women ranging from ages 18 to 49 and low-income households, as these groups are at higher risk for micronutrient deficiency (WHO 2021). Females were oversampled during data collection and the online survey was completed by 1,029 respondents, 806 of whom were female. The online sample was recruited through the market research services of Qualtrics and data collection ran from May 25 to July 23, 2021. The survey was translated into Swahili by Stepes using a medical translator so respondents could choose to complete the survey in English or Swahili.

After consenting to partake in this research, respondents were asked what country they live in, their age, and sex to ensure respondents resided in Tanzania, were between the ages of 18 and 49, and so that females could be oversampled. Respondents then answered a series of question blocks for each micronutrient of interest (i.e., iron, vitamin A, zinc, and iodine). The blocks included questions asking about awareness and susceptibility to being deficient, and then respondents were asked to select the negative health outcomes associated with deficiencies and the beneficial foods that reduce the risk of deficiency.

Respondents were randomized to a group across two experiments embedded in the survey and remained in a group for all micronutrient question blocks. One experiment identified knowledge gaps and potential communication approaches by providing an information intervention after the awareness question in a block. The interventions provided information about the susceptibility and severity of micronutrient deficiencies and foods that reduce susceptibility. Also, the Tanzanian flag accompanied the information provided to some respondents within the communication groups to examine if it increased attention to the information, and thus the effectiveness of an intervention. There is evidence that audiences in Tanzania trust public service announcements, which can increase male support for women to adopt recommended practices that improve maternal and child health outcomes (BBC 2015).

The other experiment identified the ‘branding’ effect associated with including a target micronutrient in the name of a crop. Some respondents were randomized to view the names of HarvestPlus crops as response options in the question asking about risk-reducing foods. Respondents in a branded group could also receive information, and those respondents were shown the branded biofortified crops in the information intervention. The experimental groups are illustrated in Figure 1 and examples of the interventions are shown in Figure 2.

Results

There was an overall difference in awareness across the micronutrient deficiencies. More than 75% of the sample were aware of iron and vitamin A deficiencies, while only 55% were aware of zinc. Females and males had similar levels of awareness across all micronutrient deficiencies. High-poverty households were less likely to have heard of iodine deficiency by about 12 percentage points without controlling for additional demographics and 8 percentage points after controlling for additional demographics. Consumers also were generally more concerned about the susceptibility of iron and vitamin A deficiencies compared to zinc and iodine. Information had little effect on perceived susceptibility; however, respondents who received information were less

likely to select ‘I don’t know’ as the response option to the questions measuring perceived susceptibility. Knowledge gaps about the negative health outcomes associated with micronutrient deficiencies and the fortified foods that reduce the risk of susceptibility were identified for iron, vitamin A, and zinc. However, information interventions were very effective at reducing the knowledge gaps, as was the use of ‘branding’ for biofortified crops.

Implications

The knowledge gaps identified by this study provide insight that can increase the efficacy of programs like the National Multisectoral Nutrition Action Plan and National Biofortification Guidelines.

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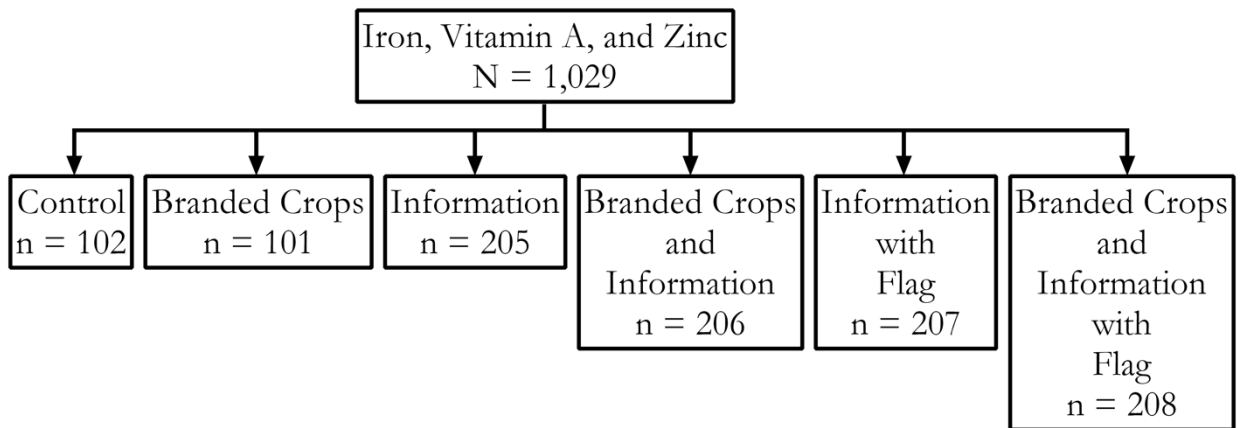


Figure 1. Communication and Branded Experimental Groups and Group Sizes

Information

IRON DEFICIENCY

Iron deficiency happen when someone does not get enough iron in their diet. About 45% of women and 60% of children are iron deficient.

What happens when you don't get enough iron?

- Reduced ability to do physical labor
- Impaired mental development and learning capacity
- Anemia

What are good sources of iron?

- Meat
- Biofortified Beans
- Biofortified Millet
- Fortified Flour

Branded Crops and Information

IRON DEFICIENCY

Iron deficiency happen when someone does not get enough iron in their diet. About 45% of women and 60% of children are iron deficient.


What happens when you don't get enough iron?

- Reduced ability to do physical labor
- Impaired mental development and learning capacity
- Anemia

What are good sources of iron?

- Meat
- Iron Beans
- Pearl Millet
- Fortified Flour

Branded Crops and Information with Flag



IRON DEFICIENCY

Iron deficiency happen when someone does not get enough iron in their diet. About 45% of women and 60% of children are iron deficient.

What happens when you don't get enough iron?

- Reduced ability to do physical labor
- Impaired mental development and learning capacity
- Anemia

What are good sources of iron?

- Meat
- Iron Beans
- Pearl Millet
- Fortified Flour

Figure 2. Example of Information Provided to the Communication Groups

Adoption intentions of smart weeding technologies – a lab-in-the field experiment with German crop farmer

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Abstract

Smart weeding technologies (SWT) could make modern agriculture more sustainable, for example, by enhancing agrobiodiversity. Our knowledge about what determines farm-level adoption is limited because few economically viable SWT systems are available. We conduct a lab-in-the-field experiment among 334 German farmers to test if a subsidy, a nudge, and a combination thereof affect adoption intentions. We further assess whether environmental attitude, innovativeness and belief in farming data privacy explain hypothetical SWT adoption. Attitudinal measures clearly modulate hypothetical adoption decisions. Policy treatments are statistically not significant but positively associated with SWT adoption intentions.

Keywords: Sustainable intensification, attitudes, subsidy, environmental nudge, fractional multinomial logistic regression

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Research design proposal for a study on effects of information on willingness to pay for safe food in Nigeria: the case of aflatoxin contamination

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Abstract

Problem and relevance

Food Borne Diseases (FBD) continue to place huge economic and health burdens on countries in Sub-Saharan Africa (SSA). FBD cost Africa USD 16.7 billion a year in terms of productivity loss with Nigeria alone bearing 15% of this cost (Jaffee, et al., 2019). Yet, trade of food with unknown safety status are pervasive in many of the domestic food markets in SSA, and domestic market for verified safe fresh food products is largely non-existent. Absence of or low demand for food safety and information asymmetry have been cited as part of the barriers to trading safe food in developing countries (Ortega & Tschirley, 2017; Hoffman et al., 2019). These are further associated with consumers' limited awareness of health risks of consuming unsafe food (Lagerkvist, et al., 2013, Ortega & Tschirley, 2017; Hoffmann, et al., 2019). Hence, providing consumers with health-risk related information can potentially make consumers willing to pay premium for safe food (Ortega & Tschirley, 2017). However, few studies (Birol, et al., 2015; Banerji, et al., 2016; Groote, et al., 2016; Hoffmann, et al., 2021; Kariuki & Hoffmann, 2022) which investigate the effect of extrinsic health risk information on consumers' wtp or demand for verified safe food products in developing countries generally suggest that significant information effect on wtp for food safety is more likely when health risk information is combined with other forms of information or incentive.

Here, we propose a research which aims at testing the effects of information relating to credibility of certification; and objective market-level and household level food safety risks on wtp premium for verified aflatoxin-free food. Aflatoxin contamination (AC) is a highly toxic carcinogenic fungal contaminant which is difficult to observe directly in food. Majority of actors along the food chain especially domestic consumers are not aware of AC (Ezekiel, et al., 2013; Udomkun, et al., 2017; Ojuri, et al., 2019; Sanou, et al., 2021). Therefore, we propose a research to answer the following research questions:

- i. What is the effect of providing information about health risks of and exposure to aflatoxin-contaminated food on consumers' willingness to pay for tested safe food; and
- ii. What is the effect of providing information about health risks of aflatoxin-contaminated food and details of certification procedure on consumers' willingness to pay for certified safe food.

Theoretical framework

Following Deacon and Shapiro, (1975); Hamilton et al., (2003); and Birol et al., (2015), we assume that the wtp of consumer i for food which has been verified to be safe for consumption by can be specified as

$$WTP_i = \Delta H_i \cdot \frac{V_r^i}{V_p^i} \quad (1)$$

where ΔH_i is the perceived reduction in food-related health risks of consuming verified safe food relative to food with unknown food safety status; V_r^i is the consumer's marginal disutility for health risk and V_p^i is the marginal utility for income. Further, V_r^i can be assumed to be scaled by consumer's risk preference such that risk-averse consumers have high V_r^i while V_r^i is low for risk-loving consumers. Let risk-preference for the consumer i be noted as R_p^i . Now Eqn (1) can be written as

$$WTP_i = \Delta H_i \cdot \frac{V_r^i / R_p^i}{V_p^i} = \Delta H_i \cdot \frac{V_r^i}{V_p^i R_p^i} \quad (1a)$$

To understand how information can impact perceived reduction in food-related health risk, assume that there are two states of food safety related health risks – low health risk state, H_g and high health risk state, H_b . Let the subjective probabilities of reduction in food safety risks attached to verified safe food and unverified food be given as π_c and π_{nc} respectively. The expected reduction in health risks of the consumer for verified safe food is given as

$$\pi_{ic}H_g + (1 - \pi_{ic})H_b \quad (2)$$

while expected reduction in health risks for food with unknown food safety status is given as

$$\pi_{inc}H_g + (1 - \pi_{inc})H_b \quad (3)$$

Change in risk reduction as perceived by the consumer from verified over unverified food equals Eqn (2) – Eqn (3) to give

$$\Delta H_i = [\pi_{ic} - \pi_{inc}][H_g - H_b] \quad (4)$$

We assume that $\Delta H_i \geq 0$ for all consumers. The wtp of consumer i can now be rewritten as

$$WTP_i = [\pi_{ic} - \pi_{inc}][H_g - H_b] \cdot \frac{V_r^i}{V_p^i R_p^i} \quad (5)$$

The term $[\pi_{ic} - \pi_{inc}]$ is the gap between the credibility that the consumer holds towards verified safe food over unverified food while $[H_g - H_b]$ is the health gap which measures the gap between what the consumer considers as low risk state and high-risk state. This framework therefore presents the opportunity to influence WTP through credibility gap, Health Gap using information. Following a Bayesian belief updating applied in Lybbert, et al., (2007), post information updating of the π_{ic} and π_{inc} conditional of information can be respectively given as:

$$\pi_{ic|t} = \pi_c^t + \delta_i(\pi_{ic} - \pi_c^t) \quad (6)$$

$$\pi_{inc|t} = \pi_{nc}^t + \delta_i(\pi_{inc} - \pi_{nc}^t) \quad (7)$$

where

- δ_i - the confidence that the consumer has in his prior beliefs;
- $\pi_{ic|t}$ - updated subjective probability of verified safe food delivering low health risk conditional on information treatment, t;
- $\pi_{inc|t}$ - updated subjective probability of unverified food delivering low health risk conditional on information treatment, t; and
- π_c^t and π_{nc}^t - signals from information treatment t that could lead to Bayesian updating of π_{ic} and π_{inc}

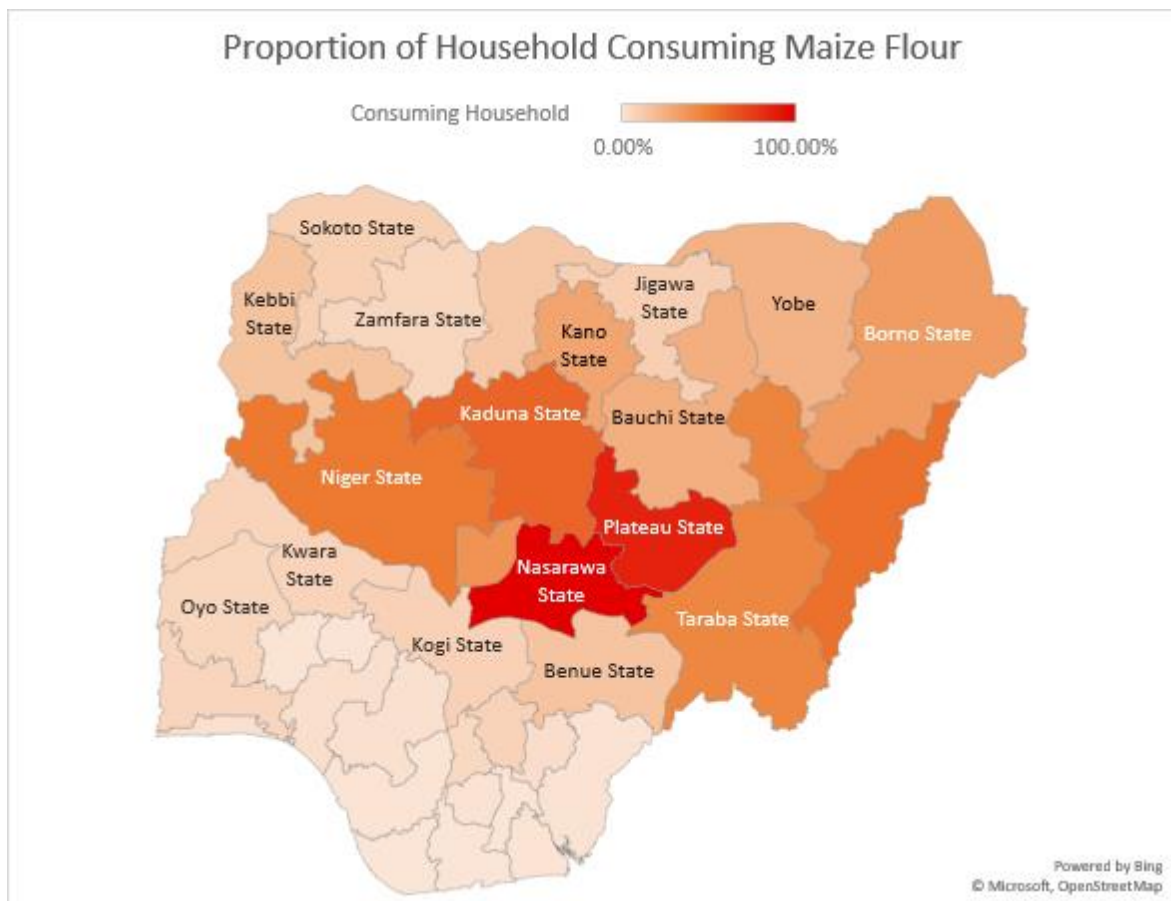
Methods

Study Area and Food Product

This study is proposed to be carried out in Nasarawa state in the northern Nigeria. Maize flour is a staple for majority of households in the state (National Bureau of Statistics (NBS), 2021). See figure 1 for proportion of households consuming maize flour by states. Although maize is generally susceptible to aflatoxin contamination, maize flour, a processed form of dried maize is a candidate food product for the purpose of this research because safety status of maize flour is completely a credence attribute.

Households in the state acquire their maize flour either by processing own-produced maize or by purchasing maize flour directly from the market (NBS, 2021). In the first phase of this research, we focus on the latter category of households for which we test wtp for tested verified safe maize flour using two experiments. For each of the experiments, a sample of 220 households will be drawn through systematic household visits to make a total of 440 households.

Figure 1: Proportion of Households Consuming Maize Flour by State



Experimental Design

As previously mentioned, two experiments will be carried out to test the effects of Health Risk Information (HI), Exposure Information (EI) and Certification Information (CI) on wtp for verified safe maize flour. The designs for the experiments are presented visually in figures 2 and 3.

Figure 2: Experimental Design for Experiment 1

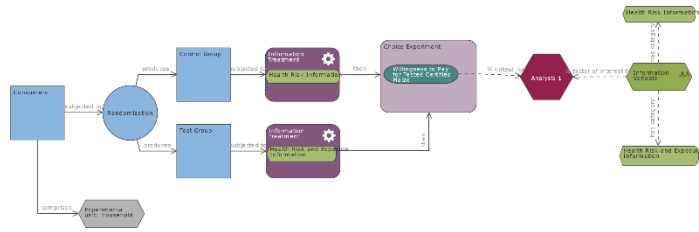
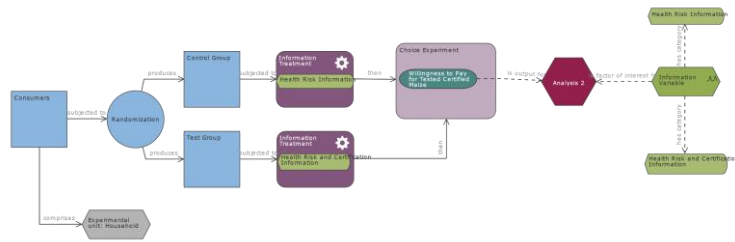


Figure 3: Experimental Design for Experiment 2



Session 2



Consumers perceptions and preferences for winery's social contributions

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Abstract

Problem and relevance

The present experiment aimed to provide wine makers with useful information and help them to develop appropriate communication strategies. It assessed consumers' preferences and willingness to pay for conventional, organic and selected vintage organic wine. It focused on the effect of taste and the provision of information relative to the production system and the winery's social activities (social inclusion) on consumers' purchase behaviors and willingness to pay for wines. There is a wide literature on wine choice (see review of Schäufele and Hamm, 2018 and Lockshin and Corsi, 2012) focused on the effect of wine environmental features, however, research on the effect of the provision of information about winery's social activities is still scarce. This experiment tested whether informing consumers about winery's social activities would affect their preferences and willingness to pay for wine.

Material and methods

We conducted a fifth-price multi-product auction (simultaneous) in June, 2019 in Barcelona (Spain). The auction was performed among 300 Catalans' red wine drinkers'. The auction had a total of six rounds of bidding and in each round subjects were required to simultaneously bid for conventional, organic and selected vintage organic red wine. In each round, subjects were presented with a bottle of a conventional red wine, a bottle of an organic red wine, and a bottle of a selected vintage organic red wine and they were asked to state their bids for each of the three wine typologies. Subjects were required to bid to buy a bottle of red wine for a special occasion. During the rounds, participants were provided with the following information: without any information (Round 1), labels of the bottles (Round 2), capsules (Round 3), production system (round 4), appellation of origin (round 5). Just after the round 5, participants were invited to taste the wines (round 6).

Right after the third round we provided half of the sample with the information on the winery social activities. This social information was provided written on a short brochure. The second half was considered as a control group (without the social information). We also changed the order of the fourth and the fifth rounds to test whether the order of providing the production system and appellation of origin would influence consumers' bids. Half of the sample received information about the production system before the appellation of origin, while the other half of the sample received information about the appellation of origin before the production system. So, we divided our sample to 4 groups.

Subjects were endowed with €20 prior to bidding to make the experiment more realistic. At the beginning of the experiment, subjects were informed that the experiment is real and at the end of the six rounds a winning round and wine will be randomly selected and the winners of the auction will be the 4 subjects with the highest bids for the wine drawn in the selected round. The winners would have to pay the fifth highest price and take the selected

wine home. They could win the wine and some money (the difference between the 20 euros received at the beginning and the fifth price).

Results

Table 1 shows the average WTP for each wine in all the six rounds. Results show that members of the treatment group who received the social information were less likely to pay for conventional and organic wine than members of the control group (Without social information). This result is similar to that we found in another experiment where we provided this information via video. However, there were no statistically significant differences in WTP for selected vintage organic wine. Moreover, the order of the provision of the information related to the production system (PS) and appellation of origin (AO) had no effect on the WTP for the three wines in the control group. However, the order of this information influenced significantly the bids of the treatment group (With social information). In particular, participants who received first the appellation of origin were more likely to pay for each of the three wines.

Table 1: Participants bids for the different wines by groups

| | Without social information | | With social information | | Kruskal Wallis test p | |
|-----------------------------|----------------------------|-----------|-------------------------|-----------|-------------------------------|-------|
| | Mean | Std. Dev. | Mean | Std. Dev. | | |
| | Sample | | | | | |
| WTP for conventional wine | 14,66 | 3,56 | 13,41 | 3,28 | 34,21 | 0.000 |
| WTP for organic wine (OW) | 14,64 | 3,38 | 14,04 | 3,08 | 7,85 | 0.000 |
| WTP for selected vintage OW | 15,09 | 3,88 | 14,82 | 3,44 | 0.08 | 0.765 |
| | Without social information | | | | | |
| | PS==>AO | | AO==>PS | | | |
| WTP for conventional wine | 14,47 | 3,38 | 14,85 | 3,74 | 0.86 | 0.352 |
| WTP for organic wine (OW) | 14,8 | 3,32 | 14,49 | 3,45 | 2.14 | 0.143 |
| WTP for selected vintage OW | 15,13 | 3,69 | 15,05 | 4,08 | 0.61 | 0.433 |
| | With social information | | | | | |
| | PS==>AO | | AO==>PS | | | |
| WTP for conventional wine | 12,54 | 2,86 | 15,08 | 3,41 | 65.93 | 0.000 |
| WTP for organic wine (OW) | 13,82 | 3,22 | 14,46 | 2,75 | 8.94 | 0,002 |
| WTP for selected vintage OW | 14,12 | 3,34 | 16,17 | 3,23 | 50.49 | 0.000 |

Implications

The results of this experiment are not in favor of communicating information about the winery's social contributions to consumers at least in the format we tested it (brochure). It seems that participants associate this social information with low quality wines. Wineries in Spain usually promote their social actions in their social networks, but they do not usually include this type of information in the wine bottles. However, there is great interest in including this information in the wine bottles.

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Preferences for meat substitute with plant-based proteins: an experiment with real products consumption

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Keywords: meat substitutes, sensory evaluation, choices experiment, real products

Abstract

Problem and relevance

People say that they are interested by meat reduction or substitution for many arguments: health, environmental and animal welfare. On this basis, firms explore new models and new supply (better meat or meat substitutes) in order to keep or to increase market shares. But what consumers really do when they face to the real product? In a study with European meat consumers, Michel et al. (2021) compares expectations about taste, healthiness, and environmental friendship of beef burger and two vegetable substitutes. These consumers expected that vegetable burgers are healthier and environmentally friendly but less tasty than beef burger.

A growing literature propose to study consumers preferences for meat substitutes that are close to meat attributes, as burgers, through choice experiments (Slade, 2018; Apostolidis and McLeay, 2019; Van Loo et al., 2020; Carlsson et al., 2022). In parallel, another growing literature includes real tasting with sensory evaluation and some monetary valuation of products and information (Bazoche et al., 2021; Martin et al., 2021; Grasso et al., 2022). The first observe that people generally prefer the natural beef burger rather than various substitutes. Information about health or environmental arguments have a positive impact on substitution. Last, alternatives are preferred by vegetarians, younger persons, and people with higher education. The results of these works are based on hypothetical choices and hypothetical products, even if some exit in the real life (beef for instance). The second show that introduction of real products provides similar issues but with more information on the effect of taste on preferences. If people prefer the meat product, they could accept hybrid ones or plant-based with argument about health and environment.

The study includes products eaten in a real consumption situation. We question whether consumers are willing to substitute their usual meat product by a plant-based proteins (PBP) made product? We introduce the PBP product in a real context of consumption and a real choice between new product and usual product. As a complement of the real choice, we introduce hypothetical questions about what could change their choice (price, nutritional information, environmental information, origin information or production methods).

Material and methods

The food product introduced in the experiment is a PBP sliced product. It is an experimental processed food product made by an industrial partner. In this experiment the product is

presented in two distinct flavors (poultry / smoked). Each participant receives only one of the two products.

We recruited consumers and buyers of sliced products for an experiment involving consumption of new products at home. They are omnivores or flexitarians (meat reducers), but not vegetarians. First, they inform the quantity of sliced products (ham, poultry slices) they consume per week. The study mobilizes methods of sensory evaluation and experimental economics.

Participants follow online instructions which guide them during the two weeks of the experiment. At the beginning of the first week, participants receive a quantity of PBP product corresponding to their declared weekly consumption. Participants are invited to consume the PBP product as they do with their usual product. During and after this meal, they answer to the following questions: description of the meal (photo), number of people, general liking and liking for appearance, smell, meal. Then, they choose what product they prefer for a second week of consumption, between this product and their usual product: “For the week 2, do you prefer to receive (at the drive) the same product (PBP) or do you prefer to receive your usual product?”. After this choice, we ask hypothetical question on what could change their choice. The second week, they receive the PBP product or their usual product (gift card to buy it). Last, we introduce some scales (Food Neophobia, Food Technology Neophobia) and socio-demographic questions.

Results

166 subjects from Dijon area participated to this study in December 2020. 55% are women and the average age is 42 years. 74.7% declare to be omnivore and 25.3% are flexitarian. We observe their consumption of the PBP product in a natural environment (real consumption at home) and choice between keep it or not for a second week.

First of all, 38% of participants keep the PBP product for the second week (rather than come back to their usual sliced product). We do not observe any significant difference between the two aromas, nor by gender. Second, a significant difference is associated to diet: flexitarians (52%) keep more the PBP product than the omnivores (33%). Third, the liking of the meal with PBP product play an important role in keeping, even if liking is higher for flexitarians. The average liking of keepers is 6.17 (on a scale from 1 to 9) and of quitters is 4.16 (significantly different). Forth, the price paid for the usual product does not have any effect on the decision. Fifth, the food technology neophobia (FTN) has a significant negative impact on keeping the PBP product. This not observed with food neophobia. Last, the traditional socio-demographic characters do not impact the decision to keep the new product.

After observing these real behaviors, we are interesting by product characteristics that could change (hypothetically) the decision of the quitters (N=103): price (lower than usual product), ingredients' origin, ingredients' methods of production, and environmental and nutritional improvement. A reduction from 10 to 40 cents changes the decision from 5% to 10% of quitters, but a reduction by 50 cents changes the decision of 25%. European origin of ingredients has the same effect than a 40 cents price reduction. French origin changes the decisions of more than 40% of quitters. This is the same (between 35% and 40%) for the other characteristics: product without GMO, product with ingredients from organic agriculture, an improvement in the environmental impact and an improvement in the nutritional score (Nutriscore). We will explore analytically the reasons of these changes.

Implications

To summarize, in this study, those who keep the PBP product for the second week are mostly flexitarian, consumers with high liking rate and people with a low food technology

neophobia. In order to be accepted by a larger scale of consumers, this kind of meat substitutes need to have additional arguments: lower price, closer origin, lower environmental or nutritional impact.

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Eliciting consumers' willingness to pay for Mediterranean type of functional food using experimental auctions

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Key words: Mediterranean type of functional food, willingness to pay, experimental auctions, BDM mechanism, Croatia

Abstract

Problem and relevance

Public and scientific interest in sustainable diets has increased in recent years. The Food and Agriculture Organization of the United Nations (FAO) Sustainable defines sustainable diets as “diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations”. Mediterranean diet (MD), a dietary pattern detected in the late 1950s and early 1960s, has been recognized as a very healthy, sustainable dietary model. Numerous scientific, multidisciplinary studies have concluded that Mediterranean dietary patterns are more consistent with recommended nutrient and micronutrient intakes and that the MD is associated with reduced mortality and lower risk of chronic metabolic diseases.

The Mediterranean diet, in its broadest sense, is a diet consumed by the inhabitants of countries in the coastal belt of Europe, Asia and Africa. It is based on a variety of local, traditional ingredients and foods associated with the Mediterranean environment, including local spices. Some of these Mediterranean spices have beneficial health effects and are therefore added to foods that are considered functional food. An example of such a Mediterranean functional food product is cheese with local medicinal and aromatic herbs.

Consumers buy functional foods because they believe they have unique or superior attributes compared to other foods. What consumers may not realize is the presence or absence of functional food characteristics even after purchase and use, because a particular production method is a credence attribute. Credence attributes can be transformed into a search attribute via labeling. The market success of functional foods therefore depends on whether consumer recognize functional attributes and are willing to pay for them, but also on whether they accept the taste of the food.

The objective of this study is to reveal Croatian consumers' WTP for functional food of Mediterranean types of (cheese with Mediterranean medicinal and aromatic herbs) and to explore how taste influences consumers' WTP for these products. Another objective of the research is to examine what affects consumers' willingness to pay for cheese with Mediterranean medicinal and aromatic herbs, and to explore influence of consumers' attitudes on their intentions regarding healthy eating.

Materials and Methods

The research will be conducted face-to-face at three places, i.e. three points of sale: supermarket, open-air market and grocery shop (typical Croatian shopping environments). Participants will be asked to participate in an experimental BDM auction with three bidding

rounds for three different types of cheese (cow's milk cheese without added aroma, cow's milk cheese with immortelle aroma and with lavender aroma).

In the first bidding round participants will be presented with 3 cheeses for visual inspection only. No information will be given about the cheeses. Participants will have to place their bids for three cheeses offered, based only on their visual assessment of the cheeses. In the second round, participants will receive information on which of the Mediterranean aromatic and medical herb functional ingredient are added in the cheeses and will be again asked to place their bids for all three cheeses. In the final round, participants will first taste all three offered cheeses and then place their bids for each tasted cheese. To reduce the bias of the aroma in the mouth after tasting the cheeses, the participants will be divided into two groups that will differ in the order of cheeses to be tasted. The cow cheese without added aroma will be tested as the second cheese in both experimental groups, while the order of the cheeses with added aroma alternates will change between groups.

In addition to the bidding rounds, participants will be asked to complete a questionnaire that includes questions about their eating behaviour, their knowledge and attitudes towards healthy diets with a special focus on MD, their intention to change their eating behavior as well as their socio-demographics.

Several statistical methods are planned to use to evaluate the significance of the data collected, such as Correlations, Frequencies, the Hausman test, Paired Samples t-test (comparison of means of dependent samples), and the F-test. Descriptive and exploratory analysis of participants' WTP will be performed. Correlations and multiple regression analyses will be conducted to test the fit of the model to the research hypothesis.

Results

The incentive compatible BDM mechanism in three typical Croatian shopping environments will allow to reveal the true WTP for cheeses with added aroma. The second round will allow to elicit consumers' WTP for particular Mediterranean aromatic and medical herb added to cheeses. The final bidding round will allow to explore influence of tasting on consumers' WTP. Another expected outcome of this survey is to determine the influence of attitudes on healthy diet on consumers' WTP for functional foods.

Implications

The results of the collected research should foster new ways of measuring WTP for functional foods, using experimental auctions. Insights into consumers' WTP for functional food, gained through an experiment using the example of cheese with the addition of medicinal and aromatic herbs, would have practical implications and could significantly help not only growers of medicinal and aromatic herbs, but also cheese producers, both in the development of new products - the production of cheese with the addition of medicinal and aromatic herbs and in creating effective marketing and sales strategies. The results of this research will have an impact on the promotion of the Mediterranean type of functional food.

Between innovation, sustainability and convenience, which affect mostly the choices for seafood? A survey with participants from Croatia

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Abstract

Problem and relevance

As happens for many foods and other tradable goods, the specific demand for fish may change

in a very short time, reflecting changes in society that usually affect social, environmental, political or economic aspects.

According to Euromonitor International [1], the main driver of the recent reduction of fish consumption in western Europe has to be traced in the modern lack of cooking skills. Moreover, other barriers are identified in the high price of fresh seafood and the limited availability of quality fresh aquaculture products in some distribution channels, especially if located in the deep inland.

At the same time, Euromonitor [2] identifies three distinct trends that are already driving consumption, and are particularly attractive to Millennials and younger generations:

1) Convenience and practicality: the modern lifestyle requires a full familiar employment. Thus, on average, families have less time to shop and prepare the food.

2) Health and well-being: The growing interest in good practises for well-being, especially in terms of eating habits and proper diets, could boost demand. In fact, the FAO considers fish as an irreplaceable key element of a healthy diet due to the high value proteins and Omega-3 fatty acids (FAO, 2020).

3) Sustainability: the fishery sector present endemic problems of sustainability. In the search for an equilibrium between business profitability and safeguard of the wild fish stock, a new approach could help finding a balance. New generations and consumers in general seem to be more focused on the environmental impact of their actions on the environment, as reflected in the conscious consumption movement.

Hence, the present study aims to understand how these elements affect consumer preferences for an innovative fish burger in the Croatian market. Croatia is a particularly relevant market, especially for its geographical position, between Mediterranean and Eastern Europe countries and, thus, studying this market might give significant hints for understanding changes occurring in both geographical regions.

Material & methods

Data was collected in June-July 2021 online through Qualtrics. Participants were recruited in collaboration with a market research company. The sample is representative of Croatian population in terms of gender, age, education, and geographical location.

The questionnaire was organized in 7 parts. At first selection questions for fish products' consumption and purchase as well as responsibility for food purchase were included.

Subsequently socio-demographic questions were presented in order to profile participants and to estimate the representativeness of the sample.

The third part of the questionnaire was dedicated to the choice experiment task. Prior to this, participants were explained the attributes and the levels of each attribute.

The following table shows the attributes and levels of the attributes:

| Attribute | Levels | | |
|---------------|------------------|----------|----------|
| Price | 21.5 CKN | 31.5 CKN | 41.5 CKN |
| Origin | Croatia | Italy | Spain |
| Certification | No certification | MSC | RFM |

The optimal orthogonal design used, generated 18 choice tasks which were divided in two blocks and each participant was presented with 9 choice scenarios where each of the scenario had 4 alternatives, three alternatives with the combination of levels and one no buy option. They had to choose only one of the alternatives.

Finally, we applied three calibrated scales, convenience, green consumer value and innovativeness. The scales were used to profile consumer and to explore how this might affect their purchasing choices.

The data were analysed using R software. Descriptive analysis was conducted to understand the data. Missing values and responses that were given too quickly were excluded from the analysis. Multinomial logit model was applied to understand consumers' preferences for fish burgers.

Results

A total of 419 people participated in the survey, of which 70 % coming from the inland and 26% from the coast. Regarding other sociodemographic variables, the majority of participants are females, between 36 and 55 years old, with a high school degree, and with average incomes.

For what concerns their purchasing habits, it seems that the majority consumes at least once per week fresh seafood products purchased mostly from supermarkets (> 50%) and 33% of them directly from fish markets

Results show that coefficients are negative for the innovative product with higher shelf life, meaning that consumers do not prefer to buy it (the coefficient is very high and highly significant). However, the no buy option is significant and with negative coefficient, meaning that consumers are open to new options. In addition, the coefficients of origin for Croatia are positive and for the other countries are negative. This means that Croatian consumers prefer to buy products from their country. Regarding certification, as it is observed, Croatian consumers, do not particularly rely on them when buying fish burgers as all coefficients are not significant.

Regarding the interaction effects with the scales, as it is observed, coefficients are not significant meaning that there is not effect on Croatians' preferences. However, price has a negative coefficient for the convenience scale and positive for the rest of the scales, meaning that the more consumers are concerned about the environmental impacts and innovation their

choices are less dependent from the scale. Nevertheless, the change, since coefficients are small, is not very high. The rest of interactions is not significant.

Table 4 Multi Nominal Logit model

| | Only burger attributes | Convenience scale ¹ | Green Consumer Scale ² | Consumer Innovativeness Scale ³ |
|-------------------------------------|------------------------|--------------------------------|-----------------------------------|--|
| Alt 2/Frozen | NS | NS | NS | NS |
| Alt 3/Innovative | -0.42*** | -0.43*** | -0.43*** | -0.44*** |
| Alt 4/no buy | -0.74*** | -0.74*** | -0.77*** | -0.80*** |
| Price | -0.03*** | -0.03*** | -0.03*** | -0.03*** |
| Origin Croatia ^a | 0.87*** | 0.87** | 0.86*** | 0.87*** |
| Origin Italy | -0.40*** | -0.40*** | -0.40*** | -0.40*** |
| Origin Spain | -0.47*** | -0.47*** | -0.46*** | -0.47*** |
| No certificate ^a | NS | NS | NS | NS |
| RFM certificate | NS | NS | NS | NS |
| MSC certificate | NS | NS | NS | NS |
| Price*Convenience | -- | -0.004** | -- | -- |
| Price*Green Consumer Value | -- | -- | 0.01*** | -- |
| Price*Consumer Innovativeness Scale | -- | -- | -- | 0.01*** |

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

1 Not significant coefficients for the rest of interactions

2 Not significant coefficients for the rest of interactions

3 Not significant coefficients for the rest of interactions

Implications

As results of this study show, Croatians consumers do not particularly rely on certification when deciding about fish burgers. Moreover, they are not interested in increased shelf life of fish burger. Considering our hypothesis that convenience, green value and innovativeness might affect preferences for seafood products, we saw that this can't be verified for fish burgers in the Croatian market. These outcomes are especially important for companies operating in the market of seafood products. However, it is necessary to understand if same results apply to other seafood products.

Acknowledgement

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Preferences for characteristics of plant-based meat alternatives: A discrete choice experiment on tofu in Sweden

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Abstract

Problem and relevance

There is an ongoing discussion on the negative environmental and public health impacts of high meat and other animal-based protein consumption in Western diets. Substituting some animal proteins with plant-based proteins is a promising route towards more sustainable and healthy diets. There is a quickly growing literature on consumers' preferences and willingness to pay for plant-based protein alternatives, but the geographical scope, the number of investigated products, as well as the understanding of the drivers of preferences for plant-based protein are still limited. To facilitate the uptake of plant-based meat alternatives, policymakers, producers, and retailers need more information about consumer preferences for specific characteristics of such products. Also, promoting the knowledge of consumers on health and environmental effects of meat consumption can increase the purchases of meat alternatives.

Material and methods

We use a pre-registered choice experiment to elicit preferences for a 400g piece of tofu as an example for a plant-based meat alternative. In an online questionnaire, respondents choose repeatedly between two different products (and an opt-out option) which differed in a) country of origin of the soybeans (Sweden, another EU country, or a non-EU country), b) country of manufacturing of the tofu (Sweden, another EU country, or a non-EU country), c) the cultivation method (organic or conventional), and d) the price in Swedish crowns (SEK, one Swedish crown is approximately equivalent to 0.10 Euro).

To explore effects of information provision, we use a split sample approach with four different treatments. In the first two treatments, we provide additional information on environmental and health effects of meat products compared to tofu, respectively. The third treatment displays a tofu recipe, and the fourth version has no additional information and serves us as a control condition. Besides the choice experiment, the questionnaire included questions on socio-demographics, and attitudes and perceptions related to climate change and food consumption. The survey was carried out by a market research company, using respondents from a representative panel of Swedish consumers. The survey took place in March 2021, and responses from a total of 1459 consumers were collected.

Results

First, we regress the number of opt-out (no purchase) choices on the information treatments and socio-demographic variables. The model indicates no statistically significant impact of the treatments on the number of opt-out choices. With respect to socio-demographic variables, we find that older respondents are less likely to opt-out. Respondents who state that they eat meat regularly are more likely to opt-out, whereas respondents with a university degree are less likely to opt-out.

Second, we estimate random parameter models with interaction terms for the treatments. This gives us the impact of the treatments on willingness to pay for single tofu characteristics. Again, we do not observe any statistically significant or large treatment effects for the different information treatments.

For an analysis of preference heterogeneity with respect to tofu characteristics, we estimate a latent class logit model with five distinct preference classes. All attributes except cost are dummy coded. Class membership is modeled stochastically using a multinomial logit model with socio-demographics as explanatory variables. The five classes are distinguished by their preferences and have class shares between 10% and 35%. Class 1 has a share of 12% and is characterized by a mean willingness to pay for a base version of tofu (conventional, soybeans from outside EU, and manufactured from outside EU) of approximately 52 SEK. No attribute coefficient is statistically significant, indicating a lack of preferences for additional quality. Class 2 has a share of 20% and is characterized by low willingness to pay values. There is no large willingness to pay for a base version. Soybeans and manufacturing in Sweden lead to an additional willingness to pay of approximately 50 SEK in this class. In contrast to Class 1, tofu is only purchased if it has at least one of these characteristics. Class 3 has a share of about 24%. It is characterized by a willingness to pay of approximately 35 SEK for a base version of the tofu. If it is manufactured in Sweden, willingness to pay increases by another 21 SEK, if the soybeans are cultivated in Sweden, it increases by 16 SEK, and if it is an organic product, it increases by 56 SEK. A local organic tofu would add up to a willingness to pay of approximately 130 SEK. Class 4 is the smallest class with a share of 9.4%. This class has no statistically significant coefficients, and we interpret it as the class comprising of respondents who have no willingness to pay or who made random choices. Finally, Class 5 has the largest share with approximately 35%. This class is characterized by a very high willingness to pay. For the base tofu, willingness to pay is already 121 SEK. For an organic product, another 24 SEK are added. Most strikingly, there is a willingness to pay of around 70 SEK and 64 SEK for tofu manufactured in Sweden and soybeans cultivated in Sweden, respectively. For the best available product, members in this class would be willing to pay approximately 280 SEK on average. These high willingness to pay values may be overestimated due to price non-attendance. We do not find statistically significant impacts of socio-economic covariates on class membership with the notable difference of respondents who regularly eat meat having a lower probability to be in Class 3.

Implications

The results indicate that a simple provision of environmental or health information has no effect on the decision to buy tofu with one possible implication being that simple appeals and marketing campaigns on health and environmental effects may have limited impacts on consumption. Further, preferences significantly differ between segments of respondents. More than half of the respondents would pay additionally for local and organic products, indicating a strong trend towards local and organic production.

Session 3



Subjective barriers and determinants to crop insurance adoption

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Abstract

Crop insurance has a low rate of diffusion among French farmers. In this context, the objective of the article is to identify determinants and barriers to crop insurance from the point of view of the farmers. We designed an original survey using different methodologies (questions, experimental test, self-ranking, likert scale, etc.). We realized a probit regression on crop insurance adoption. We show that the characteristics of the farm (e.g., diversification) and the farmers (e.g., income level) as well as behavioral variables (e.g., time preferences) have an impact on the adoption of crop insurance. In addition, we show that the characteristics of the contract have an important role in the decision to subscribe or not since the farmers who are not insured rank the premium and deductible level as main barriers, whereas the farmers who adopt crop insurance report recent loss and expect poor weather conditions for the incoming season. We discuss the results as regards to the current crop insurance reform in France.

Keywords: Crop insurance, Farmers, Determinants, Barriers, Survey, France

JEL Classification: Q12: Micro Analysis of Farm Firms, Farm Households, and Farm Input Markets; G22: Insurance, Insurance Companies, Actuarial Studies

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Crop index insurance, welfare and climate resilience: Findings from lab-in-the-field experiments in Uzbekistan

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Abstract

Problem and relevance

Weather shocks pose production risks and call for adequate climate adaptation strategies. Prominent examples for agricultural inputs are irrigation (Lybbert & Sumner, 2012) and drought-resilient seeds (Karaba et al., 2007). In the field of microfinance they constitute savings, credit and insurance (e.g., Hill et al., 2019). However, access to these climate adaptations is usually limited in developing countries due to missing markets and/or capital constraints. Evidence shows devastating effects of uninsured risks to vulnerable farmers: First, to smooth agricultural income, farmers may decide for farming practices inducing stable but lower crop productivity (e.g., Morduch, 1995). Second, lower income level evoke a tradeoff between consumption spending and short-term asset endowment. Declines in economic growth and wellbeing can be long-term impacts of uninsured weather shocks (Janzen & Carter, 2019).

Index-based agricultural insurance is an often discussed instrument to provide remedy here (e.g., Hellmuth et al., 2009). Growing evidence from the developing world indicates that index insurance improves an efficient resource allocation. Moreover, insurance payouts can prevent farmers from heavy income losses after an insured weather shock (de Nicola, 2015; Janzen & Carter, 2019; Hill et al., 2019). As stated by Noritomo & Takahashi (2020), most related studies do not differentiate between ex-ante (*sole insurance coverage*) and ex-post (*payout*) impacts, which, however, is essential to identify the true impact channel. To our knowledge, the only exception is Noritomo & Takahashi (2020), who explore the impact of index-based livestock insurance in Kenya.

Therefore, our study examines the ex-ante and ex-post efficacy of crop index insurance in Uzbekistan. It enriches the index insurance impact literature by (1) an experimental lab design that replicates the local farm environment to reveal *true* preferences prior to product implementation. (2) We focus on welfare-enhancing characteristics and financial climate resilience. (3) We analyse the impact on two weather shocks: a mild and severe drought.

Material and methods

The basis of our analysis is a series of comprehensive and approximately realistic lab-in-the-field/framed field experiments that we conducted with 199 Uzbek farmers in 2019. Data were collected at two points in time: (1) In March 2019, local partners interviewed all 696 rainfed wheat producers in Jizzakh, the local index insurance pilot region. These farmers describe our population. (2) One month later, we conducted the experiment in the building of the local agricultural administration. Prior to each experiment session, the agricultural administration randomly invited rainfed farmers from the population for participation. As no preselection was done within the sampling frame, all farmers had the same invitation probability. To avoid bias due to participation self-selection, we cooperated with the local agricultural office, whose invites are considered binding by local farmers, and farmers were

offered one alternative appointment when they were tied up with urgent matters. The overall rejection rate among the 234 sampled farmers was 15%.

The local index insurance option for drought events in grain production is currently under implementation, and identifying potential impact can prepare and improve synergies. Our experiment mimics five subsequent farming seasons in which sampled farmers decide for farm and household investments under local conditions. In this setting we introduce innovative marketable index insurance that allows us to observe revealed preferences and explore impact. To overcome endogeneity problems resulting from self-selection of index insurance adoption, we use exogenous peer insurance coverage as a valid instrument and apply the instrumental variable approach. Our outcome variables of interest are fertilizer input, household consumption, credit uptake and farm net income.

Results

Our regression results indicate that insured farmers have a higher probability to invest in fertilizer ex-ante ($p=0.012$), thus before knowing the seasons' weather conditions and potential insurance payments. The rationale for this behaviour may be that climate-related losses receive compensation. Hence, fertilizer investment may appear less risky. After suffering drought, farmers use their insurance payments to purchase fertilizer ($p<0.001$), whereas comparison farmers lack the financial resources. Probably due to the compensation rationale, consumption expenditures are ex-ante higher among insured farmers ($p<0.001$), and payouts induce higher consumption spending after a climate shock ($p\leq 0.012$). The role of credit is essential here. The probability to take up a loan tremendously decreases with received insurance payments the previous season ($p=0.001$). This signals financial independence and climate resilience. Similar can be observed in the positive impact on total farm net income post severe drought ($p<0.022$), which persists for two years with increasing marginal returns ($p<0.001$). Yet, the positive effects on consumption also remains for two lags but with diminishing returns ($p=0.009$). Additionally, we find that estimated impacts are higher in magnitude after the severe drought. In summary, crop index insurance coverage can boost on-farm welfare and climate resilience. Embedding this narrative into promotion activities may then motivate index insurance adoption and induce positive synergies on rural welfare.

Implications

Our findings corroborate the efficacy of index insurance in the developing world, if respective challenges (long payout times and basis risk) are minimized. Revealed preferences of sample farmers as the real target group allow to give index insurance a positive connotation. Future research should shed light on the external validity of these results. Finally, we are aware of the limitations of experimental data conclusions, but believe lab-in-the-field/framed field experiments to be a powerful tool to learn about farmers' revealed preferences and its consequences before market/policy implementation.

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Visual formats in risk preference elicitation: What catches the eye?

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Abstract

We explore the effect of different presentation formats on elicitation of risk preferences using a popular probability-varying task (Holt and Laury, 2002) and a payoff-varying task (Drichoutis and Lusk, 2016). The presentation formats use horizontal bars that vary either the width or height of the bars (or both at the same time) to potentially help subjects in judging how large or small probabilities and monetary amounts are in a given choice task. These graphical formats are compared to a text only format. We complement our data collection with eye-tracking data that enriches our structural models with additional information regarding how visual attention and engagement vary with the presented information. While we find no statistically significant effects of presentation formats on elicited parameters for risk preferences, we find that eye-tracking information not only is associated with preference parameters, but it also changes the inferences with respect to which decision theory better fits our data.

Examining demographic and unobserved heterogeneity in farmers' intentions to reduce pesticide use

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Abstract

Problem and relevance

The whole agri-food chain in the European Union (EU) ensures food security for over 400 million citizens and is a major economic sector (European Council, 2022). At the same time, food production can have negative impacts on the environment or society, such as its effects on biodiversity or public health.

Reducing pesticide use is essential for adjusting Dutch and European food systems to society's desires for its future production. The 'Farm to Fork' strategy describes food production as a vital service for all Europeans but also as a source of income. One of the strategy's objectives, therefore, is to halve the use of pesticides in 2030 as compared to 2020 (European Commission, 2020). Reduced synthetic pesticide use is expected to benefit biodiversity on and off farms and contribute to reduced dependency on fossil fuel input use.

Government and policy officers in the Netherlands do not prescribe how farmers should manage their crops to ensure plant health and reliable yields. Our previous research on the willingness to reduce pesticide use for environmental impacts has shown that Dutch farmers are in search of successful examples to do so, but perceive limited ability to act. They recognise the importance of reducing pesticides, but also indicate the risks (Bakker et al., 2021).

In the analyses conducted by Bakker et al. (2021), the heterogeneity in behavioural factors explaining the willingness to reduce pesticide use was not considered. In this research, we extend their analyses by examining demographic and unobserved heterogeneity. If there are patterns in heterogeneity, this means that a 'one size fits all' approach to support farmers in lowering their pesticide use is of limited use, and tailored approaches for stimulating particular farmer groups may be more effective.

Material and methods

We use the theory of planned behaviour (TPB) to identify, measure and test the relationships among a set of constructs for explaining and predicting behaviour (Fishbein and Ajzen, 2010). In the TPB framework, the intention is a function of attitude towards the behaviour and subjective norm. Many behaviours are not under complete volitional (self) control. Hence, next to these motivational constructs, there is an ability construct, named perceived behavioural control (PBC). The latter serves as a proxy for measuring how much control a person has over the performance of a given behaviour.

The three TPB explanatory constructs of intention are belief-based. As a good research practice (Sok et al., 2021), readily accessible behavioural, normative and control beliefs were elicited first from the study population. The measurement of these beliefs formed a key part of the questionnaire and was based on expectancy-value formulations. The resulting variables are so-called indirect measures of the TPB constructs and were treated as formative indicators in our statistical models. The TPB constructs were additionally measured using

so-called direct measures. These direct measures were treated as reflective indicators. From the initial sample of 681 arable farmers, we selected respondents who indicated that they only operate an arable farm. After removing ‘straightlining’ responses, the final sample size was 359.

We analysed heterogeneity in arable farmers’ intentions to reduce pesticide use in an observed and in an unobserved way. Drawing on the work of Burton (2014), we examined demographic heterogeneity. The age of the farmer, for example, can influence environmental behaviours through various causal links, including the cohort effect, life cycle stage or increased experience. Moderated regression (MMR) estimates were contrasted with estimates from structural equation models (SEM) and multiple regression (MR). Unobserved heterogeneity was examined using quantile regression (QR) models.

Results

We first addressed the question: ‘What is the relative impact of the TPB constructs on intention?’ (RQ1). SEM and MR results showed that, at the mean level of intention, social pressures from descriptive norms and PBC are the main drivers of the intention to reduce pesticide use. QR results further indicated that these effects are mostly constant across quantiles.

For the two other motivational constructs, however, QR results revealed an important additional insight. The effects of instrumental attitude and injunctive norms were not constant across quantiles. At the 25th quantile of intention, the behaviour of farmers is relatively more driven by normative than attitudinal considerations. At the 75th quantile, this is exactly the opposite. The MMR results showed that attitudinal and normative considerations have different weights among farmer generations. The motivation to act has different drivers across younger and older and across lower and higher educated farmers.

We further addressed the question: ‘Which beliefs are influential in explaining their underlying TPB construct?’ (RQ2). We found especially heterogeneity in injunctive normative beliefs. The crop advisor, for example, is an important social referent for lower-educated farmers, while colleagues from conventional farms are important referents for younger and/or higher-educated farmers.

The results also suggested differences in the way farmers perceive social pressures from their peer farmers. For younger and/or higher educated farmers, colleagues from conventional farms act as an injunctive norm and those from organic farms as a descriptive norm. For older and/or lower educated farmers, this tends to be the opposite. Injunctive norms refer to perceptions of what ought to be, what is acceptable or not. Descriptive norms refer to perceptions of what is, how other farmers behave.

Implications

We find that both observed and unobserved heterogeneity is present in behavioural factors explaining the willingness of farmers to reduce their pesticide use. The relative impact of attitude towards the behaviour and subjective norm on intention is different across quantiles, age groups and education levels. It is important to account for this heterogeneity in voluntary pesticide reduction strategies. It indicates a need for tailoring these strategies to the differences in farmers’ motivations and normative beliefs to reduce pesticide use. For the most motivated group, dialogues between organic and the more conventional farmers need facilitation. Age and education in our models served as indicators for different farm-specific socio-demographic mechanisms that affect environmental behaviour. Mechanisms, such as cohort effects and the farm life cycle stage, should receive more attention in future research on farmer behaviour.

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How Well Can Experts Predict Farmers' Risk Preferences?

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Abstract

Risk is ubiquitous in agriculture and a core interest among agricultural economists. While farmers' risk preferences are well studied, there is limited knowledge on the perspectives of stakeholders on farmers' risk preferences. We address this gap by eliciting predictions from 561 experts, which allows us to understand how well these experts understand farmers' risk preferences. First, we compare the accuracy of predictions by distinguishing different groups of experts. Second, we investigate whether the risk preferences of farmers from different production systems differ in terms of predictability for the experts. Third, we examine the effectiveness of expert predictions by randomly assigning experts to different incentives schemes. We find that an international group of researchers in experimental economics provide the most accurate predictions if compared to farm advisors and other experts from different countries as well as students of agriculture. Differences in predictions across the eight samples of farmers from different production systems are small. Incentivizing predictions by either a tournament scheme (the best prediction receives a reward) or high accuracy (randomly selected participants are paid depending on the quality of their prediction) do not strongly affect accuracy, but tournament schemes show somewhat smaller standard deviations.

Keywords: Risk attitudes; Expert predictions; Multiple prices lists; Meta-science; Experimental economics

Session 4



Experiential marketing and wine tourism: a promotional auction in the Folicello winery

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Keywords: rural tourism, event, experience, wine-tasting, product promotion

Abstract

Problems and Relevance

This study focuses on wine tourism, a rural tourism sector based on the attraction of wine in a specific territory, and it is focused mainly on the marketing and promotional aspects. We refer to the experiential marketing approach (Pencarelli, Forlani, & Dini, 2015; Pine II & Gilmore, 1998) that aims to offer an experience of the brand to the consumer. Events, such as on-winery experience, are tools to involve the consumer and to get him to immerse in a context through activities and games. So, the ultimate meaning of experiential marketing is to reach both the rational and emotional spheres. The consumer becomes a "consum-actor", an active player in the market and the reference point of a marketing strategy (Pencarelli & Forlani, 2018; Pencarelli et al., 2015; Williams, 2006). Specifically, the joint use of tasting and gaming in an on-winery experience has proven effective in achieving a competitive advantage (Santini, Cavicchi, & Canavari, 2011).

The study aims to verify a practical implication of this new paradigm in enhancing local food and wine offers. We aim to experiment with the promotional auction method, intended as an interactive game and a useful source of information on value perception. This study is innovative because it considers a modern marketing paradigm and applies it in a traditional and small family-led farm in Italy, Folicello Winery.

Material and methods

The empirical work focuses on an event held in the Folicello winery near Castelfranco Emilia (Modena province). Folicello is a 10-hectares family-run farm that produces organic beverages and sells them following traditional marketing concepts.

This event was staged on the 8th of June 2018 and called "*Il Foli in gioco*". The event included activities that are typical of winery visits. The wine-tasting took place in the vineyards of the Folicello farm. The tasting object was *Foli*, a sparkling Pignoletto PDO wine produced without adding sulfites, which was awarded a prize at Vinitaly 2018. Two guided tours across the farm were organized at two different moments of the event, giving the possibility for interested participants to get in touch with the history and characteristics of this farm and wine company.

Beyond these rather usual activities, the innovative component of the event was the possibility of participating in a "promotional auction" associated with the tasting. This is an auction implemented as a sort of game where the participants, divided into groups of 8-10 people, taste a glass of wine and express their bids for the whole wine bottle. The procedure borrows from experimental auctions, typically used to elicit willingness to pay (WTP) in market research. Four single-round third-price auctions were held, and the two participants who placed the highest bid within each auction obtained a bottle of *Foli*, paying the price equal to the third-highest bid of their auction, which is less than their bids. The auctions

allowed collecting data on participants' WTP to measure the experience's value perception. We assumed that each consumer would buy only one bottle of wine.

Finally, a survey submitted to all participants aimed to probe their enjoyment of "Il Foli in gioco" and get in touch with consumers' wants. The survey was composed of two blocks of questions: a first section only for bidders in the auctions, and a second one for all the visitors.

Results

The demand curve shows that 27 out of 35 bidders are willing to buy the bottle for more than € 5.47, which is the Foli price at the winery. This result reveals that the value attached by the bidders to Foli has been mostly higher than its actual price. The reasons have been partially expressed in the survey: first of all, the absence of wine sulfites and the recent award obtained by Foli at Vinitaly.

The maximum revenue curve for Folicello winery shows that its maximum point coincides with a price per bottle of € 5.70, close to the current Foli's price (€ 5.47). So, although many participants would be willing to pay more for a bottle of Foli wine, the current pricing policy allows to obtain the best monetary results.

In the survey data, we found a positive correlation between the participant's age and the overall level of approval of the event ($r = 0.21$). All participants generally appreciated the event (average evaluation of 8.28 on a semantic scale going from 0 to 10), and people over 30 expressed the highest ratings.

Using multiple linear regression, we verified the influence of three variables on the day's overall rating: the auction's effectiveness, the joviality of the ambience, and the guided tour's pleasantness. The outcome confirmed that these variables are good predictors of the overall rating.

The interview with the owner of Folicello farm offered us the winery staff's point of view regarding the event.

Implications

The emerged outcomes show that the promotional auction method applied to a small business is an interesting solution to test experiential marketing theories. The participants appreciated the "Il Foli in gioco" event, and this experience-based marketing measure allowed consumers to achieve a more prominent position in the value chain, making them gain the "consum-actor" status.

The results obtained validate the effectiveness of the promotional auction in a marketing context. It ultimately has had several facets of valence. First, it is a marketing tool aimed at investigating the WTP and the perceived quality of a product. Secondly, the auction has been an experiential marketing tool because it has been designed to entertain the customer, to let him experience emotions and sensations that he will remember over time. Finally, the auction has become a wine promotion tool, as the tasting has stimulated the consumer's interest and their will to discover the production processes and other details about Foli.

Finally, "Il Foli in gioco" has led to the creation of a protocol for promotional auction, which has a dual purpose: it serves as a guide for a sale activity and as a collector of information about consumer wishes. Furthermore, this protocol becomes the guideline for future research to widen the sample number.

It is necessary to recognize that the results drawn from this event are affected by a limitation related to the sample of people considered. It has not been possible to verify the validity of

some of the advanced hypotheses. This factor is valid both for the auction's and survey's data analysis.

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Familiarity and the Endowment Effect

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Abstract

Introduction

Knetsch (1989) demonstrated the existence of asymmetries in exchange behavior between two goods. Precisely, he observed that when subjects were endowed with a certain good, they were generally reluctant in giving up the received good for another one. Henceforth, the literature has claimed that observed exchange asymmetries may reflect the presence of the “endowment effect”.

However, more recent studies have questioned the presence of exchange asymmetry due to loss aversion/endowment effect and conducted different experiments to individuate factors influencing individuals’ exchange rate between two goods (Plott & Zeiler, 2007). These factors have been mainly associated with experimental procedures (Brown et al., 2015).

In this work, we focus on the role of choice uncertainty in exchange asymmetry. To this regard, previous literature has investigated how experience/inexperience with market procedures could affect trading choices, showing that a higher level of uncertainty in trading procedures led to a lower rate of trading, hence a higher endowment to the received good (Engelmann, Hollard, 2010; List, 2011). However, the recent work of Mcgranaghan and Otto (2022) showed that in a trading setting, individuals may have several different types of uncertainties and, among these, product or object uncertainty should be taken into account. Unfamiliarity with a product or with its characteristics can be a source of uncertainty in decision making processes (Walasek, Wright, & Rakow, 2014). Hence, we aim at further exploring the role of object uncertainty in exchange asymmetry by exogenously manipulating the degree of individuals’ familiarity with the products in question.

Specifically, we posit that the use of unfamiliar goods can significantly reduce individuals’ probability of having well-structured preferences towards the goods in question and can, accordingly, reduce individuals’ probability of being confident in their trading decisions. Therefore, our conjecture is that in similar market conditions, exchange asymmetry is observed when individuals are asked to make a decision between two unfamiliar goods rather than between two familiar goods. Results from this study would also allow us to define market conditions, which may influence individuals’ behavior in the food systems. To illustrate, consumers tend to face frequent decision situations under uncertainty conditions when they have to make important choices between food products and/or environmental goods. Our findings can help us to understand consumers’ choice behavior when confronted by, among others, product exchange/tradeoffs, status quo, and loss aversion effects. This is important since consumer choices can have significant implications for food, health, and environmental policy.

Materials and Methods

In order to test our hypothesis, we conducted a laboratory experiment, using a sample of 348 individuals (students and staff) from a University Campus in the USA.

A 2x4 between subjects experimental design was implemented. Specifically, we used two categories of goods which differed in terms of degree of familiarity. We selected: (1) one pair of Familiar Goods (FG), which are generally common among university students, i.e. notebooks and mugs; and (2) a pair of Unfamiliar Goods (UG), i.e. a chalk line and a type of paint brush, which have been defined as unfamiliar goods since they are not common in the stores of the area.

Following the existing literature, we used experimental procedures which were designed to reduce the generation of the endowment effect (Brown et al., 2015). Moreover, we manipulated the market conditions where we attempted to induce different levels of uncertainty in the trading (keep or trade) decision process. We specifically focused on two aspects: i) the time of physical possession of the received good that allowed us to increase the attachment to the good; and ii) the degree of reversibility of the transaction that allowed us to decrease the cost of commitment in making a decision in uncertainty conditions and therefore the generation of the endowment effect.

For each product category we, then, designed four experimental treatments:

1. Control Treatment (CT): during the trading decision, participants were not informed about which good they were endowed with;
2. Information Treatment (IT): during the trading decision participants were informed about which good they were endowed with;
3. Delayed Decision Treatment (DDT): participants were informed about which good they were endowed with and they could delay their trading decision the day after;
4. Reversible Decision Treatment (RDT): during the trading decision participants were informed about which good they were endowed with, but they were told they could reverse their decision the day after.

In the CT we expected no endowment effect and no differences among FG and UG as well as in the case of the RDT. On the other hand we expected the highest rate of exchange asymmetry in the case of the DDT, but no differences across FG and UG.

Results

In table 1 we report exchange rates between the product types and the proportion tests. Precisely the proportion test calculates whether the proportion of “choosing” a good is the same in case the good has been received as endowment or has been exchanged with the other good.

Table 1: Mean trading percentages and proportion tests to determine exchange asymmetry

| | CT | IT | DDT | RDT |
|-----------------------|-------------------|-------------------|-------------------|-------------------|
| Familiar | | | | |
| Mug → Notebook | 0.591 (N = 22) | 0.207 (N = 29) | 0.062 (N = 16) | 0.250 (N = 20) |
| Notebook → Mug | 0.233 | 0.640 | 0.520 | 0.517 |

| | | | | |
|------------------------------|-------------------|-------------------|-------------------|-------------------|
| | (N = 30) | (N = 25) | (N = 25) | (N = 29) |
| <i>P-value</i> | 0.1911 | 0.221 | 0.005 | 0.104 |
| Unfamiliar | | | | |
| <i>Chalk</i> → <i>Sponge</i> | 0.483 (N = 29) | 0.348 (N = 23) | 0.450 (N = 20) | 0.435 (N = 23) |
| <i>Sponge</i> → <i>Chalk</i> | 0.476 (N = 21) | 0.375 (N = 24) | 0.261 (N = 23) | 0.120 (N = 25) |
| <i>P-value</i> | 0.780 | 0.055 | 0.052 | 0.016 |

The p-values of the proportion tests show existing exchange asymmetry in case of most of the treatments when we consider the UG, except in the case of the CT. On the other hand, when we take into account the FG we observe exchange asymmetry only in the case of the DDT.

Implications

Our results show that object uncertainty is a crucial aspect in the generation of exchange asymmetry given its evidence mostly in the case of unfamiliar goods. On the other hand, when individuals tend to have more established preferences, such as in the case of FG, we observe exchange asymmetry only when a higher attachment is induced by delaying the decision. Our results have important implications in the interpretation of the endowment effect as well as in marketing practices in the real world. Just take into consideration the case of the food market, where technologies may present new and credence features that may be source of uncertainties in individuals' valuations: it is unclear whether the experience of the good will result in less of an endowment effect because individuals cannot form an attachment to a product they do not know, or more of an endowment effect because simply possessing the good makes it more familiar and valuable. Moreover, in markets with simple, costless procedures for exchanging or returning products, e.g., Walmart in the United States, it also unclear to what extent the endowment effect will be present because of the ease of switching between products is so low.

Consumer preferences with exogenous and endogenous information treatment: Willingness to pay for biodiversity-friendly labels on milk and flour in six EU countries

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Keywords: biodiversity protection, consumer preferences, Discrete Choice Experiment, willingness to pay, food labels, agri-environmental-climate policy

Abstract

Problem and relevance

To pivot EU policy in a sustainable direction, the European Commission has launched the Green Deal, with the Farm to Fork Strategy at its cornerstone. This strategy is being implemented “For a fair, healthy and environmentally-friendly food system” through putting sustainable land management measures into practice. These include 1) the reduction of fertilisers and pesticides by 50%, 2) using 25% of agricultural land for organic farming and 3) 10% of agricultural land for valuable landscape elements by 2030.

Furthermore, the Farm to Fork Strategy foresees a proposal for a sustainable food labelling framework to empower consumers to make sustainable food choices. At this point, little is known about consumers' willingness to pay for sustainably labelled products with respect to the criteria mentioned above and how consumers react to different modes of information provision.

The article presents results from a Discrete Choice Experiment that investigated purchasing decisions for such sustainably labelled products. The label applied here focused on a specific objective of the Farm to Fork strategy, namely 10% of agricultural land for valuable landscape elements.

Material and methods

The study explores consumer preferences for “biodiversity-friendly” labelled products in six European member countries: Germany, Poland, Netherlands, Hungary, Spain and Sweden with overall 12000 respondents. The discrete choice experiment was contextualized as a typical shopping situation of a) milk and b) flour. The products were visualized with simple icons and characterized by four attributes presented in Table 1 and 2 below:

Table 1. DCE – Example of a choice situations for milk

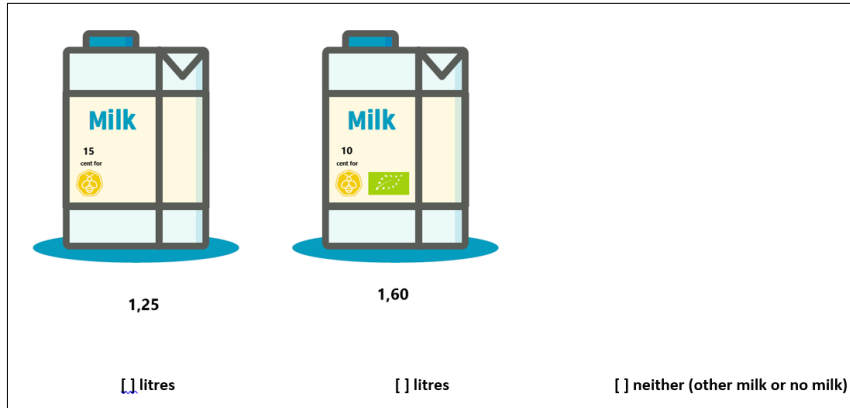
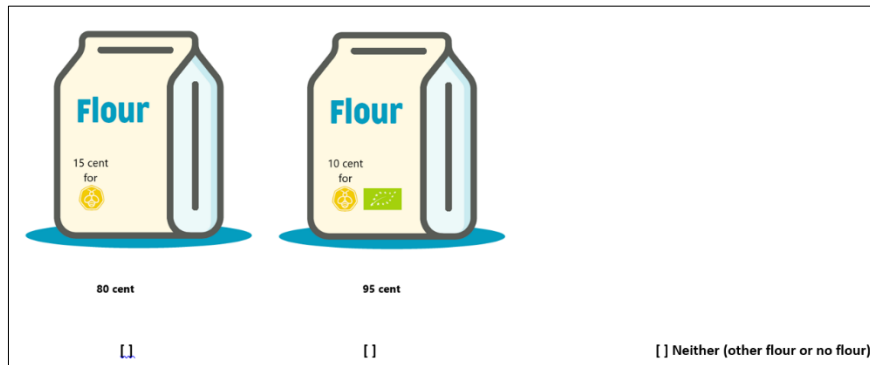





Table 2. DCE – Example of a choice situations for flour



The attributes describing these products were the product label, an additional payment to the farmer and the product price (see Table 3). The Biodiversity label came in two forms based on the mode of farmer payment: practice based payments and results based payments.

Table 3. DCE Attributes

| Attribute | Milk/Flour - levels |
|-----------|--|
| Labels | <ul style="list-style-type: none"> <li data-bbox="826 1514 1433 1592">- No label – which means that the milk comes from conventional production. <li data-bbox="705 1603 1433 1704">  - Biodiversity conservation with payment for practices <li data-bbox="705 1771 1433 1872">  - Biodiversity conservation with payment for results <li data-bbox="699 1951 1433 2018">  - The “EU organic” label |

| | |
|------------------------------|--|
| Price for 1 kg/1l | |
| Additional payment to farmer | <p>Additional payment received by the farmer for each kilogram of flour.</p> <p><i>The price that you pay usually covers various fees and costs, such as collection, transport, packaging, distribution, taxes and many more. Farmers receive only a fraction of the price that you pay in store/This characteristic represents the additional payment farmers would receive for each kilogram of flour/litre of milk sold, relative to the current situation.</i></p> |

Study participants were also exposed to three different information treatments concerning biodiversity in agricultural landscapes: a short introduction with basic information on biodiversity and the European Common Agricultural Policy, long detailed information and endogenous information-seeking treatment, where participants were able to skip information or read the long text instead. This will allow to investigate the relationship between exposition to information about the CAP and purchasing preferences.

In the survey, the labelling system is described as a new EU policy to support biodiversity conservation on farms. We explain that farmers adopting biodiversity conservation measures would be allowed to use the labels to market their products. Farmers would also receive compensation from EU and national government funds for their efforts (values presented). The new labels would indicate that a particular product comes from a farm that maintains a sufficient level of biodiversity, i.e. dedicate at least 10% of their farmland to biodiversity enhancing programs.

Results

In May 2022, we collected a total representative sample of 12 000 adult respondents from Germany, Hungary, Netherlands, Poland, Spain and Sweden who are involved in food shopping for their household and consume both milk and flavor.

When comparing the willingness to pay of the individual countries, a clear picture emerges that Sweden has the highest and Poland the lowest willingness to pay for flour across all attributes. For milk, on the other hand, Poland has the highest and Germany and Spain the lowest willingness to pay. With regard to the additional payments to farmers, however, it is clear across both products that, apart from Poland and Hungary, consumers from other countries are willing to pay more to farmers. A closer look at the characteristics of the respondents reveals that female participants and consumers of organic products show significantly higher willingness to pay.

Looking at pooled sample, there is a slightly higher willingness to pay for milk. Only in the case of the additional payment to farmers are consumers willing to pay more in the case of flour than for milk.

With regard to the split sample, it appears that the exogenous division into short and long information does not make a noticeable difference in the willingness to pay. However, if the respondents themselves can decide whether they want to receive more information, clear differences become apparent. Thus, respondents who asked for more information have a

significantly higher willingness to pay for biodiversity labels than people who refused more information.

Implications

1. Consumers do have a significant WTP for additionally labelled products, regardless if it be flour or milk.
2. By labelling environmentally friendly producers, additional revenues and thus incentives to provide ecosystem services can be created.
3. New labelling schemes should be as transparent as possible and guarantee that farmers receive their fair share. Fairness plays a large role in the purchasing decision in the majority of countries.
4. Information campaigns should be laid out in a way, that basic information is provided to everyone and “further reading” suggestions are provided for more detail.

From experiments to supermarkets: the impact of enhancing purchase environment realism of consumer perceptions

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Abstract

Prior research on the impact of labels has highlighted the differences between findings in laboratory settings and real life shopping experiences (Dubois et al., 2021), a pattern that has been generalized to problem of upscaling lacking the so-called voltage effect (List, 2022). Therefore, assuring that the experimental conditions in laboratory experiments are as close as possible to the setting where the intervention is expected to be implemented remains a significant challenge. In this paper, we evaluate whether modifying the experimental setting to better reflect shopping environments leads to significantly different findings. This is done in the context of the different composition of seemingly identical products (DC-SIP), commonly referred to as dual food quality, debate in the EU, where the presence of products marketed identical while having a substantially different composition is considered an unfair commercial practice.

We conduct an online experiment with 20 000 consumers evenly split across ten European countries evaluating perceptions regarding six products (instant coffee, crisps, baby food, fish fingers, chocolate and yoghurt). Consumers are presented with 10 pairs of products (two pairs for five different products) and asked to declare whether they perceive differences in packages, the degree of dissimilarity between the packages, and if those differences lead them to consider that the products inside the package are different. Products are presented as front of package pictures of hypothetical branded product versions and differ across 8 potential design elements, including claim type attributes (taste, quality, origin, recipe) which can be either present or absent; and package design variants (product description, background colour, picture and positioning of the picture) which can take one of two options. Starting from 24 product versions that were used to construct a d-efficient design, the choice set for the elicitation of perceived differences in packages and products was created manually to capture choice pairs with variation in the number of different elements between options in the choice cards. The implemented set has 12 choice cards and it was checked to ensure that each level of each attribute (design element) were equally distributed across all possible choices (balance) and, ensured that there was no systematic relationship between two or more attributes (correlation). The 12 choice cards were blocked into six groups of two, and each individual saw a group for each of the five products. An example of how these design characteristics are implemented and vary across levels for the case of yoghurt is presented in **Pogreška! Izvor reference nije pronađen..**

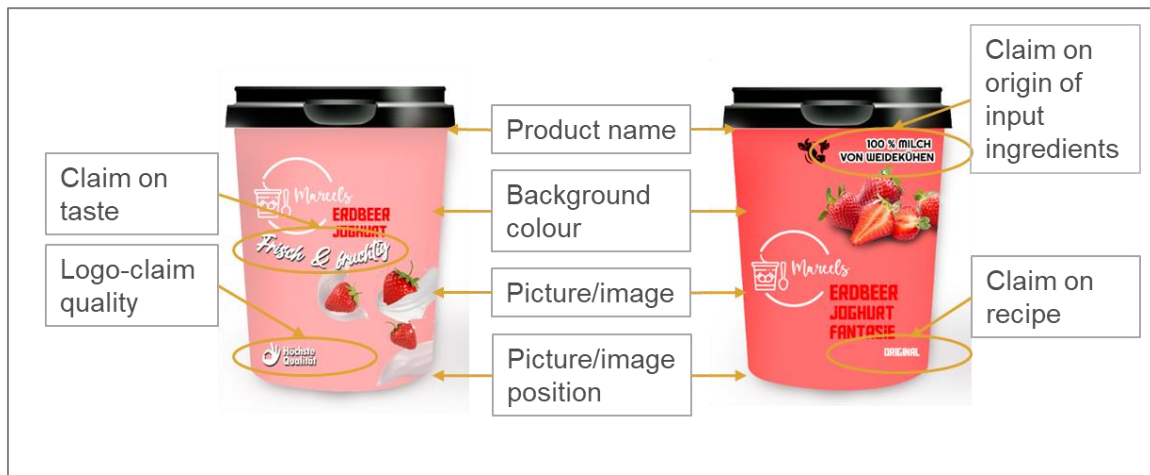


Figure 4. Example identifying the differences in the front-of-pack elements of a pair of product versions (yoghurt used in Germany and Austria).

We apply an experimental design that takes into account how experiments are usually implemented and how shopping decisions are made. Our reference treatment allows consumers to see both packages simultaneously on screen and for a long-period of time. This treatment is then manipulated to take into account that consumers make purchases decisions under time pressure, reducing the time available to inspect products by one third (six versus four seconds) (Silayoi & Speece, 2007). The second experimental treatment changed whether individuals saw each pair of products simultaneously or sequentially (Peri, 2006). The second treatment simulates the fact that consumers would normally not find different packages of the same food product side-by-side in the shop. The choice set block, order of products and the order (in case of the sequential treatment) or position (in the case of the simultaneous treatment) were randomized across individuals. The experimental design is summarized in Table 5.

Table 5. Experimental treatments implemented.

| | | Presentation of the two products | |
|-------------------------------|--------------|----------------------------------|-------------------|
| | | <i>Simultaneous</i> | <i>Sequential</i> |
| Time available for inspection | <i>Long</i> | Reference | T1 |
| | <i>Short</i> | T2 | T3 |

We run logistic regressions for the two dichotomous outcome variables (package difference and product difference) and ordered logistic regressions for the intensity of difference variable). Our independent variables capture whether there is a difference in each of the design elements, the number of differences between the products and the treatment. We also include controls for product, country, socio demographics and purchase motives and habits.

Our results show that the effect of the tested design elements on the probability of detecting differences in package and inferring differences varies across treatments. The variation is not only on intensity but also on the sign of the effect. For example, colour and position of images play a much higher role when the experiment mimics real shopping environments (T3) than in the reference scenario, and some of the design elements that allow consumers to detect differences in the reference scenario such as changes in product description actually reduce the probability of detecting differences in a more realistic setting.

These results have implications both for practitioners and the development of measures to avoid that that DC-SIP implies an unfair commercial practice. Despite not having a pure real shopping environmental contra-factual we show that when implementing food choice experiments, attention should be paid to how the experimental setting is implemented. The

potential impacts of labels or product descriptions might be overestimated not only because of the salience given to specific attributes when presenting the products to consumers (He and Gao, 2015) but also because of choice architecture factors. This could help explain the lack of translation of experimental results when moving to the field. Practitioners should pay attention to trying to resemble purchase environments in terms of availability of products and time. When developing measures to make sure that consumers are capable of distinguishing packages, we also provide insights into which of such differences only allow them to distinguish packages and which, which should be required to avoid unfair commercial practices, also signal that the product is different. In particular, more differences are needed to signal differences in products (all eight elements need to be different for consumers to infer differences in products) and the attributes that most signal difference in products are origin claim, quality logo and colour. Moreover, the impact is product specific, therefore, supporting the case-by-case approach taken by the Commission.

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Understanding consumer acceptance of upcycled food: experimental evidence from Denmark – a preliminary study design

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Abstract

Problem and relevance

The literature around sustainability in the food sector in the 21st century is heavily influenced by research on predominantly plant-based consumption patterns at the final consumer level. It is, however, very thin and limited regarding consumer acceptance of upcycled food items, which are products made from food waste or discarded elements in the production process of another product. Further, there has been a wide range of behavioural and experimental research conducted examining various incentives for individuals by setting environmental motives, such as lowering greenhouse gas emissions and the connected own carbon footprint. At the same time purely egoistic, personal and individualistic motives such as health, taste or financial aspects have been mostly disregarded in experiments and have not yet been subject of intense analysis. It is commonly accepted and exemplified through the public good game that climate or environmental motivations are ineffective and tend to subside after a certain time. Reasons for this lie in the fact that the own contributions appear to be rather small and not that meaningful.

A series of experiments is therefore aiming at closing this existing evident gap in the literature by examining consumers purchasing behaviours regarding an upcycled food item through giving a wide set of individualistic motives including incentives of personal health, taste and financial nature. By doing so, the focus of attention for the underlying reasons of sustainable food choices is shifted and long-term sustainability might be attained.

Material and methods

The Danish start-up company Circular Food Technologies turns crop waste arising from beer production into new products such as flour, chips, cereals and others. Using their upcycled flour, bread will be baked and used in the experiment. This bread constitutes the upcycled food item in the experiment. The experimental setup would be targeted around the overall acceptance and perception of this specific upcycled food made from a waste product.

Hypotheses and questions that shall be investigated include mainly the nudging aspect of living more waste-free and consuming larger shares of upcycled food. Further, it is going to be examined how consumers may value and perceive these concepts and whether there are any tweaks to increase the perceived consumer value for these products? Besides, any existent biases towards upcycled food items and underlying reasons for these biases will be analysed. The focus shall also be set on how to alter negatively associated perceptions to make consumers feel better about the product and hence increase future consumption of the product to have a positive contribution to reduce food waste and thereby the environmental impact of our food choices.

The experiments will consist of three stages that relate to the findings of each previous one. While the first one aims at examining how university students value the conventional bread compared to an upcycled one in a lab setting resulting in a Willingness To Pay, the second experiment aims to reach a more heterogeneous population in a national Danish sample. The

final experiment will then be conducted as a field experiment and therefore represents the most reliable results of the series.

At the conference, detailed settings and the research agenda for each of the three experiments will be presented with the focus on the different intervention strategies (incentives) and their randomisation, instrument usage and framing issues, heterogeneity in the sample, avoiding self-selection biases and stratification in case of the final field experiment.

As stated earlier, given the series of incentives, the focus is aimed to be set on a personal level and moved away from a societal benefit such as a climate benefit.

Results

The experiments are still in the design phase and not yet fully planned and conducted. Hence, detailed results are not yet applicable. However, it is expected that in all three sub-experiments that favoured individual incentives, the sustainable food choice option is predominantly higher than in comparable cases of pro-environmental behaviour incentives assessed in previous studies. Criteria to assess the findings include but are not limited to mostly the share of purchases compared to the ordinary option, as well as the comparison between each individual setup to draw conclusions on which incentive has a more significant impact on consumers purchasing behaviour. A detailed analysis of this can further provide evidence for or against the above-mentioned hypotheses regarding potential biases and counterfactors towards them.

Implications

Further, the overall objective is to produce more advanced products than just flour or chips in the close future. Therefore, researching on behavioural choices towards these food items seems necessary to justify the investment into more advanced food options and ensuring market acceptance.

Gaining insights into how personal motives, such as taste, health and the price influence consumer purchasing behaviour is crucial in comparison to the less long-term effect of environmental incentives given to the consumer. The results can thus be used as a guidance in future impacts on the food system by nudging consumers in more sustainable food choices.

Session 5



The relationship between farmers' risk preferences and risk management: Does the domain of risk preferences matter?

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Abstract

Farmers can mitigate agricultural risks through risk management strategies. Therefore, whether risk preferences are a good predictor of risk management choices is important for policy. As risk management tools are available across domains in agriculture (e.g. production, marketing, investment) whether risk preferences affect these choices may depend on which domain risk preferences are measured in. Using an online survey with Swiss apple growers (N=213), we investigate the role of risk preferences in 6 domains on farmers' choices regarding preventive pest management, on- and off-farm diversification, and insurance uptake. Risk preferences are elicited via a Likert scale for production, market and prices, pesticide use and agriculture in general, the environment and human health.

Probabilistic beliefs and farmers' decision to join the Income Stabilization Tool: A super-contextualized field experiment

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Abstract

The income stabilization tool (IST) is a relatively new risk management option for EU farmers. It was introduced by the CAP 2013 reform but it has been operationalized only in Italy. This paper explores whether first and second order beliefs, risk and ambiguity preferences can explain farmer decisions to join the IST. A super-contextualized field experiment, where farmers make choices considering their own farm characteristics, is conducted with a sample of 150 Italian farmers. All behavioural factors were elicited using incentive compatible and incentivized mechanisms. First order beliefs, risk and ambiguity preferences can help predict farmers' choices to adopt the IST, while second order beliefs do not.

Is gamification a curse or blessing for the design of risk elicitation methods in the field? Experimental evidence from agricultural students and farmers

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Abstract

Comprehension as well as active participation of farmers in risk elicitation tasks is crucial, as otherwise the results are rather noisy than reliable. This paper introduces the Wheel-task, a novel elicitation method that is easy to understand and engaging for the farmers. It follows the wheel of fortune model, where a spin on the wheel determines ones pay-out, while always having the option to choose an alternative safe pay-out. We tested the new method among agricultural students in Germany as well as smallholder farmers in rural Cambodia. We then analysed inconsistencies in choice patterns across different risk elicitation methods as well as its external validity by contrasting real world risk management practices.

Farmers' acceptance of income stabilization tool scheme: A discrete choice experiment

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Abstract

Farmers are exposed to different risks. Besides extreme weather events, increasingly important becomes income risks. Income risks represent changes in farm income due to production, market, and financial risks. To cope with mentioned, European Commission, through Common Agricultural Policy (CAP), introduced a risk management toolkit (RMT). RMT consists of three measures, subsidized agricultural insurance, mutual funds (MF), and income stabilization tool (IST).

In all EU member states, subsidized insurance is applied, while MF and IST, for now, are applied only in Italy. The income stabilization tool (IST) is the latest action proposed by the EU to manage agricultural risks. The main limitations of the application of IST are the lack of national legislation for establishing IST, the lack of clear guidelines, and the lack of practical examples from the EU. The IST aims to stabilize farm income by compensating income losses due to various risks: production, price, market, and financial. Previous literature stated that IST is also known as whole-farm insurance.

This paper investigates farmers' acceptability of the IST scheme in Croatia, where farmers' demand for standard risk management tools, such as private insurance and mutual funds, is low. The primary method used in the paper is a discrete choice experiment (DCE). Additionally, the paper explores behavioral drivers (risk preferences, probability weighting, and subjective beliefs about future farm income) and their impact on farmers' acceptability of the IST, a new tool.

The main findings will discuss farmers' preferences over IST. Additionally, research will discuss how subjective beliefs and risk preferences impact the IST choice. The main findings can help policy makers design the framework for implementing IST among member states and introduce a new risk management tool among EU farmers.

Further research can be conducted among EU farmers to research their readiness to apply IST on the EU level and design IST according to farmers' preferences. Furthermore, conducted research can serve as a basis for researching preferences according to new types of insurance or other on-farm risk management strategies (e.g., new production technologies). According to our knowledge, research is the first attempt to investigate farmers' preferences for IST tool and behavioral variables that impact IST choice.

Keywords: income stabilization tool, discrete choice experiment, risk preferences, subjective beliefs, grape growers, wine producers

Session 6



The role of children's and parents' attitudes in food product purchases

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Abstract

Problem and relevance

The global pandemic of childhood obesity is a major worldwide problem that is strongly affected by the unhealthy diet of children. Parents choose the food that children consume and thus have the greatest influence on their diet (Moore, 2018). Although parents claim that health and healthy nutrition are the most important factors in choosing food products, they often buy less healthy products (Russell et al., 2014). This raises a question: how do parents decide which food products to purchase?

Literature acknowledges two research streams regarding family food purchases. One is focused on the role of parents in shaping children's food habits and preferences, and the other is on children's influence on parents in food purchases (Sigirci et al., 2022). Given that food attitudes and preferences are among the most important factors influencing children's food choices (Marty et al., 2016) it is important to study how children's attitudes affect parents when purchasing food.

To assess real attitudes that guide behaviour, consumers should be aware of them and want to reveal them (Greenwald et al., 2009). However, there is a distinction between what consumers say and how they act (Ackermann & Palmer, 2014), which can be explained by the dual-process model (Fazio & Olson, 2003). The model differentiates two processes in assessing attitudes: one process is slow, conscious, and deliberate (Kahneman, 2011), and the other is fast, unconscious, and automatic (Greenwald & Banaji, 2017). The first process is covered by explicit measures (e.g. self-reports), while the second one is covered by implicit measures (e.g. Implicit Association Test; Greenwald et al., 1998). Even though explicit attitudes are crucial in predicting behaviour, implicit attitudes may predict behaviour outside of the consumer's conscious awareness (Perugini, 2005). Therefore, it is suggested to measure consumers' attitudes using both explicit and implicit measures (Perkins et al., 2008).

To explore how children's and parents' food attitudes may predict food purchases, it is important to gain insights into the actual purchase rather than the one in which parents report their purchasing behavior. This can be done by using real purchase data, obtained through retail chain loyalty cards. Such a comprehensive analysis will provide insight into the extent to which attitudes could prevent children's consumption of less healthy food and lead to concrete recommendations to parents on how to change their children's behavior by changing their purchasing habits.

However, in order to give concrete recommendations for changing children's food-related behaviour, it is necessary to determine the factors that influence attitude formation. This study will focus on two major factors: parents' attitudes and media exposure. Parents have the greatest influence on the formation of food attitudes and preferences for most children (Cornwell et al., 2020) and it is assumed that they pass their attitudes on to their children. Children's media exposure through TV also influences children's food attitudes (Brečić et al., 2022). However, today's children are increasingly using a number of devices (e.g. smartphones and tablets) through which they are exposed to the media (Lukavska et al.,

2021), and it is not known how children's media exposure through other devices affects food attitudes.

Material & methods

Non-probability, convenience sample will be used. The sample will consist of parent-child dyads, that will be selected in the sample based on two criteria: (1) the child participating in the study is between 6-9 years old, and (2) the parent possesses a Konzum retail chain loyalty card.

The Implicit Associations Test adapted for younger children will be used to measure children's implicit food attitudes (Child IAT; Cvencek et al., 2011). The same IAT will be adapted for use among adult respondents and will be used to measure parents' implicit food attitudes.

Children's explicit food attitudes will be measured using a questionnaire (categorization task) developed by Monnery-Patris et al. (2016). In the questionnaire, respondents are asked to rate how much they like a particular food. Parents' explicit food attitudes will be measured with the same questionnaire, adapted to examine food attitudes of adult respondents.

Children's exposure to the media will be measured using the questionnaire developed by Lukavska et al. (2021), which asks parents to estimate the average time per day their child spent in front of a screen (e.g. smartphone).

Children's food purchase requests will be measured by a questionnaire developed by Buijzen and Valkenburg (2003). In the questionnaire, children are asked to estimate how often they ask their parents to buy food.

The purchase of healthy and unhealthy food products will be measured using the data taken from the loyalty cards of the Konzum retail chain. Food products from the receipts will be coded in such a way that they represent the category of healthy products (fruits and vegetables), the category of unhealthy products (products high in sugar, salt, and fat), and others.

Results

In this research, the following relations are predicted:

- implicit food attitudes of children and parents will be positively related as well as their explicit attitudes;
- children's media exposure will be negatively related to children's food attitudes;
- parents' food attitudes will be positively related to healthy food purchases;
- children's food attitudes will be positively related to food purchase requests which will be positively related to unhealthy food purchases.

Implications

This research will determine for the first time which process, explicit or implicit, predicts consumer behavior in the context of food product purchases.

It will also contribute to additional knowledge about family food purchase decisions, where parents often buy and allow their children to consume less healthy food products, even though they know what healthy products are.

This research will gain insights on food attitudes directly from children, thus providing a complete investigation compared to previous research that relied on parents' perspectives on their children's attitudes.

In addition, this research will provide insights into the development of children's explicit and implicit food attitudes emphasizing the influence of parents' food attitudes and children's exposure to the media.

Understanding the Impact of Online Food Advertisements and Emotions on Adolescents' Food Choices²

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Abstract

Adolescence is a critical period for future health outcomes. Food habits and cognitive development are underway, and it is a period of heightened sensitivity to external influences and emotional shifts. We investigate experimentally the individual and combined influence of positive, neutral, and negative emotions and online food advertisements on food choices in a sample of adolescents. Participants completed a food choice task, selecting five snacks out of twenty healthy and unhealthy options. To induce experimental variation in adolescents' emotions, they were assigned to watch two two-minute film clips validated to elicit the targeted emotion. With a second experimental treatment, we randomized whether adolescents were exposed to unhealthy food or non-food online advertisements.

JEL Classification: C99, I12, M37, Q13

Keywords: Emotions, Advertisement, Food choices, Online experiment

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Grocery shortages and consumer shopping behavior

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Abstract

Problem and relevance

At the onset of COVID-19 pandemic, consumer stockpiling and grocery shortages put immense stress on supply chains, especially food supply chains. Empty store shelves increased the vulnerability of low-income and elderly groups who are more likely to be food insecure. The problem of grocery shortages has called for more research in consumer shopping behavior, to understand the factors driving grocery stockpiling. The goal of our study is to investigate the economic and behavioral factors that drive grocery stockpiling behavior, and to identify stockpiling magnitude by each factor.

Consumers' grocery shopping behavior has received considerable attention in the industrial organization (IO) and marketing literature. For cost-minimizing consumers, optimal shopping depends on the structure of the grocery shopping environment. Specifically, consumers need to account for various components of the shopping environment, for instance, product prices (deal hunting), shopping trip frequency, inventory holding cost, and fixed cost of shopping trips.

Within the grocery shopping literature, the topic of consumer stockpiling has been studied in the context of price deals, i.e., consumers stockpile when price deals are available, so they can maintain their consumption at minimum cost [1, 2, 3, 4, 5, 6]. However, stockpiling can also happen due to fear of grocery shortages [7, 8]. When consumers cannot find their preferred products, shopping fixed costs (i.e., opportunity costs) can increase, and consumers would like to stockpile to avoid the high fixed costs. For instance, when there are grocery shortages, searching for close substitutes at the right price or traveling to other grocery stores will take additional time and resources, hence an increase in fixed cost. Our study aims to assess the impact of grocery shortages, via an increase in shopping fixed costs, on consumers' grocery purchase behavior in a lab environment. For comparison, we also study the impact of lower prices and store purchase-limits on shopping behavior.

Material and methods

Our consumer shopping problem is based on the model in Baker, Johnson, and Keung (2021), which we modify for our experimental purposes, while preserving the essence of the model [9]. The consumer problem is to minimize the cost of a constant stream of exogenous consumption (C), given the constraint that value of a shopping trip's fixed cost (k) plus inventory (I_l) is less than or equal to working capital or cash (\bar{I}). At start of a decision period (for instance, a month), consumer chooses delta (Δ), i.e., the interval between two adjacent shopping trips. Equivalently, consumer chooses number of shopping trips with equal interval in between trips. For simplicity, C is assumed to be constant between/across grocery trips, i.e., consumer buys Δ amount of consumption C in every shopping trip.

$$V(\bar{I}; \theta) = \min_{\Delta} \frac{k + \sum_l P_l(\Delta) S_l(\Delta)}{\Delta}, \text{ subject to: } k + \sum_l I_l(\Delta) \leq \bar{I}$$

In terms of notation, $V(\bar{I}; \theta)$ is the cost function, \bar{I} is working capital (cash), θ is vector of model parameters. $S_l(\Delta)$ is the trip size, or the share of consumption from good type l that is sufficient for an interval of length Δ . $S_l(\Delta)$ is expressed in terms of units of good type l . Meanwhile, there are two good types in l , a perishable and non-perishable good. $P_l(\Delta)$ is the

effective price function and depends on trip size. A large trip size (or transaction size) reduces effective price because of bulk discounts, however, there will be holding cost for buying more than a standard trip. $I_t(\Delta)$ is the grocery inventory immediately after a trip. Overall, the above model is rich enough to simultaneously accommodate for grocery shopping environment and household grocery inventory.

We implement a four-arm, within-subject, randomized experiment among university students in a lab environment, to evaluate the causal effect of grocery shortages (via high fixed costs) on average purchase quantity (per transaction). Beside the control arm, the other three arms have high fixed cost, low price, and purchase-limit treatments, respectively. The order of four arms is randomized for each student. All three treatments are predicted to increase average purchase quantity, i.e., lead to stockpiling. The purchase-limit treatment indirectly imposes a high fixed cost. Regarding average purchase quantity as an outcome, we have one main hypothesis, and two exploratory hypotheses. The main hypothesis is that average purchase quantity will increase in the presence of grocery shortages (implemented via high fixed cost treatment) in comparison to the control arm. The two exploratory hypotheses are that each price decrease and purchase-limit will increase average purchase quantity in comparison to the control arm.

To simplify the decision environment for our experimental subjects, we ask subjects in an experimental round to buy 20 units of a standard item (called, item A) in as many transactions (trips) as they prefer. Basically, instead of two good types and two prices, we bundle them up into one item with one price.

Results

We find in a panel fixed-effects regression that an increase in grocery trip's fixed cost leads to stockpiling, i.e., average grocery quantity increases by about 81%. Meanwhile, price decrease and purchase limit treatments increase stockpiling by about 42% and 64%, respectively. Our results are robust to various specifications and clustering of standard errors at different levels. Additionally, since total cost of an identical grocery trip size differs across treatments, we calculate total-cost elasticity of purchase, which is 1.7 (high fixed-cost), 1.6 (purchase-limit), and -1.7 (low-price). Finally, risk and loss aversion don't predict stockpiling.

Implications

Our research contributes to the grocery shopping literature in IO and marketing fields by studying the economic and behavioral sources of stockpiling behavior. The scientific evidence in our study is relevant for food product companies, grocery stores, and policymakers. Food companies may plan for flexible product availability during periods of shock because high trip fixed costs can lead to higher sales volume. Better planning can stave off the effects of supply chain disruptions. Grocery stores may think about appropriate store policies during grocery shortages, to reduce consumers' shopping trip fixed cost without exacerbating stockpiling. Policymakers can provide incentives that help with shopping environments that reduce fixed costs of shopping, hence mitigating the disproportionate impact of shortages on vulnerable groups.

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Does social or environmental information affect German consumers' purchase intention for apples with peel imperfections?

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Abstract

Problem and relevance

Sustainable living is a relevant and omnipresent topic, and to achieve sustainable consumption and production of food is one of the 17 Sustainable Development Goals defined by the United Nations in the (UN 2015). However, about 30 % of the world's arable land is currently cultivated for the production of agricultural products and food that are subsequently wasted (Verbraucherzentrale 2021).

European marketing standards and consumer demand for the cosmetic appearance of fresh fruits and vegetables (FFV) lead to a third of these products being sorted out before they reach the store. Food waste induces ethical issues, significant environmental problems, as well as economic costs for actors in the value chain (TFPC 2019). Regarding the latter, farmers in particular have to bear high costs for producing FFV that flows into inferior use, and would benefit if standards would be adjusted and acceptance of suboptimal produce were to increase. A number of initiatives at the national and European level aim at reducing avoidable FFV waste by increasing consumers' acceptance of imperfect produce that does not fulfill current marketing standards. However, scientific evidence regarding the effects of these informational initiatives—e.g., on the acceptance of those produce by consumers—is mostly lacking (Reynolds et al. 2019).

Given this background, the aim of the study is to investigate the impact of providing different information to consumers on their purchase intention for apples with different degrees of peel imperfections. The paper addresses the following two questions: (1) “What are the effects of either environmental or social information on consumers' purchase intention for apples with peel imperfections?” and (2) “How do consumers' attitudes moderate these effects?”. Thereby, this paper complements prior studies that investigated the impact of slogans or price reductions on consumers' purchase intention for FFV with flaws by providing more detailed background information to consumers.

Material & methods

The experimental study was conducted as an online survey in May 2022. The survey was programmed with the software Qualtrics and took respondents 8 minutes to complete. Data were compiled in cooperation with the market research institute Bilendi. The target sample were German citizens above 18 who were at least partly responsible for grocery shopping and ate apples at least once per month.

The experiment followed a 3 x 3 mixed design with the between-subjects variable experimental condition information (environmental, social, control) and the within-subjects variable peel imperfections (none, slight and moderate peel imperfections). The sample size was determined using G*Power v.3.1. With a power of $1 - \beta = 0.85$ and $\alpha = 0.05$, $n = 717$ participants are needed; to account for possible exclusions, a buffer of 10% was included in the final recruitment. The study received ethical clearance (16_ILR_Zauber_22) and was preregistered at aspredicted.org (AsPredicted# 93186). Participants in all three experimental conditions received a short information text. Participants in the first group on the negative

environmental and climate effects resulting from the wastage of apples with peel imperfections. The ones in the second group on losses to farmers resulting from apples with peel imperfections that are only suitable for inferior use. In the control condition participants read a neutral short information text about apple production.

The study applied a mixed ANOVA to investigate the direct effects of the information texts on participants' purchase intention for apples with imperfections. A moderated regression was used to test for a moderating effect of consumers' environmental-consciousness and prosociality. The data were analyzed using the software IBM SPSS Statistics 27.

Preliminary results

A total of 809 participants met the eligibility criteria (at least 18 years, (partly) responsible for food purchases, eat apples at least once per month) and completed the study. First, descriptive analyses were performed. The three respondent groups were almost comparable regarding their socio-demographics and also approximately representative for the German population. Chi-square tests yielded no significant differences in gender distribution ($\chi^2(2) = .04, p = .980$) and education ($\chi^2(16) = 14.81, p = .539$) but a significant difference in distribution of age ($\chi^2(12) = 22.65, p = .031, \phi = .031$). Therefore, it was controlled for age as covariate in the mixed ANOVA analysis.

The mixed ANOVA did not reveal a significant interaction effect between text condition and level of peel imperfection (Huynh-Feldt $F(3.31, 1330.94) = 1.07, p = .364, \text{partial } \eta^2 = .003$). Analysis of main effects showed a significant main effect of level of peel imperfection on purchase intention (Huynh-Feldt $F(1.65, 1330.94) = 73.51, p < .001, \text{partial } \eta^2 = .084$) and for information condition on purchase intention ($F(2, 805) = 5.11, p = .006, \text{partial } \eta^2 = .013$). The subsequently conducted ANCOVAs and pairwise comparisons of Bonferroni-adjusted post-hoc tests, revealed a significant higher purchase intention for apples with moderate peel imperfections for participants that received the environmental text than those in the control condition after controlling for the effect of age ($p = .027, \text{MDiff} = .37$), and in purchase intention for apples with slight ($p = .014, \text{MDiff} = .32$) and moderate ($p = .033, \text{MDiff} = .36$) peel imperfections between participants in the social and control group. Furthermore, neither consumers' environmental-consciousness nor their prosociality moderates the impact of information on consumers' preferences for apples with peel imperfections. Further analyses, such as clustering participants according to the relevance of apple attributes in their purchase decision will be conducted in the upcoming weeks.

First implications

The results of the study reveal that the two information texts were both effective in increasing purchase intention for imperfect apples, although in the case of the environmental information only for apples with moderate peel imperfections. Thus, communicating the negative effects of neglecting produce with flaws on apple farmers may be a good strategy for convincing consumers to buy apples with minor and moderate aesthetic deviations. Messages emphasizing negative effects on the environment when ignoring apples with peel imperfections can be applied especially in case of moderate deviations in appearance from the standard of the apple's. These effects are independent from consumers' attitudes regarding environmental and social responsibility.

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Consumers Food Choices and the impact of Constraints on Greenhouse Gas Emissions

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Abstract

Between 19 and 29% of greenhouse gas emissions are attributable to the global food system. Changes in this sector ask for the reduction of greenhouse gas emissions in consumers' food choices but such changes necessarily go along with changes in consumers' food basket and may then imply a variation in the associated value of the basket.

The aim of our study is to estimate the variation in the value consumers attribute to their food basket when they are forced to comply with a constraint in greenhouse gas emissions of their food purchases. Because it has been shown that imposing up to 30 % GHG emissions reduction does not affect nutritional quality of the diet, we impose a reduction by at least 20% in g of CO₂ equivalent. We force consumers to respect a constraint in order to isolate the impact of the constraint on consumers' value from possible desire or understanding of the information policy.

We conducted a laboratory experiment with 311 consumers from the region of Grenoble (France) to elicit such food changes and variation in value. Each consumer was asked to compose two food days for herself, representative of two typical weekdays. To do so, consumers chose products among the 228 food items available in the experiment. A food day includes all food and beverages consumed during 24 hours. It is made up of breakfast, lunch, dinner and snacks. The energy intake of two days had to be greater than 2500 kCal. This threshold forces consumers to make credible food choices for two days. Consumers were asked to value the food days in an incentive compatible way using the Becker-DeGroot-Marschak procedure. We are thus able to directly examine the changes made to comply with the constraint and we can measure the changes in utility between the unconstrained and constrained food days.

The results show that people with low calorie intake cannot reach the target but most people do it and decrease their GHG emissions by 21.2% accompanied by a reduction in their calorie intake by 12.5%. The constraint generates a loss in food days' value but which is mainly driven by the reduction in calorie intake.

Session 7



Parametric Prospect Theory: Survey Design, Certainty Effects and Complexity Bias

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Extended Abstract

Problem and Relevance

We develop and implement a new approach to survey design to collect data for parametric estimation of the cumulative form of the Prospect Theory (PT) model. Our model is estimated with experimental data that has been generated using a new approach to survey design that allows researchers to generate more efficient model estimates providing the parameters conform to the consensus distributions within the PT literature. The approach to experimental design, we develop in this paper is based upon two basic principles. One, each task a respondent undertakes needs to be "informative", and two, no task should be rendered redundant by any other task. By employing these two principles, we construct lotteries that are informative and have low pairwise redundancy. Second, we employ our approach to experimental design to elicit and estimate PT parameters. In doing so, we extend existing parametric approaches to the estimation of a PT model to allow, and test, sure-thing bias or certainty effect and for complexity bias.

Materials and Methods

Our approach to experimental design is based on two principles.

Principle 1: Each task should be "informative". A task is "non-informative" if the same option would be chosen regardless of preferences. That is, if two individuals with very different preferences are likely to make the same choice, then that task is not informative about the preferences of those individuals. By contrast, an informative task is likely to reveal different choices by individuals with different preferences.

Principle 2: Any task should not be rendered redundant by any other task (pairwise redundancy). The most obvious example is that tasks should not be repeated. However, more generally, the answer to one task should not be able to predict the answer to any other task across the range of possible preferences. Using these principles, we can construct a set of lotteries that are highly informative and have low pairwise redundancy. A deeper approach would not only look at the pairwise redundancy of tasks but seek to ensure that each task was informative relative to the entire set of tasks. However, this is a difficult computational problem, therefore we do not attempt to operationalise this in our design.

These principles can be formalised using Bayesian inference that seeks to estimate a 'posterior' distribution for the parameters in question. The posterior is the distribution given the choices of respondents and is constructed from the data along with a prior distribution. The more informative this posterior distribution, the better we can make inferences about the parameters of interest. A set of tasks can be chosen that will deliver a posterior distribution with low entropy, or equivalently, high Kullback-Leibler divergence from a

uniform distribution. Under diffuse priors, maximum likelihood estimates are similar to Bayesian ones. Thus, it should be equally applicable to sets designed for Classical estimation procedures.

Sample data was collected in 2019. Session began with the distribution of detailed instructions along with examples of questions and an explanation of the payment process. Next, we distributed the survey instrument containing the choice tasks. We required all survey participants to answer 100 lottery tasks, each composed of two options, with one option always being a sure-thing. The experimental design was composed of 21 tasks in the gain domain, 26 in the loss domain, and 53 in the mixed domain. Our sample contained 143 respondents. Model parameters are estimated using a Hierarchical Bayesian approach that allows for complexity biases and if people have biases towards sure-things or prospects with only two payoffs relative to three.

Results

We estimated four model specifications. The base model (M0) is a standard power form without transforming the value function or allowing for biases. The next model (M1) uses a generalised value function to allow greater flexibility around small payoffs in a way that allows for people to be risk-seeking in low-stakes mixed prospects. M2 further generalises the model to allow for the sure-thing bias only and M3 is the most general and allows for bias in the selection of prospects based on whether they have 2 or 3 payoffs. Model selection was undertaken by employing the Watanabe Akaike Information Criteria (WAIC). Model support indicates the M2 and M3 are supported. In general, we find that people exhibit a bias towards negative sure-things, but the reverse in relation to positive sure-things, though the bias is smaller. The evidence also weakly supports a bias towards three-payoff, relative to two-payoff, prospects. Thus, overall, while biases seem to be present there is no clear uniform bias for or against complexity. More predictable choices are made in the gain domain. We conjecture that the greater predictability and relative absence of bias in the gain domain are due to respondents finding gain domain tasks cognitively easier, or perhaps because they are more ambivalent towards making loss and mixed domain choices.

Implications

Respondents do have biases about sure things. Positive and negative sure-things had their utilities reduced in absolute terms meaning that there was a bias towards negative sure-things but biased against positive sure-things. The bias was much greater for negative sure-things relative to positive ones. Accounting for this bias led to having a slightly convex value function in the loss domain for a majority of respondents, whereas without this adaptation the value functions were predominately concave in the loss domain. Allowing for biases did not substantially change the values of the probability warping parameters. While evidence of probability warping was present (i.e. they were different from unity) these parameters did not universally reflect the consensus values in the literature. In particular there seemed to be a tendency to overweight the middle values of prospects in the loss domain. Our results weakly support the contention that people favoured the three-payoff, relative to the two-payoff, prospect. More generally, if there is complexity bias, careful consideration of what individuals find complex is important. Specifically, our respondents had greater predictability when making choices in the gain domain relative to making either loss domain choices or mixed domain choices. There may be many reasons for this, but one may be that for some reason people are more easily able to make choices in the gain domain relative to the mixed and or loss domain choices, and this may be why they were more likely to display sure-thing bias for sure-thing losses. Another possibility is choosing

between a three-payoff prospect and a sure-thing may not be cognitively more difficult than when completing a two-payoff vs sure-thing choice.

Looking to the future, we believe that it might be possible to improve on the design procedure we have employed here. One possibility is that Machina Triangles are employed in proposing good prospect pairs in the first instance before they are subject to the elimination procedure that we employ. With regard to our modelling, the value function has been more flexible than is typical. However, there is the possibility that the use of even more flexible functional forms would eliminate the evidence for what we have termed complexity bias. Future work might investigate whether this might be the case.

Consequentiality in a discrete choice experiment: evidence from query theory

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Abstract

Problem and relevance

Choice experiments suffer from the well-documented limitation of hypothetical bias: the difference between what a person *says* they would pay and what a person would *actually* pay (de-Magistris et al, 2013; Murphy et al., 2005). Much academic research has been devoted to developing techniques to mitigate such bias. A consequentiality script is one *ex ante* approach used reduce or eliminate hypothetical bias by increasing participants' perceptions that their responses influence an outcome that they care about; however, the literature on the use of consequentiality scripts in private markets in a discrete choice experiment setting is still developing. When respondent behavior in a DCE does not reflect real world decision making, such behavior should be identified and removed through either survey design (*ex ante*) or post-survey calibration (*ex post*) (Loomis, 2014). Following the procedures outlined in Kemper et al. (2020) we use Query Theory (Johnson et al., 2007) to examine the mental queries of respondents when confronted with choice tasks in our choice experiment. Order and content (value-increasing or -decreasing) of queries influences choice behavior. Query Theory uncovers the thought processes of individuals by the use of a simple aspect-listing task, employed during each choice task.

Materials and methods

Our study examines the effectiveness of a consequentiality script in a discrete choice experiment and employs Query Theory to document the mechanism behind this technique. Heringes et al. (2010) used *policy* and *payment* consequentiality to describe two areas of consequentiality to emphasize in the evaluation of a public good. Unique to our experiment, we developed a modified script with adapted terminology for use in a market setting with a private good. Specifically, we developed a script that suggested to respondents that their answers could influence future product offerings (*product* consequentiality) and that their choices should reflect their true preference and that they should consider that their budget for other purchases will be reduced by the same amount as the dollar amount in their choice (*budget* consequentiality). By emphasizing both *product* and *budget* consequences to participants, we hypothesize that this would induce them to put more effort into the choice task. Our script was adapted from Drichoutis et al. (2015), Vossler and Watson (2013) and Vossler and Evans (2009) to emphasize *product* consequentiality and additional language to emphasize *budget* consequentiality was adapted from cheap talk scripts developed by List (2001).

Data were collected in 2016 in the United States by Survey Sampling International using a web-based choice experiment survey. The panel consisted of 1,505 primary household grocery shoppers randomly placed into one of three treatments with approximately 500 participants per treatment. The experiment consisted of two tasks. First, respondents participated in a DCE where they made choices between poultry products differentiated by

price, genetically modified ingredients, local production, and carbon footprint. Second, respondents completed a survey regarding their perception of the consequentiality of the DCE. The study uses a between-subject design where respondents participate in only one of the treatments and because our target population is consumers and not students we have a non-standard subject pool (Harrison and List, 2004). Each respondent was presented with eight choice tasks, where each choice task included a no-buy option and two product options. The allocation of attribute levels to alternatives was designed following Scarpa et al. (2007), using a sequential Bayesian design. Respondents' preferences and willingness to pay were analyzed using a discrete choice framework consistent with Random Utility Theory (McFadden, 1974) and Lancaster Consumer Theory (Lancaster, 1966). Our utility function was specified in willingness to pay space.

We use Query Theory to offer a deeper psychological explanation for the valuation differences observed in the experiment. Following Johnson et al. (2007) and Kemper et al. (2020), we used a verbal report method called “aspect listing” to obtain a proximation of the aspects, i.e., thoughts, in each choice task of the experiment. This allows us to compare the aspect-listing results across treatments to test for differences between the two controls and our experimental treatment when subjects were under the honesty oath. Respondents were asked to list their thoughts during each of the eight choice tasks of the experiment. Then, the aspects were categorized and analyzed to identify any significant differences between treatments based on 1) order of thoughts and 2) content (value-increasing or -decreasing) of thoughts.

Results

Our results suggest that a consequentiality script can significantly lower willingness-to-pay values when compared to control and inconsequential treatments. Responses to *ex-post* consequentiality questions confirm that the script does influence respondents' perceptions of the likelihood that their responses will be used in product and pricing decisions. However, limited evidence was found to indicate whether *product* or *budget* framing had a stronger influence on the perception of consequentiality associated with the script. Our Query Theory results are similar to those associated with the use of the honesty oath in Kemper et al. (2020); however, the consequentiality script appears to have a less substantial affect on 1) the order and 2) content of thoughts listed by respondents as they make decisions during the choice experiment. These results suggest that, while the consequentiality script has documented usefulness in a dichotomous choice setting where a clear consequence can be identified (e.g. casting a vote to increase public funding for a cause), it is less effective in a market-based choice setting such as our experiment. The honesty oath outperformed the consequentiality script by comparison, as demonstrated by our econometric and Query Theory results.

Implications

The main contribution of our work is the documentation of how the thought processes of respondents in a choice experiment are influenced by the use of a consequentiality script. Our results demonstrate that the script can produce significantly lower willingness to pay estimate in a choice experiment by changing the order of thoughts as well as the number of value-increasing and -decreasing thoughts. Importantly, our study extends the work of Kemper et al. (2020) by demonstrating the usefulness of Query Theory to examine the thought processes of research subjects in hypothetical valuation studies.

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A meta-analysis on induced value auctions

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Abstract

Problem and relevance

The extant literature on experimental auctions has produced various inconsistent and sometimes contradictory results. Although there is some obvious progress on applied pricing research, pricing decisions made by numerous companies do not entail a deep understanding of the potential pricing decisions of consumers, and result in inconsistencies. In the existing literature, there are many potential reasons behind differences in Willingness to Pay (WTP) estimates elicited with experimental auctions. Liu et al. (2010) argue that statistic errors and the effect of moderators are two basic factors that cause this kind of inconsistencies. Another reason is that bidding behavior is sensitive in auction design (Shogren et al., 2001). This leads to questions about whether the choice of auction mechanism may be one of the reasons that causes conflicting results in bidding behavior (Grether, 1994). The goal of this study is to better understand what kind of additional factors, along with the type of auction, are responsible for the heterogeneity in bidding behavior. Meta-analysis is relatively new in the field of experimental economics and its use is still limited. Recently, there have been a few attempts to synthesize the plethora of experimental auction studies in order to find some common denominators. However, these studies have mostly been restricted to the analysis of a single auction design, a specific behavioral domain, or a unique category of product, thus, being unable to draw broad conclusions.

This study is meant to evaluate the state of the art, to urge the discussion on experimental auctions' design choice, and to bring about a critical re-evaluation of the relevance of experimental factors affecting the size of heterogeneity that has been detected between consumers' offered bids. Hence, important unanswered questions arise, about whether effective choice of auction design, or kind of incentive, and other interventions overall that so far have remained undetected, affect decision making. Herein, the use of meta-analysis will enable to the assessment of the impact of multiple factors, that have not explicitly been investigated yet, on bidding behavior for fictitious products, with a focus on induced value auctions.

Material & methods

To fulfill the goal of our study, this research will adopt an eight distinct step procedure (Hansen et al., 2022) to conduct the meta-analysis. Those steps include: 1) definition of the research question, 2) literature review (search strategies, study inclusion criteria), 3) choice of the effect size measure (type of effect sizes, conversion of effect sizes to a common measure), 4) choice of the analytical method used, 5) choice of software to perform meta-analysis, 6) coding the effect sizes (inclusion of moderator variables), 7) analysis (outlier analysis and tests for publication bias, model choice), 8) reporting results. The dependent variable of the research is a relative measure of bid deviations $\frac{bid-IV}{IV}$. The independent variables that will be used are the auction design choice, type of subject pool, setting of the experiment (lab, field), country of study, type of reward/incentive, type of experimental currency units (ECUs, tokens), number of subjects participated in the induced value auctions, time of publication, year that data were collected, provision of training before the

experiment, subject design (between or within), gender, task type (WTA, WTP). Keyword searches (i.e., induced value auction(s), Vickrey auction) have been conducted in databases such as EconLit, Google Scholar, Web of Science, EconStor to collect all primary studies. We are currently in the process of contacting authors from these studies to request their raw data.

Implications

This research will offer a deeper understanding of the underlying reasons that affect consumers' decision-making. Results from the meta-analysis, will be valuable for both academics and policymakers to study and make the right decisions for measures that involve trade off decisions. It will also be useful for the marketing strategies that companies have to follow to effectively promote and price their goods.

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Conservation auctions in the presence of spatially endogenous bonus: A landscape approach for biodiversity conservation

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Keywords: Conservation auctions, wildlife corridors, endogenous bonus, spatial coordination, transaction costs

Abstract

Problem and relevance

Habitat fragmentation has been criticized as a primary cause of biodiversity loss and impairment of ecosystem functions worldwide. For instance, in central Europe, highly fragmented calcareous grasslands have caused the extinction of many vascular plants and butterfly species. Habitat fragmentation is mainly induced by human interventions, especially the intensification of agricultural activities on private farmland. Land retirement programs aiming to remunerate private landholders, who voluntarily set their land aside for establishing wildlife corridors or stepping stones have been put into place to combat habitat fragmentation. In order to allocate contracts to private landholders, conservation auctions have been promoted as innovative mechanisms to cost-effectively achieve environmental outcomes at landscape scale, such as the Conservation Reserve Program in the US.

Several lines of evidence suggest that auction performance is sensitive to whether the information about environmental management goals is publicized. However, to date, there has been little agreement on the nature of such information effect. Some studies found that providing bidders with the information about environmental quality of lands could improve auction performance since it increases the probability of enrolling high-quality lands in the programs. By contrast, others suggest that revealing such information might reduce auction performance as it exacerbates rent seeking behaviour. Landholders are likely to tender higher bids if they know that they are offering a service of high quality. It is worth noting that existing experimental studies adopted a non-contextualized experimental design to avoid the effect of intrinsic motivation that may affect bidding behaviour. However, we cannot exclude the possibility that in an environmentally contextual setting, having a better knowledge of the spatial aspect in the government's objective function, landholders who are motivated more by environmental concerns might not ask for high compensation. Since landholders self-determine the markup as a result of knowing spatial environmental management goals, we term the effect of disclosure of environmental goals as the effect of a spatially endogenous bonus. The impact of an endogenous bonus on bidding behaviour still remains unpredictable. There remains a paucity of evidence on the conditions under which the endogenous bonus could enhance auction performance in delivering landscape-scale environmental benefits.

Despite the advantages of auction mechanisms over fixed-rate payments, such as mitigating adverse selection and improving cost-effectiveness of conservation programs by fostering competition between landholders, real-world auction programs have suffered from low participation rates due to the perceived complexity of bidding process. Such resistance tends to be even stronger when private landholders are required to coordinate their bidding strategies for achieving spatially contiguous land management. However, little knowledge is known about the mechanisms that underpin landholders' willingness to incur transaction costs for auction participation.

The aim of this study is therefore twofold: 1) to investigate the nature of the effect of the spatially endogenous bonus on auction performance across different types of landscape configuration where spatial correlations between compliance costs and environmental benefits are nil, negative, or positive; and 2) to examine whether the presence of the spatially endogenous bonus could increase willingness to incur private transaction costs for coordinating conservation efforts across different farms.

Material and methods

We carried out a series of controlled lab experiments with 180 students at Kiel University, Germany, from November 2021 to March 2022 via Z-tree Unleashed. The experiments followed a three-by-two design varying spatial configuration of the landscape (uncorrelated, positive, and negative) and the availability of information about the spatial management objective (with/without information) in a stylized agricultural landscape, where the general management goal is to establish corridors and/or stepping stones to link two fragmented habitats, thereby facilitating the movement of wildlife species. The subjects were given the option to communicate at a cost with their neighbours to negotiate/coordinate their conservation activities and bidding strategies.

The subjects were told that wildlife corridors are ecologically more effective than stepping stones, and that the longer the connectivity, the better habitat fragmentation can be mitigated. This is reflected in the government's objective function. The government places higher environmental value on corridors than on stepping stones. The longer the stepping stones, the higher are the environmental values generated. Information about such ecological gain of spatial coordination of conservation efforts was revealed in some treatments but not in others. We adopted the auction format of a multi-period discriminatory-price auction with a budget constraint and unknown endpoints. The subjects were told that the government buys corridors and stepping stones that can generate the highest environmental value per dollar spent until the budget is exhausted.

Results

We found that the endogenous bonus reduces rent seeking, promotes higher degree of spatial coordination, and improves the cost-effectiveness of the auctions in landscapes where environmental values and compliance costs are either negatively correlated or uncorrelated. The opposite effect was found in the landscape with a positive correlation of values and costs. In the presence of an endogenous bonus, people tend to bid less aggressively on the low-cost parcels with high environmental values under the negative landscape to bring in the high-cost parcels with low environmental values. By contrast, landholders tend to seek higher rents from the parcels with low environmental values but having advantage location to form connectivity with their neighbours under the positive landscape. The results also show that revealing the spatial management objective function has boosted landholders' willingness to incur private ex-ante transaction costs under the negative landscape type, thereby increasing the degree of spatial coordination. Pro-environmental behaviour was found to play a role in explaining landholders' bidding behaviour and their willingness to incur private transaction costs.

Implications

This study has significant implications for understanding how the performance of an endogenous bonus depends on landscape configuration. The endogenous bonus would be an effective approach to improve auction performance when landscape configuration is such that environmental values and compliance costs are negatively correlated. However, the results also warn against the adoption of a spatially endogenous bonus in landscapes where

values and costs are positively correlated. In such landscapes, the endogenous bonus could impair auction performance.

Session 8



Understanding farmer's behaviour towards the application of artificial intelligence. Evidence from smallholder farms in Poland, Romania and Lithuania

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Abstract

Problem and relevance

Traditional classical economics, based on the concept of rational choice of *homo oeconomicus*, assumes that economic agents strive to maximise economic benefits. However, such a microeconomic approach is not free of drawbacks, as it does not take into account a number of external effects that accompany the activity of a single actor. In agriculture, they may have a negative character, such as deprivation of weaker farms and degradation of the natural environment, as well as a positive one, connected with providing the so-called public goods. Therefore, for several decades, the development of the agricultural sector has been discussed in terms of its sustainability. Sustainable development plays an important role in shaping economic, social and environmental governance in rural areas. In this development, the importance of small-scale farms is emphasized. Their sustainability is determined by many factors and, in recent years, significance of modern technologies and artificial intelligence (AI) has been pointed out, especially with regard to beneficial effects on economic performance and natural resources. According to the classical economics approach, the application of AI tools is rational behaviour. However, as the research known so far indicates, the level of implementation of these solutions is very low, especially in the case of small farms. This fact can be explained by adopting the perspective of behavioural economics based on the results of sociological and psychological research. In the behavioural approach, we reject the assumption of the rationality of economic decisions and seek to understand the premises that guide a given entity (in this case, the owner of an agricultural holding) in taking actions. We refer to determinants of psychological and sociological nature shaping attitudes of agricultural producers. The questions and statements found in these interviews fit into the theory of reasoned action (TRA). In this context, we see a close relationship between behavioural factors and the propensity to apply modern technologies in smallholder farms. Therefore, the aim of the study is to answer the question whether and to what extent AI technologies are used by small-scale farms. It is also about learning about the behavioural determinants that encourage or discourage the use of modern technologies. In addition, as selected farms with a high degree of sustainability participated in the survey, the authors ask whether there is a synergy between sustainability and the degree of adaptation of modern technologies. Obtaining answers to the research questions makes it possible to formulate recommendations for agricultural policy regarding the implementation of artificial intelligence in the smallholder sector.

Material and methods

Small-scale family farms from three countries belonging to the European Union – Poland, Lithuania and Romania were included in the analysis. The following criteria were adopted: utilized agricultural area up to 20 ha UAA, standard output up to EUR 25,000 and at least 75% of the family members' labour input involved in agriculture activity. In the first stage, the analysis was based on surveys (direct interviews) conducted in 2019. The samples numbered 710 farms in Poland, 1000 in Lithuania and 900 in Romania. Questions concerned

four areas: general farm features, economic and social issues, environmental aspects and connections with the market. In the second stage, using these data, we ordered farms according to the authors' synthetic sustainability measure. The multiobjective stochastic CRITIC–TOPSIS approach was applied for creating this index. Then, from each country, we selected the 20 most sustainable farms (the so-called 'Top-20'). Among these entities, direct in-depth interviews were conducted, what was the focus of our research. The interviews took place in 2020 and involved research project members. Therefore, in total, detailed information was collected from 60 farms from Poland, Romania and Lithuania. In-depth interviews offered a comprehensive picture of reality and met the criteria of interpretative evaluation as perceived by the individual. We used a rare qualitative research approach (assessing the behaviour, attitudes and opinions of agricultural producers) which is a kind of contribution to the analysis of the phenomenon. To the best of our knowledge, there are no similar studies for Central and Eastern European countries, hence it is reasonable to conclude that the research fills a gap in this area.

In the first phase of the study, a comparison was made between the attitudes of farm owners regarding the use of new technologies (AI) in agriculture. For this purpose, statements concerned both cognitive (knowledge), behavioural (behaviour) and emotional (attitude, norms) components were used. The owners' statements reflected the components influencing the final behaviour according to the reasoned action theory (TRA), which is a psychological theory that links beliefs to behaviour. It is assumed that behavioural intention is the most proximal determinant of human behaviour. In the second step we analysed the questions about the use of artificial intelligence, its impact on the work and the barriers associated with the use. In addition to experience and knowledge, which determined the actions of the actors surveyed, an additional external factor was introduced into the model - fear of using new technologies. The links between the individual statements and open-ended questions in the questionnaire and the areas affecting the final behaviors according to TRA are reflected in Figure 1. and Figure 2.

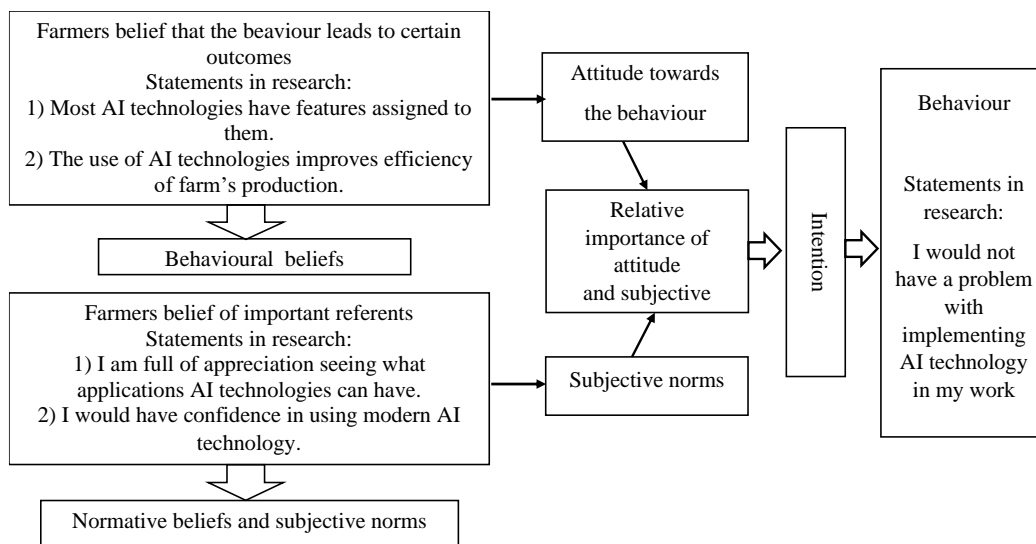


Fig. 1. Statements reflecting the influence of cognitive and subjective components on the implementation of AI technologies in the interviewed farms

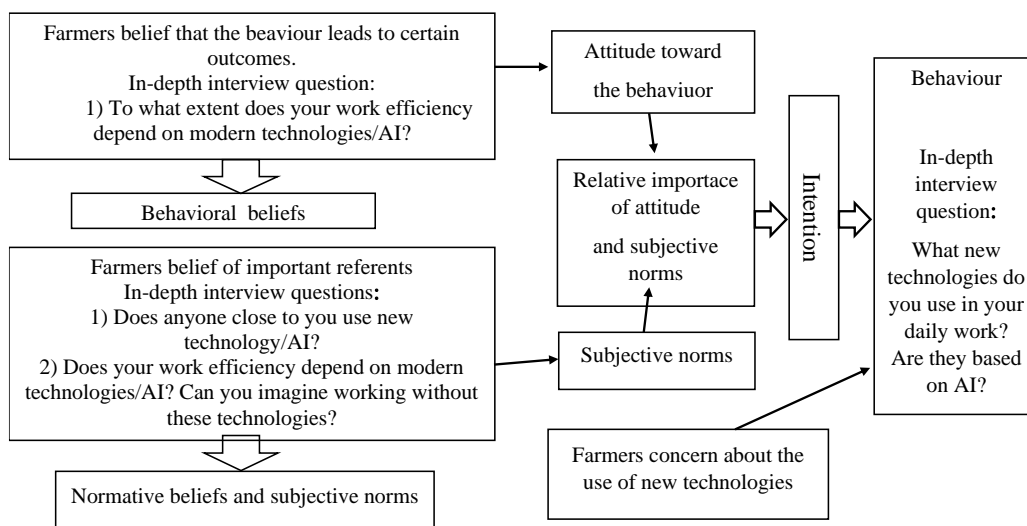


Fig. 2. Questions reflecting the influence of cognitive and subjective components and opinions on the implementation of agricultural AI technologies in the interviewed farms.

Results and implications

The most favorable attitudes and opinions about new technologies (AI) were found in the case of small family farms in Poland. Farmers from Romania were in second place and Lithuania in the third place. These outcomes concerned both declared behaviour, knowledge and emotions. The owners of the surveyed farms mostly agreed with the statement that they are ‘full of appreciation seeing what applications modern technologies/AI can have’. There were also high average values for the statement ‘The use of modern technologies/AI improves efficiency of farm's production’. For the most part, farmers agreed with the statement that ‘Most technologies/AI have features assigned to them’. These values for the individual statements lead to the conclusion that the farmers surveyed were characterized by a high belief in new technologies. But on the other hand, relatively low values for the statement ‘I would not have a problem with implementing AI technology in my work’ indicate that despite the perceived benefits of AI, farmers are not fully willing to implement such solutions themselves. This points to the contradictions between rational, from an economic perspective, thinking and irrational, emotion-based behaviour.

When it comes to the actual use of AI, all respondents stated that they did not use these technologies in their work. Further results indicated that the lack of use of artificial intelligence is typical for the group of small-scale farms, as farmers could not give an example of such use among family, friends, acquaintances. However, there were examples for large-scale farms and agricultural companies. This demonstrates that the implementation of artificial intelligence in the agricultural sector is clearly differentiated by farm area and scale of production. This was one of the most important barriers mentioned by the interviewed owners of small-scale farms. The interviewees also pointed to too high price/cost of implementing, lack of knowledge and some of them claimed that they did not see the need to use AI, which resulted from their attachment to traditional agricultural production methods. At the same time, the small share of positive answers to the question about plans to use AI in the future shows a lack of interest in innovative solutions.

The conducted research proves that the level of use of modern technology in small farms, even those with a high sustainability index, is in practice zero. This fact manifests the necessity of dedicating artificial intelligence-based solutions to this group of actors. Firstly,

organizing a series of training courses on the application of artificial intelligence among small farms is substantial. Understanding the importance of using modern technology and learning about its benefits can convince farmers to apply AI. Secondly, in view of the limited funding possibilities, the creation of targeted subsidy instruments (e.g. under pillar II of the CAP) is recommended, as well as developing systems of cooperation in the purchase and use of innovative machinery and equipment. Thirdly, state or local authorities can be expected to provide broadband Internet guarantying access to powerful computers connected to Cloud and big data.

Fallow, landscape features or semi-natural meadows: exploring farmers' preferences for three biodiversity measures in Slovenia

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Abstract

Problem and relevance

Due to agricultural intensification, farmland biodiversity has been declining drastically both in Europe [1,2] and Slovenia [3]. Among the greatest threats wildlife species face in intensified agricultural land is habitat loss, as non-productive landscape features that are important for biodiversity are being removed [4]. At the same time, grasslands are increasingly improved through fertilisation or used as pastures, affecting the food supply and reproduction for plants and animals [5,6]. So far, the agri-environmental measures that are part of the Common Agricultural Policy have been insufficient to prevent biodiversity loss in farmland ecosystems [7].

Here, we focused on three measures that can support the provision of key habitats for farmland biodiversity and increase landscape heterogeneity. These are maintenance of woody landscape features, such as hedgerows and solitary trees, [8], ungrazed, unfertilized and late-mown semi-natural grasslands [6], and fallow on arable land [9]. We created a hypothetical agri-environmental scheme where farmers are paid for dedicating a certain proportion of their land to these measures. To determine the utility of implementing each of these measures and farmers' willingness to accept such a scheme, we conducted a discrete choice experiment, where we presented farmers with different proportions of land under each measure and annual payments. The study was conducted in two Slovenian regions, Ljubljansko barje and Dravsko-Ptujsko-Središko polje, which differ in farming intensity.

Material & Methods

We designed the experiment as a hypothetical agri-environmental scheme with four continuous attributes, namely the proportion of farm's land under semi-natural meadows, fallow land and landscape features, with levels ranging from 0 to 10 %, and the annual payment for the whole farm area with four levels (50 to 270 EUR/ha). We used NGene software (ChoiceMetrics, version 1.3) to build an efficient design using D-error measure, where the priors were selected based on a pilot study with 41 farmers. The final design contained 3 blocks of 8 choice cards with two alternatives and an opt-out option. Data were collected using face-to-face interviews that took place between March and May 2022. All farmers that had at least a part of their land in the study areas and managed at least some arable land were invited to participate. The interview consisted of three parts: (1) mapping of relevant habitats on the farm and calculation of their current area; (2) choice task and (3) socio-demographic questions.

To determine the utility of fallow land, woody landscape features and semi-natural meadows we used a conditional logit model and the Hausman test to check the IIA assumption. Mixed logit model was used to relax the IIA assumption and allow for the heterogeneity of preferences [10]. We estimated willingness to accept (WTA) and calculated confidence intervals using delta method. All data analyses were conducted in Stata (StataCorp, version 16.1).

Results

We conducted 477 interviews, of which 51 (10,7 %) were removed from further analysis as protest respondents. The final sample size was thus 426 (Table 1). We first analysed the data using a conditional logit model, but as the results of Hausman test showed that the IIA assumption did not hold, we continued the analysis with mixed logit models, where the best fit was achieved when only payment was kept as a fixed parameter (Table 2). All attributes were statistically significant and indicated negative utility, except for the payment attribute, where the effect was positive. Given the significantly negative ASC, farmers were more likely to enter the scheme than to choose the statusquo option.

Table 6: Summary of participants' demographic characteristics (n=426)

| Characteristics | Summary |
|---|--|
| Age | mean= 56.60, sd = 13.19 |
| Gender | M= 328 (77.00%) F= 98 (23.00%) |
| Experience | 0 <10 years of experience 11 (2.58%) >10 years of experience 415 (97.42%) |
| Education | Primary school or less 67 (15.72%) Secondary school 275 (64.55%) Higher education 85 (19.85%) |
| Income from farming as proportion of total household income | >75% 69 (16.20%) 50-75% 43 (9.86%) 25-50% 105 (22.77%) >25% 243 (51.17%) |
| Farm size (A) | median= 944.50, mean= 1785.55, sd = 5881.66 |
| Farm type | Cattle farm 129 (30.28%) Mixed livestock farm 73 (17.14%) Arable farm 135 (31.69%) Mixed farm 89 (20.89%) |
| Proportion of rented land | of Mean= 20.23, sd = 23.84 |
| Enrollment in AEM | in 177 (41.55%) |
| Organic farming | 31 (7.28%) |

In our experiment, WTA should be interpreted as the payment per hectare of the entire farm for each additional percentage of the particular measure. WTA was the highest for landscape features (33.44€/ha per 1% of farmland), followed closely by fallow (30.17€/ha per 1% of farmland), while WTA for semi-natural meadows was somewhat lower (21.62€/ha per 1% of farmland). The standard deviation was statistically significant for all parameters, which indicates considerable preference heterogeneity among farmers. Based on kernel density estimation, there seem to be two distinct groups of farmers with regards to their preference to all three measures.

Table 7: Mixed logit model results

| Parameters | Coef. | Std. Err. | z | P> z | lower 95% CI | upper 95% CI |
|---------------------|-----------|-----------|---------|-------|--------------|--------------|
| Payment | 0.011 | 0.001 | 18.540 | 0.000 | 0.010 | 0.012 |
| Fallow | -0.326 | 0.027 | -11.970 | 0.000 | -0.379 | -0.273 |
| Landscape features | -0.361 | 0.028 | -13.130 | 0.000 | -0.415 | -0.307 |
| Semi-natural meadow | -0.234 | 0.021 | -10.880 | 0.000 | -0.276 | -0.192 |
| ASC* | -1.596 | 0.333 | -4.800 | 0.000 | -2.248 | -0.944 |
| <hr/> | | | | | | |
| SD | | | | | | |
| Fallow | 0.294 | 0.232 | 12.700 | 0.000 | 0.249 | 0.340 |
| Landscape features | 0.293 | 0.025 | 11.950 | 0.000 | 0.245 | 0.341 |
| Semi-natural meadow | 0.222 | 0.019 | 11.470 | 0.000 | 0.184 | 0.260 |
| ASC | 3.686 | 0.289 | 12.760 | 0.000 | 3.120 | 4.252 |
| <hr/> | | | | | | |
| LL | -2,328.23 | | | | | |
| AIC | 4,674.45 | | | | | |
| BIC | 4,739.55 | | | | | |

*ASC was coded as the opt-out option.

Implications

Our study examines farmers' preferences towards a potential agri-environmental scheme where farmers dedicate a set proportion of their land into three key measures to prevent farmland biodiversity loss: fallow, semi-natural meadows and landscape features. We found that all three measures generated negative utility for farmers, which was expected given that these are less or even non-productive areas, hence generating a loss of income [11,12]. Landscape features had the highest disutility, hence the payment for farmers to plant new trees on their farmland would be the highest, followed by fallow land. Landscape features might be the most disliked because once planted, they remain on the farm for many years and thus prevent year-to-year changes in production. Farmers' comments about fallow during the interview indicated a worry about food production loss and disapproval of the measure, unlike in other European countries [13]. Such a negative attitude likely increases

the disutility of fallow. On the other hand, semi-natural meadows are the only measure that can have some productive value when used for farm litter, hence its disutility might be lower compared to the other two measures. The considerable preference heterogeneity could stem from the different existent representation of the measures on farmland. Additionally, farmland usage under measures, particularly meadows, might differ depending on farm type, again giving rise to preference heterogeneity.

Conservation of semi-natural and non-productive features in agricultural landscapes is a highly relevant policy issue, with only a handful of countries worldwide currently enforcing minimum area requirements for conserving such habitats [14]. However, success of voluntary agri-environmental schemes, which could be used for promoting such measures, is closely related to their effective design, which needs to be in line with farmers' preferences [15]. Our results can be used to guide the design of future agri-environmental policies in Europe in order to prevent further farmland biodiversity decline.

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Using Choice Framing to Improve the Design of Agricultural Subsidy Schemes

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Keywords: Prospect theory, nudging, environmental behaviors, farmers

Abstract

Existing agri-environmental schemes have often suffered from poor uptake. We leverage insights from behavioral economics, in particular mental accounting and loss aversion, to test if we can encourage greater participation in environmental initiatives. Using a randomised survey experiment on UK farmers, we find that framing the same policy options in different ways can lead to significant shifts in farmer behaviors. In particular, our findings highlight the following considerations for the design of future policies: (1) whether the application costs are integrated into or segregated from a subsidy is important, (2), the labeling of agricultural schemes may affect expenditure allocation, and (3) reference points can affect the evaluation of new scheme alternatives

Introduction

We leveraged ideas stemming from mental accounting and loss aversion to experimentally test three hypothetical policy modifications that we argue can be used to improve the design of agri-environmental schemes (AESs). Our randomized survey experiment generated three main results regarding the framing of agricultural policy that may improve the success of any new schemes that may be devised in the future. First, farmers are willing to exchange a larger amount of money for reduced application time when it is framed as a reduction in the initial subsidy offered rather than when it is framed as a standard subsidy combined with a separate cost that a farmer must pay. Second, how AESs are named can change how a subsidy payment is allocated across expenditure categories. Specifically, we found that using an environmentally oriented name for a financial incentive scheme may encourage farmers to spend additional income on environmental initiatives, even if no restrictions are placed on expenditure. Finally, changing the framing of an existing scheme can affect the preference relationship between new scheme alternatives. In practice, this means that new schemes should be designed carefully to avoid features that compare unfavorably with existing schemes, because this may adversely affect their attractiveness even if the new scheme provides other benefits. Although the United Kingdom is our case study, our findings illustrate the importance of leveraging insights from behavioral economic theories for agricultural policy redesign more generally

Methods

A sample frame of farm addresses was formed using publicly available data on recipients of CAP subsidy payments in the United Kingdom between 1999 and 2013 from farmsubsidy.org. Invitation letters were mailed to 12,000 sampled addresses. Our survey randomised individuals into a control or experimental condition across three different experiments designed to see if we can leverage insights from behavioural economics, specifically mental accounting and prospect theory, as a low cost means for encouraging participation in agri-environmental initiatives.

Results

First, when exchanging money for reduced application time, farmers are willing to sacrifice substantially more of their subsidy for a time reduction than they are willing to pay in a separate transaction. This suggests that one way of at least partly compensating farmers at least in terms of overall utility (as opposed to money) for reductions in future agricultural support is by integrating any application costs into the subsidy itself, rather than requiring farmers to incur the costs separately.

Second, the label attached to a subsidy appears to affect how farmers would allocate expenditure from additional subsidy income. This result adds to the existing evidence against the fungibility of money. Therefore, a simple and cost-effective nudge to promote more sustainable or environmentally beneficial behaviors would be to rename any basic holding subsidy to include a label that promotes the kinds of expenditure it would be welfare-increasing to encourage. Third, our findings suggest that the relative desirability of any new scheme will depend not only on the characteristics of those new schemes but also on the characteristics of any existing scheme a farmer is currently participating in.

For example, loss aversion may lead farmers to undervalue a new replacement scheme if it contains some features considered to be directly inferior to features of the existing scheme, even if the new scheme offers additional benefits.

Implications

We conducted an online randomized survey experiment on a sample of U.K. farmers to show how two insights from behavioral economics—mental accounting and loss aversion—can inform the design of new agricultural policy schemes to improve uptake (and perhaps effectiveness). Our results show that relatively small changes in the way a policy is framed can potentially have a substantive impact on behavior. These changes have negligible costs compared with the potential benefits they could have. Improving policy design by taking behavioral aspects of choice into account may serve to increase adoption and adherence, encouraging behaviors that boost social welfare. Importantly, better-designed policies could improve the welfare of farmers themselves.

Effect of different price vectors on the preference and willingness to accept (WTA) of farmers to participate in an agri-environmental scheme

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Abstract

Problem and relevance

The specification of attributes and levels in DCEs is difficult and often based on an educated guess or using 'rules of thumb', and therefore, remains largely subjective. Especially the choice of the price vector does not follow a prescribed procedure (Glenk et al., 2019). However, the chosen price vector for the monetary attribute can affect responses to the choice tasks and the estimated marginal utility values. Using a split sample approach with different price vectors can reveal an influence. The effect of different price vectors on the decision-making of respondents have been investigated in few case studies. On the one hand, these studies come to diverging conclusions, ranging from no significant effects of different price vectors (Aravena et al., 2014; Hanley et al., 2005) to strong effects (e.g., Contini et al., 2019; Höhler & Schreiner, 2020; Liesivaara & Myyrä, 2014), hence, not leading to a final consensus. On the other hand, all studies that investigated price vector effects so far are applications in consumer choice and willingness-to-pay (WTP) studies. No knowledge exists yet on the effect of different price vectors in willingness-to-accept (WTA) studies. While in WTP studies, in theory respondents opt-out if prices are too high (choke price), in WTA studies, respondents opt-in, if the payments are high enough. Different mechanisms of anchoring effects might apply and changes in the price vector may affect choice behaviour. Hence, our research question is: Do we find effects of different price vectors on the choice behaviour and WTA estimates? To answer the research question, we test the following three null-hypothesis. H1: There are no differences in the proportion of status quo choices between the different price vectors. H2: There are no differences in the preference for attributes and their levels between the different price vectors. H3: There are no differences in welfare estimates/WTA values between the different price vectors.

Material & Methods

To investigate a possible price vector effect, we conducted a study in the context of agri-environmental policy design. DCEs are widely applied to ex-ante assess the willingness of farmers to participate in agri-environmental and climate schemes (AECS) with different contract designs or land use restrictions (e.g. less fertilizer etc.). We applied a split sample approach with two different price vectors that vary considerably in the price levels offered as compensation for land use restrictions in an AECS targeted at agriculturally used floodplains in Germany. The low price vector ranges from 140 – 1100 €/ha*a, the high price vector from 140 – 1800 €/ha*a. The range was set based on interviews with farmers, already existing AECS, and a literature review containing suggestions on necessary compensation payments in floodplains. About 240 farmers participated in the online survey.

Results

We find that different price vectors offered in the DCE affect farmers' decision-making behaviour. Altering the price vector in the DCE alters 1) the frequency of the opt-out choices, 2) the decision-making strategies of respondents, and 3) the estimations of WTA values. The sample of farmers who saw the high price vector had statistically significant fewer choices for the opt-out alternative (=status-quo -> no contract) than farmers in the low price vector sample, which implies an overall higher willingness to participate in the policy scheme. However, the importance of some attributes for the decision-making changed, i.e. for the high price vector sample the importance of fertilizer restrictions is vanished, while the number of restricted grazing livestock units becomes important. Finally, the WTA estimates (annual compensation payment) are several hundred Euro higher for respondents who faced choice set prices from the high price vector.

Implications

Hence, we find that different price vectors have an influence on respondents' decision-making behaviour in a WTA study. Therefore, when DCEs are used to inform policy makers about possible AECS designs, we suggest to be cautious with the interpretation of study results. The study results, especially the WTA values, could change simply due to different price vectors in the experimental design. We discuss and suggest to always use different price vectors in DCEs aiming at required compensation payments to better identify thresholds of acceptance.

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Session 9



The effect of husbandry system information on consumer willingness to pay for dairy products from cow-calf-contact systems

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Abstract

Introduction

Traditional (conventional and organic) dairy farming systems mainly rely on separating cows from their calves after birth and feeding calves with milk or powder-based replacements. This practice seems inevitable from a pure production economic perspective. However, in light of the immense public debate in the regions of the global North, the EU and also in Germany, our study region, these types of dairy production systems are subject to public concerns about whether early cow-calf separation meets sufficient levels of animal welfare (Busch et al. 2017).

Alternative cow-calf-contact (CCC) systems avoid separating calves from their mothers shortly after birth and offer a more natural development by offering suckling and interaction with a mother cow. But these systems require a re-organization of the farm's respective facilities, creating additional costs, while possible economic benefits from healthier and faster growing calves (Meagher et al. 2019; Waiblinger et al. 2020) are uncertain to the individual farmer. Despite the documented animal welfare benefits of CCC systems, marketing possibilities are limited and CCC systems remain a niche (Placzek et al. 2020).

Consumer studies on the perception of CCC systems have been exploring attitudes towards common practices in traditional dairy husbandry systems (e.g., Placzek et al. 2021; Sirovica et al. 2022). However, it remains unknown, whether the unfavorable attitude towards early cow-calf separation translates into a higher willingness to pay (WTP). We therefore target at closing this gap by comparing the effectiveness of different consumer communication strategies on stated WTP for dairy products from CCC systems.

Based on the theory of theory of consumption values (Sheth et al. 1991; van Riemsdijk et al. 2017) we develop three communication strategies (information treatments). Each of the three information treatments contains information tailored to a specific consumption value—epistemic, social and emotional—and are intended to influence the respective consumption value of the respondents and thereby increase WTP. We investigate the effect of these communication strategies on the relevant consumption values and WTP for dairy products from CCC systems in Germany against a control group that receives neutral information about the production system.

Since enhancing animal friendly production requires large shares of consumers to change their consumption habits, we further examine heterogeneity of responses to the communication strategies by personal values that are relevant in the environmental domain, i.e., altruistic, egoistic, biospheric and hedonistic values (Sivapalan et al. 2021).

Methods

The WTP for dairy products from CCC systems is retrieved using an online contingent valuation (CV) survey. We surveyed 1600 respondents in the beginning of July 2022. Respondents are randomly assigned to one of the four treatment groups: a control group and

three information treatments that are designed to affect the epistemic, social and emotional consumption values, respectively. The control group will receive neutral information about the dairy production system (Figure 1) instead of information tailored to the respective consumption values. The CV scenario briefly presents the CCC system (Figure 1).

Figure 1. Contingent valuation scenario—control treatment

| |
|--|
| Imagine that in your local supermarkets that you regularly visit, dairy products are offered for which the milk is obtained from the following alternative husbandry conditions: |
| Instead of separating the calves from their mothers, the so-called cow-calf-contact husbandry is practiced. In this system, the calves stay together with their mother cows for at least three months. |
| This husbandry system requires investments for adapting stable structures, changes in management, especially more labor input, and more space for the animals. Additionally, around half of the mother cow's milk cannot be sold as long as she feeds the calf. All this increases production costs for farmers. |

The CV scenario is presented after a cheap talk script and the payment vehicle is a payment card. We apply the budget approach as suggested by Nocella et al. (2010). This way respondents can indicate their WTP in terms of a mark-up on their regular spending for dairy products.

Respondents are randomly assigned to one of the four treatment groups: a control group and three information treatments that are designed to affect the epistemic, social and emotional consumption values, respectively. The control group will receive neutral information about the dairy production system (Figure 1) instead of information tailored to the respective consumption values. The items to measure the respective consumption values are based on Sweeney und Soutar (2001) and (Hur et al. 2012). The items for the personal values are based on de Groot und Steg (2008). We use univariate and multivariate analysis to compare the difference in consumption values and WTP across the treatments.

Results

Preliminary results show that 70% of respondents in the control treatment had a non-zero WTP for CCC dairy products. These shares were higher in the emotional and epistemic information treatments (79% and 76%). The differences by 9 and 6 percentage points to the control treatment are statistically significant ($p=0.008$, $p=0.056$ resp., two-sample test of proportions). The mean WTP in the control treatment was equivalent to a 14.5% markup over the expenses for dairy from traditional husbandry. The emotional treatment had the largest effect on this markup and increased it to 18.2% ($p<0.0005$, Two-sample Wilcoxon rank-sum test). We find that personal values were relevant for WTP. For example, higher ratings on the biospheric personal value scale are associated with higher WTP ($p<0.001$, Spearman's rank correlation). In the control group, respondents with low biospheric value (below 4 on a 7-point Likert scale) had a mean mark-up of 9% vs a 16% markup for respondents with high biospheric values (below 4 on a 7-point Likert scale). Biospheric personal values also moderate the effect of the emotional information treatment: For respondents with low biospheric values, the emotional information treatment increased the markup from 9% to 14%, an increase by 51%. For subjects with high biospheric personal value this increase is only 21%.

Discussion

The relatively strong effect of the emotional information treatment on subjects with less ecological orientation may be explained with their relatively low WTP in the control treatment. It seems that to specific non-ecological information, such as the welfare

implications for the animal, can then increase WTP of these respondents relatively strongly, also because of their relatively low WTP in the control treatment. On the other hand, for subjects with a relatively strong ecological orientation, WTP was already quite large and additional information less effective. The comparison of different communication strategies enabled us to identify promising paths to transfer the negative attitude towards early cow-calf separation into willingness to pay price markups for husbandry systems that avoid this practice. The results suggest that animal welfare labels that underline the animal welfare benefits for the animal may be successful in attracting consumers with a low ecological orientation in addition to the already attracted segment of ecological consumers. This is relevant to the dairy value chain, since additional production costs must be covered when adopting CCC systems.

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Sustainable snacks – what do consumers prefer?

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Abstract

Problem and relevance

The vending sector is nested within the food supply chains, and it provides, through vending machines, quick and easy access to different types of food and beverages. Although the revenue of the European market reached the amount of €17 bn in 2019, the entire sector has been heavily affected by the COVID-19 crisis, with significant falls in profits (-30%). This has forced the sector to set up a new business model capable of transforming it for the future. A topic that has recently emerged in the European market is providing more sustainable food.

Vending has always been seen as a junk food provider, and scholars approached it mainly from a nutritional point of view by evaluating consumers' preferences for healthier offers. Although healthfulness is an attribute able to influence individuals' purchase decision, consumers now demand for food products also produced in an environmentally and socially sustainable way. However, sustainability generally involves multiple dimensions, and different consumers express different preferences when facing food products with different sustainable attributes. Moreover, purchase decisions of sustainable food products are also influenced by other factors, as product price.

Nowadays, research papers studying vending sector considering such aspects are still missing, and the present study aims to fill this gap. Designed to be exploratory in nature, it aims to investigate for the first-time consumers' preferences for a sweet snack with sustainable attributes, in particular whether and which product attribute shape more consumers' purchase behaviour. For the purposes of the research, the authors selected a Choice Experiment (CE) as methodology.







Material and methods

A CE has been developed to investigate consumers' preferences for the attributes of a hypothetical sweet snack sold at vending machines. For the purposes of the research, consumers faced with six different scenarios, each containing three alternatives with five attributes, and a "no choice" option (Table 1) (Figure 1) and were asked to choose the alternative they preferred. "Price" attribute refers to the selling price of the snack; "snack rich-in" and "snack free-from" attributes refer to nutritious aspects and involve the presence and absence of healthy and unhealthy compounds, respectively; "certification" attribute refers to the type of sustainable certification hold by the product; finally, "packaging" attribute refers to eco-friendly properties of the material.

Table 1 – Snack attributes and corresponding levels

| Attribute | Levels |
|-----------------|--|
| Snack price | 0.60 €; 0.80 €; 1 € |
| Snack rich in | Protein; fiber; vitamin |
| Snack free from | Fat; added sugars; preservatives and dyes |
| Certification | Organic farming; fair-trade |
| Packaging | 100% recyclable; made with 50% less material |

Figure 1 – Example of a scenario used for the CE

| | SNACK A | SNACK B | SNACK C | D |
|-----------------------------------|--|---|--|--------------------------|
| Sweet snack |  |  |  | |
| Snack price | 0,60 € | 0,80 € | 1 € | |
| Snack rich in | Protein | Fiber | Vitamin | |
| Snack free from | Fat | Added sugars | Preservatives and dyes | No choice |
| Certification | Organic  | Fair trade  | Organic  | |
| Packaging | 100% recyclable | 100% recyclable | Made with 50% less material | |
| Choose the alternative you prefer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Data collection and analysis

A two-parts questionnaire was developed during 2022, and emailed in June 2022 to both undergraduate and master's degree students of a university based in northern Italy. The first part of the survey aimed to collect socio-demographic (e.g. gender, age, field of study). In the second part, students faced the CE scenarios. The CE data were analyzed using Nlogit6© software, relying both on a Random Parameter Logit (RPL) model. Despite the traditional logit, the RPL model relaxes the limitations by offering particular flexibility in order to deal with respondents' differences in choice decision strategies and choice consistency, which would otherwise lead to biased part worth utilities.

Results

General results

In the entire month during which the questionnaire was available online, 333 complete responses were obtained. Respondents were mainly bachelor students (n = 185; 55%), mainly female (n = 211; 65%), more than half aged around 20-24 years (n = 205; 62%).

Results of the choice experiment

From the RPL model emerged that most variables showed a statistically significant heterogeneity of preferences. It seems respondents prefer choosing one of the snacks with sustainable attributes than from choosing the "none of the alternatives" option.

In particular, they perceive a higher utility from choosing one of the snacks with a packaging made with 50% less material, as well as from a snack with fair trade certification. As for nutritional attributes, respondents prefer a snack rich in fibers rather than rich in protein or vitamins. In parallel, they demonstrate indifference to "free from" attributes. Finally, price sensitivity is significant, albeit weak.

Implications

Although our study is exploratory in nature, it contributes to the emerging literature on consumer perceptions about sustainable vending snacks by identifying the drivers of sustainable products consumption. The information generated may be useful both to vending companies and snacks producers for the market. From our results, distinct consumers' characteristics can be established which provide insights on how to target and communicate these consumers to choose more sustainable snacks. Possible solutions to encourage consumers to choose sustainable snacks may include information on packaging and on sustainable certification.

At the moment, the main limitation is sample size, and additional simulations with more data will be performed in the future. Moreover, this study will be followed by a complementary one with the aim of investigating, through a Structural Equation Model, which are the psychological factors able to explain consumers purchase intentions of a snack with sustainable attributes.

The role of framing and priming in shaping demand for safer food choices: Evidence from an experimental auction with four different mutton meat in Afghanistan

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Abstract

Problem and relevance

Meat consumption tends to increase in developing countries due mainly to income growth, urbanization, and an emerging middle class. In developing countries, meat is mostly distributed through traditional butcheries, however, a number of issues prevail in the butchery sector such as higher exposure to food safety hazards due to e.g. poor and unsanitary meat handling practices. In the past two decades, besides traditional butcheries, several supermarkets were established in larger cities in Afghanistan selling fresh products including meat, initially processed at large-scale, modern slaughterhouses. While the new facilities provide safer meat to the public, the consumers' preferences for supermarket meat versus butchery meat is unknown, given the mixed consumer perceptions towards supermarket meat in terms of various intrinsic and extrinsic quality attributes. In addition, in Afghanistan meat is produced mainly by two livestock systems: the sedentary, and the nomadic system. While in the former system, ruminants are reared on high-land pastures, in the later system ruminants graze mostly on low-land pasture, occasionally feed on garbage and food-wastes when roaming inside residential areas. Thus, these ruminants get exposed to higher food-safety hazards.

In light of this background, the objective of this paper is two-fold. First it aims at eliciting consumers' valuation of supermarket versus traditional butchery meat, stemming from the sedentary, and nomadic systems. Second, methodologically this research explores the influence of framing and priming on consumers' attitude towards safer food (meat) choices in a non-hypothetical experimental auctions market.

Material and methods

We utilized the second-price auction mechanism to elicit consumers' willingness-to-pay (WTP) for four different mutton meat: (1) meat stemming from sedentary system, slaughtered at a traditional butchery (MST); (2) meat stemming from nomadic system, slaughtered at a traditional butchery (MNT); (3) meat stemming from sedentary system, slaughtered at a modern slaughterhouse (MSM); and (4) meat stemming from nomadic system, slaughtered at a modern slaughterhouse (MNM). Each product was in identical wrapping and weight (500 gram). The second-price experimental auction is an incentive compatible mechanism in which people use real money to buy real products. The experimental auction was followed by a post-experiment survey.

The research was conducted in Kabul, Afghanistan between Jan – Mar 2021. A total of 230 subjects were recruited using convenient sampling method. In each auction-session, subjects were randomly assigned to one of the three treatment-groups: (a) written information group; (b) visual information group; and (c) priming group. Each session was composed of 21 participants. Auctions were conducted in three rounds, with participants bidding on each product in each round. In round one, all subjects visually examined each auctioning product and then offered their bids. In round two, group one received written information about the two livestock systems (sedentary and nomadic), while group two received visual information about the same. Group three were primed to remember a past experience of meat-borne

disease. In the third round, group one and group two received written and visual information about meat processing systems (butchery meat and supermarket meat) respectively, while group three were primed to recollect an experience of buying meat from a traditional butchery and then getting ill after consumption. The written and visual information were framed positively for sedentary meat, and negatively for nomadic meat in round 2. Likewise, in round 3, the information was framed positively for supermarket meat, but negatively for butchery meat.

Results

Participants were mostly young (97% aged 18 – 35), and educated, with 60% of them being male. Most subjects (57%) perceived traditional butchery meat as unsafe or very unsafe. In contrast, three-fourth of the subjects thought of supermarket meat as safe or very safe. In general, three-quarters of the respondents had low risk perception of getting ill after consuming meat, whereas 62% perceived that the risk of getting ill after consuming nomadic meat slaughtered in traditional butcheries, is high.

Results from round one show that consumers are willing to pay higher prices for sedentary meat compared to nomadic meat. However, the Wilcoxon test result for the aggregated data showed no statistically significant difference between MST and MNT (p-value = 0.07067), and between MSM and MNM (p-value = 0.07396). Result further show higher preferences for supermarket meats. The Wilcoxon test result showed a highly significant difference between MST and MSM (p-value = 0.00163), and between MSN and MSM (p-value = 0.00235) at 1% level of significance.

Impact of Written Information: In round two, the mean WTP for MST increased by AFN 10 – an effect of positively framed information for sedentary meat. For the nomadic meats (MNT & MNM) mean WTP decreased by AFN 7 and AFN 13 respectively – effect of negative information. However, Wilcoxon test does not show any significant difference. In Round 3, the WTP for supermarket meat increased, but decreased for butchery meat. Negative information resulted in higher decrease for traditional-butchery meat (by AFN 29 for MST and AFN 4 for MNT) compared to increase in WTP for supermarket meat (no increase for MSM, but an increase of AFN 11.5 for MNM). Wilcoxon test also shows a significant difference between WTP for MST in round 3 compared to round 2 (p-value = 0.03258). Hence, the impact of negative information is more than the impact of positive information both in round 2 and round 3.

Impact of Visual Information: Visual information in round 2 resulted in higher WTP for sedentary meats (increase by AFN 13 and AFN 1 for MST and MSM, respectively), but lower WTP for nomadic meats (a decrease by AFN 11.4 and AFN 20.5 for MNT and MNM respectively) indicating the effect of negatively framed visual-information more than positive information monetarily. While in round 3, negative information about butchery meat resulted the WTP for MST to decrease by AFN 29, and for MNT by AFN 5.3. While positively framed visual information resulted in a lower increase for supermarket meat. Wilcoxon test also reveals the difference for MST significant at 10% level (p-value=0.1318), but no statistical difference for supermarket meats.

Impact of Priming: In round 2, priming Caused the WTP for traditional-butchery meats to decrease by AFN 7.4 for MST and AFN 10.3 for MNT. However, the WTP only increased for MSM by AFN 4, which might indicate that higher preferences for supermarket meat stemmed from sedentary livestock system. While in round 3 priming caused the WTP to decrease for all meats. However, the decreased amount was higher for MNT (by AFN 8), which may indicate lower preference for traditional-butchery meat stemming from nomadic system.

Implication

A key implication of the study is that there is demand for supermarket meat and consumers tend to pay a premium for it, as they perceive the meat safer compared to butchery meat. Methodologically, both written and visual information, and priming induces more favorable attitude towards safer food (meat) choices. However, results imply that negative message framing has a stronger persuasive power, assuring that negative effect impact outweigh positive effect impact.

Environmental, nutritional, economic and behavioral impact of six environmental labelling systems: experimental evidence

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Abstract

We conducted a framed-field experiment to investigate the impact of environmental label on consumer purchases.

The Food Waste and Circular Economy Act of 2020 (Article 15) and the Climate and Resilience Act of 2021 (Article 2) provide for the design and implementation of an environmental labeling system on food products. Funded by the French Agency for the Environment and Energy Management (ADEME), this study aims to measure the relative impact of various labelling systems on the environmental footprint, nutritional quality, cost and composition of shopping baskets in order to in fine identify the most efficient of them, if any.

Six labeling systems have been designed and tested. All are based on the Nutri-Score nutrition label. Given the specificities of the footprint distribution within and between food categories, the main challenge was to allow discrimination within categories where the differences in impact are least obvious to consumers. Thus, we started from the true environmental equivalent of the Nutri-Score (BASIC) and, based on this, we (i) add numerical information, either with a grade out of 100 (GRADE_100) or with a multiplier factor (GRADE_MULTIPLIER), (ii) disaggregated information about climate, biodiversity and human exposure (BREAKDOWN), and (iii) categorized food by meta-category (CATEGORY). Finally, we also tested the co-display of the environmental label with the Nutri-Score (BASIC+NUTRI).

The protocol follows those used in Muller et al. (2017, 2019, 2020) and Crosetto et al. (2020) where consumers shop for food before and after a policy intervention. Some slight improvements have been made regarding the realism of the task and the strength of the incentives. The experiment now perfectly mimics an online shopping experience and all products in the final shopping basket are actually purchased thanks to a €20 voucher to spend in our experimental online grocery store.

The experimental online store comprises 276 food items divided into four meta-categories: Plant Products; Dairy & Eggs; Meat & Fish; Compound Products & Others. The selection of items was based on two objectives: (i) to be representative of the most consumed foods in France, and (ii) to reflect the diversity for a given food in terms of environmental impact and selling price.

We ran in July and September 2021 seven between-subject treatments of approximately 85 participants each: one for each of the six environmental labelling systems and one benchmark treatment with no label added in the second shopping phase. Between the two shopping phases, participants in the benchmark groups are informed of the purpose of the study (i.e., to test an environmental label) and of their participation in a 'no label' session. In doing so, we ensure that possible demand effects are controlled for.

The primary findings are: (1) All labelling systems significantly decrease the environmental footprint of baskets. (2) The differences in footprint decrease between selected formats are small. (3) All labelling systems significantly decrease the cost per kilogram of purchases

except for CATEGORY. (4) All environmental labels significantly improve the nutritional quality of baskets, except for CATEGORY and GRADE_MULTIPLIER. (5) All labelling systems except the BASIC and BASIC&NUTRI induce significantly more intra-category substitutions.

Session 10



A field study on Forced Active Choices and Default Nudges to reduce meat consumption in cafeterias

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Abstract

Problem and Relevance

Unfortunately, meat is overconsumed in many western countries, causing substantial health and environmental costs including deforestation. These costs are not internalized in food value chains. While there is a need for nutrition policy to mitigate these costs, governments have been reluctant to introduce taxes or regulations on meat value chains, fearing public and economic backlashes. Considering the Nuffield ladder of interventions (Nuffield Council of Bioethics 2007), less invasive policy instruments could be applied to enable people to eat less meat, particularly a change of defaults in choice environments (Nuffield Council of Bioethics 2007), typically considered nudges. Surveys on public opinion find a higher degree of acceptance for nudging interventions than for taxes or stricter regulations (D. Lemken et al. 2018). Previous Field studies have applied defaults to nudge people towards meat free meals or reduced portion sizes (Meier et al. 2022). In principle, defaults have been reviewed and are capable of breaking habits and changing meat consumption amounts (Meier et al. 2022). Reduced portion sizes are typically more accepted than vegetarian dishes among general consumers, particularly among heavy meat eaters, which can contribute the most to reducing societies' meat consumption levels (Dominic Lemken 2021b).

For reduced portion size defaults, only two studies can be identified (Vandenbroele et al. 2018; Reinders et al. 2020). There remain several open questions. Firstly, the effect size of a defaults depends on maintaining the attractiveness of the reformulated default dish (Reinders et al. 2020). Several cafeterias would find it simpler to plainly change meat portion sizes, which reduces the adaptation costs for cafeterias and might be generalizable across different cafeteria scenarios but still represents a form of reformulation to be accepted or rejected by customers. The effectiveness of such a low-cost change is not tested in the Field. Secondly, defaults are the most contested nudges, not only in the policy arena (Bovens 2009; Smith, Goldstein, and Johnson 2013). Depending on the default design, many valid reservations apply (Dominic Lemken 2021a). Cafeteria managers need to secure a high satisfaction of their customers and have to avoid misleading them against their interest. Here, a forced active choice might also be equipped to break meat eating habits causing hardly ethical concerns (Dominic Lemken 2021a), but not yet analyzed for reduced meat portions or compared to defaults concerning effectiveness and customer satisfaction.

Materials and Methods

We will investigate lunch choices in a health clinic's cafeteria. The cafeteria offers a menu 1: a vegetarian dish, and menu 2: a meat dish. A salad bar is also available. Patient do not need to pay for each lunch option. They simply walk up to the counter and voice their choice and are served by chefs. The menus are visible in front of the lunch room on a glass-board and are explained by the chefs. About 100 meals are given out each day (Monday to Sunday). Patient stay on average 3 weeks with little variance due to the physical disease treatments at the clinic. Given how the main knowledge need is with reduced portion sizes, the intervention is not targeted at the vegetarian dish but

introduces a meat option with substantially reduced meat portions. In general, patients are aware that they are free to adjust the portion size of any meal component or refill plates but often stick to default plates. We also inform about adjustable portion sizes on the glass-board in front of the lunch room. In all phases, our team manually (2 persons at a time) collects patient's choices and context information, while being disguised as kitchen chefs behind the counter. The offered meals change each day and are repeated after 6 weeks, which will be the time frame for this study's intervention. Three Study phases are introduced:

1. Control: The status quo is recorded on 3 to 4 days per week. We exclude a Veggie Wednesday, Fish days and meat dishes such as soups and alike. After the first six weeks, an incentive-based survey will be conducted among the patients. The survey will evaluate customer satisfaction, the CAN approach to measure perceived-convenience, -attractiveness, - and normality of the menus (Wansink 2015), a recall of patient's lunch choices and patient's lunch routines at the clinic and patient's socio-demographics. In the following there will be a 6 week break in collecting data to account for seasonal biases such as Christmas.

2. Treatment forced active choice: In the forced active choice, the glass-board and the chefs inform patients that they have to choose between small and large meat portions if they choose the meat menu. Patient cannot avoid this decision. For example, for a ragout the small portion is served with a 60g sauce scoop, while the large portion is served with 100g scoop. A purely descriptive nudge is added to all intervention phases to point out the environmental advantage of smaller meat portions based on standardized Nahgast calculations (Speck et al. 2020). The descriptive nudge is displayed on the glass board and on a DIN A4 wallpaper. Default Nudges often include such a descriptive nudge to maximize effectiveness (Dominic Lemken 2021a), as the descriptive nudges come at very low additional costs although making it impossible to untangle the nudge and default effect. The intervention phase is followed by a survey mimicking the first survey but adding measures on the perception of the intervention during the last weeks

3. Treatment Default Nudge: During this period, the small scoop (60g) or half a piece of meat is issued as the standard meat menu. The glass-board and the wallpaper are adjusted accordingly. The chefs at the counter are required to serve the small portion, but to adjust any portion size on demand, remains a normal procedure. Other features remain as under the treatment 2 condition. Following the final phase, there will also be a final survey in the same fashion as before.

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The optimal design of contracts aimed at reducing methane emissions from dairy production

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Abstract

Mitigation of GHG emissions resulting from agricultural production is an important part of the debate on climate change. Cattle production is considered the main agricultural activity contributing to methane emission. It refers to nearly half of GHG emissions from the farming sector [NIR 2021].

Inspired by the results of the CONSOLE Horizon 2020 project³, which focuses on analyzing various types of contracts for producing public goods by farmers through agri-environmental-climate measures (AECM) we attempted to model specific measures that have the potential of mitigating methane emission from dairy farms. Each Member State of the EU is obliged to design AECM schemes to maximize the environmental impacts of the CAP. However, the programme's overall effect depends on the environmental efficiency of proposed measures and the share of farmers willing to participate.

The measures discussed in the paper are not on the officially offered to farmers list of the AECM schemes. However, based on the modelling results, we will present to the Ministry of Agriculture in Poland a suggestion to include the designed actions reducing methane emissions considered in our study:

(1) dietary supplementation [van Zijderveld et al. 2011], (2) Vaccination against Archaea [Black et al. 2021], (3) Biofiltration [Melse, Van der Werf 2004].

The approach applied in the study combines the assessment of farmers' acceptance of methane mitigation instruments (Willingness to Accept – WTA) and the optimization procedure aiming to find the measure's most environmentally efficient structure at the given budget. To investigate farmers' WTA, we designed and implemented a stated preference survey using the Discrete Choice Experiment (DCE), in which the following attributes have been included: measure to be applied, duration of the contract (1,5,10 years), remuneration for the effects (result based or action based), and the payment rate. Payment per ton of mitigated emission was set at 80,120 and 200 EUR/tonne of CO₂ equivalent (CO₂e). The rates of payments in the DCE were recalculated per cow for each type of measure.

These attributes were considered the most relevant (often classified as significant in the literature) and situationally representative (representing actual contractual characteristics at the time of the study).

The plan of the experiment was prepared with the following assumptions: each choice set includes three alternatives (2 potential designs of ACEM and a "no choice" option). The initial plan included 54 ACEM designs (all possible combinations of attributes levels). The reduction of profiles number was made by DB-error minimizing method. Applied coordinate exchange algorithm (CEA) implemented in the idfix package (R CRAN) to prepare 36 choice sets. Each respondent answers 9 choice sets selected randomly out of 36.

³ CONSOLE - CONTRACT Solutions for Effective and lasting delivery of agri-environmental-climate public goods by EU agriculture and forestry; Research and Innovation action: H2020 - GA 817949

The experiment was run in 5 regions (NUTS 2) of Poland with the highest share in the total country's milk production. The field of observation was limited to farms keeping more than 20 cows. In total, about 450 farmers took part in the experiment.

To model farmers' preferences using discrete choice experiment data, we assumed that utilities derived by farmers could be described by the random utility model (RUM):

$$U_{ijk} = \eta_{ijk} + \varepsilon_{ijk}; i = 1, \dots, N; j = 1, \dots, A; k = 1, \dots, S \quad (1)$$

where N - number of farmers, A – number of alternatives, S – number of AECM designs. The first term of equation (1) η_{ijk} represents systematic part of utility derived by i -th farmer from j -th alternative in case of k -th AECM design. The second term ε_{ijk} represent stochastic disturbance.

As a result of DCE only choice of alternative y_{ik} by the respondent is observed, not the utility he derives from this alternative. Nevertheless, it is assumed that the respondent chooses the alternative with the highest utility. Consequently, the probability of choosing j -th alternative is:

$$P(y_{ik} = j) = P(U_{ijk} > U_{igk}), \forall g \neq j \quad (2)$$

Assuming that disturbance terms ε_{ijk} have standard Type I extreme value distributions and are independent and identically distributed. Equation (2) takes typical form from the multinomial logit model (MNL):

$$P(y_{ik} = j) = \frac{\exp(\eta_{ijk})}{\sum_{g=1}^A \exp(\eta_{igk})} \quad (3)$$

A combination of the typical MNL model, which explains the expected utility η_{ijk} by a linear function of respondent characteristics with the conditional logit model proposed by McFadden (1973), which uses attributes of alternatives was applied:

$$\eta_{ijk} = \mathbf{x}'_i \boldsymbol{\beta}_j + \mathbf{z}'_{ijk} \boldsymbol{\gamma} \quad (4)$$

where vector \mathbf{x}_i stands for respondent characteristics invariable across alternatives (i.e. number of cows at the farm) and vector \mathbf{z}_{ijk} represents characteristics which vary across alternatives (AECM design).

Using the estimated MNL model, probabilities of choosing a specific AECM design were calculated for each farmer in the sample. Then, for each set of payment rates for the designed AECM, the most probable AECM design (with the highest utility) was selected for each of the farmers, allowing to construct disjoint sets of farmers choosing specific AECM designs in case of considered payment rate.

The optimization procedure was aimed at selecting the set of the most efficient structure of AECM designs. For this purpose, the mixed integer programming model was designed. The model aimed to maximize the environmental effects of applied AECM designs under given budgetary constraints. To reveal the whole range of AECM designs to be applied, the optimization procedure was iterated for several levels of budgetary constraints starting from 0 to the maximum justified budget, maximizing environmental effects.

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Service-based adoption using agricultural digital technology: An Experimental Evidence in Nigeria

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Abstract

Problem and relevance

The rice sector in sub-Saharan Africa (SSA) is facing important constraints that need to be addressed to ensure sustainable economic development of the sector. Although progress has been made, especially in terms of increasing production volumes, rice consumption has also increased. Rice consumption has become important for food security in many countries, including Nigeria. The sustainable economic development of the rice sector in sub-Saharan Africa (SSA) required technological solutions, such as digitized extension services. However, even if the user is willing to use the digitized extension service, the low e-literacy, lack of Information Technology infrastructure, and lack of know-how are factors that limit the direct adoption of the technology.

Objective

This study proposes an indirect adoption approach by using a service-based and aims to seek appropriate payment methods for the sustainable development and adoption of the proposed services and finally evaluate the impact of the adoption on food security and the profitability of rice production.

Material & methods

Data collection and experimental design: The study will be carried out in Jigawa State. It is located in the northwestern part of the country and covers 27 Local Government Areas (LGA). We used a multistage stratified approach to identify the LGA, villages, and the household to be surveyed based on the list provided by the rice partner. We randomly selected the villages and randomly assigned each village a service-based profile.

In the frame of this study, we use the RiceAdvise App design by AfricaRice, to provide a tailor-made recommendation to a rice farmer. We designed three service-based profiles based on a previous study on the adoption of the technology, its impact on rice yield, and information collected from rice actors. The service-based profile is a package of services based on payment

methods, and prices proposed to rice farmers. In total, 360 rice farmers were selected per each service-based profile and the control group. We have a total of 1440 rice farmers. The data collection was organized in two-phase.

- First was the baseline data collection,
- The intervention in two steps: Step 1: proposing the assigned service-based profile to the assigned rice farmers and collecting their willingness to adopt and pay according to the payment method; Step 2: Providing the service to those who said YES.
- Second, we collected follow-up data for the dry and rainy seasons.

Several approaches are used to assess the impact of an innovation or technology. In the case of this study, a Randomized Control Trial (RCT) approach was used to assess the impact of the adoption of the service-based profiles (SBP) as follows:

SBP1: Contract farming with miller + private digitized extension service with the option to pay at harvest period.

SBP2: Contract farming with miller + private digitized extension service with the option to include the service's cost into the paddy's selling price at harvest.

SBP3: Contract farming with miller + private digitized extension service with cash payment option; and

Control: Contract farming with miller

Statistical methods and models

The objective here are first to identify rice farmers who are willing to use and pay for the proposed service assigned to them, and second, among those who have accepted to use it, to identify those who have truly participated or adopted. Adoption here is validated by a loyal payment according to the service-based profile. This leads us to two outcomes, the first one is the willingness to use the service, and the second one is whether those who have accepted the usage really adopt it. The second outcome is very important for us as it helps to determine the adoption rate. Since we have two binary outcomes, we will use the probit model with sample selection similar to that of Heckman (1979). The model was introduced by Van de Ven and Van Pragg (1981) and consisted of probit and selection equations.

For data analysis, a single mean difference would give us the required impact. However, since we have both baseline and end-line information, we will use three different approaches to estimate the effect of treatment: a simple OLS model to estimate the Intention to Treat (ITT) effect; the covariance analysis (ANCOVA) to estimate the treatment effect and Local Average Treatment Effect (LATE) to estimate the impact of rice farmers who adopted and use the business model along during the study.

Partial results from Baseline

In this section, we present the results from the baseline data collection. The impact analysis will be conducted after the follow-up data collection.

Table 1 Assessment of the business model based on the perception

| Business Models | How would this business/service benefit you? | Indicators | | | | Average | |
|-----------------|--|---|--|---|--|-------------|------|
| | | Willing to use the new business model at a reasonable fee | Willing to pay the price and make an effort required by the new business model | Size of the rice farmers that would be interested in this | How our proposed service is different? | | |
| BM 1* | - payment after harvest - Cost of service: 1500 Naira /1/4 hectare - Contract farming | 3.54 (0.97) | 3.59 (0.97) | 3.62 (0.88) | 3.68 (0.95) | 3.19 (0.97) | 3.52 |
| BM 2* | - Payment after harvest and incorporated into the rice price - Cost of service: 3 Naira per 2Kg - Contract farming | 3.42 (0.94) | 3.47 (0.94) | 3.56 (0.89) | 3.65 (0.80) | 3.20 (0.81) | 3.46 |
| BM 3* | - Cash payment at delivery - Cost of service: 1000 Naira/1/4 hectare - Contract farming | 3.43 (0.84) | 3.32 (0.93) | 3.50 (0.76) | 3.60 (0.75) | 3.35 (0.84) | 3.44 |

Table 2 Intervention outcomes

Table 2.1 Decision of farmers

| VILLAGE | Accepted | Refused | No answer | Total |
|---------|----------|---------|-----------|-------|
| Total | 267 | 52 | 40 | 360 |
| % | 74.16 | 14.44 | 11.11 | 100 |

Table 2.2 Decision of farmer per Business model

| VILLAGE | Accepted | | | Refused | | | No answer | |
|---------|----------|-----|-------|---------|------|------|-----------|------|
| | BM1 | BM2 | BM3 | BM1 | BM2 | BM3 | BM2 | BM3 |
| TOTAL | 77 | 126 | 64 | 3 | 14 | 35 | 20 | 20 |
| % | 21.38 | 35 | 17.77 | 0.8 | 3.88 | 9.72 | 5.55 | 5.55 |

A Global & Analytical Willingness-to-Pay Elicitation Method - The case of the Corporate Social Responsibility attribute for wine

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Abstract

Problem and relevance

This paper develops a willingness-to-pay (WTP) elicitation method that combines the strengths of choice experiments and experimental auctions. While these tools are standard for estimating consumer values of goods and their attributes, they tend to produce dissimilar results since their methodological discrepancies may trigger distinct types of behavior.

Sources of difference include (i) the dichotomy between revealed and stated preference elicitation, (ii) the use of a latent construct in the choice experiments (i.e. random utility theory), (iii) the nature of the task (picking vs. bidding), and (iv) the difference in framing in the two types of experiments and in particular the number of attributes presented. Furthermore, these difficulties of the value elicitation methods in generating systematic WTP are inextricably linked to behavioural inconsistencies. In particular, consumers may not have well-formed preferences (Plott 1996) and use distinct cognitive processes depending on the situation they are making the decision in (Kahneman, 2011).

There are many lessons to be drawn from the methodological and behavioural literature. We have essentially retained the following five points for an improved preference elicitation method. (i) Values should derive from revealed rather than stated preferences. (ii) Value estimates must not be based on behavioural assumptions or stochastic models. (iii) Evaluation procedures should minimise anchoring and information effects by not emphasising the attribute(s) under consideration. (iv) The elicitation task should promote thoughtful evaluations among respondents and (v) promote the relative evaluation of attributes.

Material and methods

The G&A method combines two experimental auctions and a conjoint analysis. Practically, the G&A method is a three-step method which proceeds as follows. First of all, consumers are invited to bid on different versions of the same good according to the standard rules of the BDM mechanism. To do so, they are informed of all the attributes that define each alternative and then value each alternative as a whole. This first measure is what we simply call the global WTP. Second, respondents undergo a conjoint analysis procedure that consists in evaluating the desirability and the importance of each attribute (following the calibrated auction-conjoint method of Norwood and Lusk 2011). In doing so, they implicitly value each attribute by iteratively adjusting their relative weight. The theoretical WTP for each alternative is calculated by summing all attribute values. These theoretical WTP are purely informative as they are not used as bids; The aim of this phase is to force respondents to reflect on the relative importance they really attach to each attribute. In a third phase, respondents have the opportunity to revise their initial offer (based on the overall assessments) in the light of what they have experienced from the self-calibration process. We call this second set of values the analytical WTP. Once the three phases have been completed, either the global or analytical WTP is drawn at random to constitute the bids for the actual sale through the BDM mechanism.

We apply the method to obtain the willingness to pay of four bottles of wine that we call according to their respective production processes: *CSR*, *CSR+Organic*, *Organic* and *Conventional*. The attributes were grouped into three categories that are easier to manipulate. First, the Product Attributes describe the content of the wine (pesticides, sulphite, alcohol, energy). This category mainly includes attributes that have an impact on the health of consumers. Second, the Production Attributes comprise all the non-embedded attributes, i.e. those relating to environment, employees, local life and ethics (e.g. transparency of practices, fight against corruption, and criteria for selecting trading partner). Product and Production categories determine farms adequacy with CSR practices. Finally, the Hedonic attributes are determined individually through tasting.

Participants were recruited in the Bordeaux region by phone by a company specialized in consumer studies. To be selected, participants had to consume red wine at least three times a year and purchase an average of at least two bottles of wine per month. Wine professionals were excluded from the study. 10 sessions of just under 2 hours were conducted in February 2019 for a total of 163 participants. Participants were each paid €30 (about \$33.30) by cheque at the end of the sessions as compensation for time spent in the laboratory.

Results

Sensory properties are the main driver of value. Sensory properties are by far the most important determinant in the purchase of a wine. Hedonic attributes account for almost 60% of the total adjusted theoretical value of wine, compared to about 20% for both Product and Production attributes. CSR was the most appreciated wine at the tasting. It was also the most valued in both auctions. On the contrary, Organic was the least appreciated, which was also reflected in the bids.

More interestingly, analytical pondering lowers willingness-to-pays. The average WTP of the four wines significantly decreases from €3.80 to €3.45 between the first and last stage. However, the decrease between Global and Analytical WTP does not affect all wines equally. While the values for CSR, Conventional and Organic decrease respectively by 8.4%, 11.8% and 15.4%, the average decrease for CSR+Organic is less than 3% and statistically non-significant. The WTP decrease is moderated by the presence of sulphites and pesticides. It is the desirability and importance towards the Product Attributes that drive the evolution of WTP.

Implications

Our results confirm that the choice of the elicitation method matters. Bids drop after participants are asked to weight the attributes in the conjoint evaluation phase. However, goods that better match consumers' expectations are more protected from this decline. Applying this method to wine, we find that the value, mainly driven by tasting, decreases for all wines after the attributes are weighted, except for the one with low sulphite and pesticide content. The presence of sulphites and pesticides were disregarded at first bids and then more considered after careful pondering.

Poster session



Farmers' network biases: The research agenda in frames of behavioural economics

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Abstract

Problem and relevance

Challenges of globalisation and sustainable development impose new responsibilities on agriculture. Farming no longer consists solely of producing and selling agricultural raw materials. It must also account for preserving natural resources and climate and reducing greenhouse gases (EC 2009). Meeting the new obligations incurs additional costs. While the benefits of additional activities often remain deferred. Furthermore, individual farmers are not feasible to bear investment costs with zero returns. Therefore, the new challenges require network coordination (Mènard, Klein 2004).

Network coordination as an economic phenomenon is a relatively new area studied in economics, particularly in agricultural economics (Mènard 2000). Networking enhances profits through optimizing supplies and procurement (Lazzarini et al. 2001). The literature emphasises that the network primarily determines the innovation potential (Abdirahman et al., 2014a; Kühne et al., 2007). It could also strengthen social and environmental responsibility (Murdoch 2000; Jarosz 2000, Abdirahman et al. 2014). Networks facilitate the implementation of a new circular economy and bio-business solutions (Nuhoff-Isakhanyan et al., 2016).

Explicit defining of a network is not attainable because of the diversity of its formal or informal forms in practice. Networks continually, non-linearly and spontaneously evolve and are characterised by the polymorphic nature of the networking parties (Håkansson et al., 2009). The network aim defines actors' helixes. We may assume that network is a proactive and voluntary community formed by several parties for mutual benefits. Network partners (nodes, actors) create network relationships (links, ties) to trigger the network activity (flow, exchange). It may also be defined as a web of complementary, compatible, coevolution activities, resources and actors (Håkansson, Snehota 1995).

Networking is a way to realize an effective long-term strategy (Håkansson, Snehota 2006). Different theoretical approaches demonstrated network activity's rationality and economic effectiveness (Wiśniewska-Paluszak 2018). From the industrial organization perspective, networks enhance the effectiveness of the industry (Billand, Bravard 2004). In the resource-based lens, the network relationship is a valuable resource and competence which determines relational rents and sustains the competitive advantage (Dyer, Singh 1998). The theory of games and economic behaviour informs about the domination of cooperation trade-offs and win-win-win solutions in networks (Borczech, Czakon 2005). From the institutional perspective, a network is an effective form of economic coordination (Powell 1990).

Network formation or entry is considered an independent and rational decision of network partners. The network formation, maintenance, and resolution require partners' active and voluntary interaction. This study aims to extend up-to-date farm network studies by deploying behavioural economics factors to investigate the farmers networking biases. We undertook the following steps to achieve this aim:

- Revisioning of up-to-date models and approaches employed in farm network studies;
- Conducting a pilot study of farmers' network activity;

- Suggesting behavioural variables that could explain and reduce the network intention-behaviour gap.

Social pressures on farming to meet the new challenges of globalisation and sustainable development will gradually eliminate non-networking farming players from the market. If they fail to adapt to new demands, their production and capital value will promptly decline. Farmers with mutual aims should be convinced and motivated to achieve them via networking.

Material and methods

Firstly, we revised farm network models and approaches. The words ‘farm’ and ‘network’ were searched simultaneously. Web of Science, Scopus and EconLit bases were used for searching. The reviewed papers come primarily from the Journal of Chain and Network Science and the International Journal on Food System Dynamics. Then, a pilot study of 95 fruit and vegetable farmers was carried out in Poland. Horticulture is regarded as perishable production and networking sector. Purposive sampling was used to select the probe. Based on the population’s characteristics and the study’s objective, we aimed to achieve high representativeness of various types of production and farm locations. Farmers self-reported networks by questionnaire with 12 identifying and eight evaluating questions with a 5-level Likert scale. The theoretical review and empirical exploration set the basis for elaborating a research agenda proposition in the frames of behavioural economics. We suggested variables that could explain farmers’ network biases.

Results

The literature shows the importance of different institutional and behavioural factors in farm networking. Institutional economics explains farmers’ networking factors like relational, asset and location specificity (Pasucci 2011). The activity-resource-actor approach confirmed stronger operational relationships than partner relationships (Wiśniewska-Paluszak, Paluszak 2019). Resource-based theories show weakness in relational investments (Wiśniewska-Paluszak, Paluszak 2021). Social capital perspectives show the weaknesses in information and knowledge exchange (Avetisyan, Ross 2022). The planned behaviour theory (PBT) applications suggest that attitudes, subjective norms and perceived behavioural controls explain high variance in network intention and behaviour (Kühne et al. 2013, May 2012, Menozzi et al. 2015, Möllersa 2018, Bäuml 2022).

The empirical exploration shows that farmers network primarily under formal contracts concluded mainly with contractors with whom they had a previous positive experience and who offered favourable pricing and payment terms. The network seems primarily concerned with operational transactions and serves to optimize supplies and procurement. A few investigated farmers declared that they raise funds for development with their counterparts. For day-to-day network operations, farmers share information and knowledge. Another important activity is a mutual adaptation to changes, i.e. mainly adaptation of quality standards.

According to our study, relationship formation and maintenance are based on trust, reciprocity, commitment and excellent reputation. Most investigated farmers believe that common norms and balanced network power control are essential to maintaining the network. Expanding networking is possible within sustainable and long-term relationships. The surveyed farmers prefer to network with long-term partners rather than newly met ones. Farmers do not network or even know contractors or competitors of their immediate contractors. They also indicated a small number of contractors with whom they network. Thus, the surveyed farmers formed neither broad (horizontal) nor deep (vertical) networks, and their ties were limited to their most essential and well-acquainted counterparties, i.e.

supplier(s) and buyer(s). They also did not form extensive networks with institutional entities or those outside their immediate environment. While cooperating on an ongoing basis in operational scopes with their counterparties, they did little or no cooperation in research and development, innovation, sustainable development or building community ties.

Implications

This study shows crucial farmers' network biases that may limit networking in the most challenging areas, i.e. research and development, innovation and social responsibility. Specific attitudes and emotions are fundamental in entering or formatting networks. They are related to the following network preferences of studied farmers:

- Maintaining relationships with the immediate partners;
- Interacting for current adaptations to market pressures;
- Activating in optimisation of operational activities.

Our study suggests that attitudes, motivations, and expectations of current and future network rewards make the basis for farmers' decisions on:

- Which interactions to undertake in networks? (network activities)
- Which resources involve in networks? (network resources)
- With whom to network? (network actors)

Decision-making biases due to emotions could be developed in the farmers' networking intention and behaviour model. Four suggested behavioural variables could explain and reduce the network intention-behaviour gap:

- Preference for short-term over long-term rewards,
- Adapting through quality standards over innovative changes,
- Confidence in network partners and no confidence in new actors,
- Unwillingness to share resources.

Farmers are increasingly aware that they will not individually handle all imposed social and environmental responsibilities. Many already got the message about the benefits of networking. However, most are biased against entering networks. They network to a limited extent solely with their immediate suppliers or buyers. A better understanding of behavioural factors of farmers' networking could help form desired network activities and economic incentives.

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A discrete choice experiment on consumers' willingness to pay for omega-3-enriched eggs in Croatia

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Abstract

The latest trends in the food market indicate a growing demand for functional food products with added health and nutritional benefits, such as omega-3-enriched eggs. Omega-3 eggs are higher in concentration of unsaturated fatty acids, vitamin D, vitamin E and other beneficial nutritional contents. Regarding health benefits, omega-3 enriched eggs can help to reduce the risk of cardiovascular disease and maintaining normal blood cholesterol levels. Although the demand is growing, consumers are often not willing to pay more for “nutritionally enriched” eggs. Understanding the underlying reasons for low adoption is an understudied research area.

To evaluate the market position of enriched eggs, the main aim of the research is to examine consumer demand for omega-3-enriched eggs. We also investigate consumers' knowledge about and attitudes towards omega-3-enriched eggs. We use a discrete choice experiment to estimate willingness to pay (WTP) for eggs with different attributes.

Empirical data will be collected in a pre-test, using an online survey among 200 Croatian consumers who are responsible for their household's food purchases. We will estimate multinomial logit models to derive basic willingness to pay values for production type and health enhancement properties of a typical egg package. To explore preference heterogeneity, we will also estimate random parameters logit models. In addition, if a sufficiently large sample is available, we will explore how health attitudes affect consumer choices in a hybrid choice model which is theoretically informed by a Health Belief Model (cf. Green et al., 2020). Our results are useful to identify consumer segments, to evaluate market potential, and to understand the links between health beliefs and food choices.

Key words: choice modelling, agri-food marketing, health belief model, consumer psychology

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Notes

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Purchasing behavior in the case of a hungarian geographical indication product

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Abstract

Almost every country has its own national drink, which is culturally, socially, and economically decisive. What was whiskey in the former British Empire, tequila in Mexico, cognac in France, or grappa in Italy, in Hungary, it is undoubtedly pálinka. Pálinka is the national spirit of Hungary and is in possession of the geographical indication of the European Union. But from the 1990s until the turn of the millennium, the drink was regarded as an extremely low-quality spirit. The turnaround in this field began in the early 2000s thanks to the creation of an appropriate legal environment, strengthening campaigns of Hungarian governments (e.g., marketing campaigns), the establishment of the Pálinka National Council (PNC), and the acquisition of the protected and privileged status of the drinks. The main goal of this research is to examine Hungarian pálinka consumers and their behaviour in the context of a discrete choice experiment, involving ethnocentrism. So far, no one in Hungary has carried out a discrete choice experiment to examine the pálinka sector, and the experience on the international scene is that such analyzes are not really typical of the pálinka's direct competitors (mainly whiskey and vodka). The importance of the topic is justified by the fact that Hungary has placed great emphasis on improving the image of pálinka, as a Hungarian national drink, and that the budget receives significant revenue from the excise tax of pálinka.

During our research, the data collection of the online questionnaire was carried out by a professional market research company (InnoFood Marketing Ltd.). The data collection took place between April and July 2021. Due to restrictions related to COVID-19, data collection was done online only using the research software of Qualtrics. The questionnaire was aimed at analysing the behaviour related to the purchase and consumption of pálinka and assessing the respondents' proficiency in the topic, with a special focus on collecting the sociodemographic characteristics of the respondents. To establish the questionnaire, we prepared a wide-ranging literature review and expert interviews in advance. Subsequently, a pilot survey (n=73) was conducted, based on which the questions were finalized. From the data of the final survey of 1,000 Hungarian people, representative for the Hungarian alcohol consumer population, 760 responses were evaluated after data cleansing (e.g., exclusion of incomplete or incorrectly completed questionnaires). Discrete choice experiment (DCE) used to investigate our research goal. This method is a stated preference (SP) procedure, so it examines the choices of individuals in a hypothetical context. The method is based on the theory of random utility (RUT), hence it assumes that a latent construct (utility) exists in the mind of the decision-makers for each alternative of the decision set to be analysed. During our hybrid modeling, we wanted to examine a latent variable (ethnocentrism), which we approximated through 17 indicator/evaluative statements (likert scale ranging from 1 to 5) (Shimp and Sharma, 1987).

The presence of the investigated product characteristics (Bestillo brand, Gönci geographical indication, Kisüsti production method) all have a positive effect on consumer preferences. At the same time when price increases, the consumer's sense of usefulness for the product decreases. It can also be seen that, by including latent variable (ethnocentrism), we managed to estimate a model showing a better fit. The level of ethnocentrism is significantly higher among respondents over 60 than among younger respondents. In addition, the level of ethnocentrism among respondents with a higher education and those who live in a big city

is already weaker than among respondents with a lower education or those who do not live in a big city. From the WTP estimates, it can be concluded that there is a willingness to pay between EUR 18,52 and EUR 20,12 for the Bestillo brand, and respondents would pay between EUR 6,92 and EUR 8,19 more for Kisüsti production. The highest willingness to pay is shown in the direction of the Gönci brand and amounts to approximately EUR 24,26–24,58.

Even though there was a turning point (e.g., legislative changes) in the life of pálinka in Hungary, the knowledge of Hungarian and European consumers about pálinka can still be considered low. Increasing sales and awareness, from both the government and corporate side, is an important task, in which the discrete choice model can help. It is clear from the research that there is a demand for quality pálinka because the presence of both the brand and the quality label (geographical indication) carries added value for consumers and they are willing to pay more for it. Based on the presented results, the pálinka distilleries and the companies selling the spirit can even better understand how important certain product attributes (e.g., production method, price) are considered by the consumers. However, the results cannot be considered representative of the entire Hungarian population (e.g., the limitations of online research), we conducted our survey among consumers interested in pálinka.

Addressing regional agri-environmental problems by integrating social-behavioural components in bio-economic modelling

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Abstract

The sustainable transition in agricultural production systems can benefit from shifting the focus from the individual farm level to a collective scale (e.g., regional or landscape) (Kuhfuss et al., 2019). Achieving high environmental performance requires coordination between farmers due to ecological processes' spatial correlation and the public-good nature of ecosystem services (Zavalloni et al., 2019). Biodiversity loss is one of the systemic agri-environmental problems that can benefit from such a shift (Gonthier et al., 2014). In Europe, intensive agricultural systems significantly contribute to biodiversity loss, and conflicts between productive and conservation goals might worsen in the future (Lecuyer et al., 2021). Acknowledging farmers' social-behavioural patterns is critical to achieving a regional analytical and policy approach that accounts for farmers' interactions and can better tackle such systemic problems. Designing spatial coordination incentives and leveraging farmers' social-behavioural patterns to nudge sustainable behaviours (Nguyen et al., 2022) are two concrete applications of this approach.

Although experimental and behavioural economics (EBE) has highlighted behavioural patterns that depart from neo-classical economic theory and include social-behavioural components (Farrow et al., 2017), agricultural systems models struggle to integrate them (Reidsma et al., 2018, Huber et al., 2018). Bio-economic models (BEMs), in particular, describe systems of independent self-interested individuals far from existing socially interconnected agricultural systems. Although these models are essential to quantitatively evaluate technology and policies at the farm level, poor social-behavioural realism limits BEMs' ability to solve regional systemic issues like biodiversity conservation, and can lead to unrealistic solutions. The following study has two main objectives. First, to identify the main social-behavioural components of agricultural decision-making that can be integrated into BEMs. Second, we illustrate how this integration improves BEMs' ability to plan biodiversity conservation. To do so, a proof-of-concept social-bio-economic model (SBEM) is presented where socially interconnected farmers make land-use decisions compromising economic and social objectives. The research contributes to bridging EBE literature to agricultural system modelling, providing both sides with valuable coordinating insights.

With the help of a semi-systematic literature review, social-behavioural components are selected based on four criteria: previous implementation in agricultural systems models, ease of mathematical formulation, data requirements, and scalability. Then, we set up an illustrative regional SBEM driven by synthetic data, where farmers' objectives include profit and social norms about adopting biodiversity-enhancing practices. We build on le Coent et al. (2021) to include injunctive and descriptive social norms in a more realistic farm decision-making context. In particular, norms are linked to land-use decisions and target a continuous variable (i.e., percentage of land under conservation practice). Then, we add the complexity of social networks, where social ties between farmers affect how social norms are perceived by each of them. Our SBEM can be used to optimise regional agricultural planning and design solutions to different sustainability issues that consider social relationships between

individual decision makers. The illustrative exercise on bio-diversity conservation is used to convey our contribution. Although simple, the model shows how including social-behavioural components can improve the representation of regional agri-environmental processes and support regional planning of biodiversity conservation. Depending on the social setting, the model highlights how it is possible to reach similar conservation results with less overall policy cost than traditional individual financial incentives (e.g., by promoting adoption around specific nodes of the social network). However, data is required to give it empirical validity, and modellers should work closer to experimental and behavioural economists to agree on necessary behavioural data collection standards.

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The impact of interventions on changing children's attitudes and behavior toward food choice

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Abstract

Problem and relevance

According to the WHO (2018) and the OECD (2018), by 2025 the goal is to change the eating habits of school-age children. However, most EU countries are not achieving the desired changes (Lobstein & Jackson-Leach, 2016; WHO, 2018). A key factor in the process should be consumer behavior change (Wickramasinghe, Chatterjee, Williams, Weber, Rito, Rippin & Breda, 2021) and researchers are working to develop strategies to encourage change behaviors of children and their healthier food choices (John & Chaplin, 2022).

A child's attitude toward food can predict what a child will actually consume (Birch, 1999). Children's attitudes about food influence their choice of consumption (DeJesus, Gelman & Lumeng, 2020). It is important to understand children's attitudes so that we can influence their food choices (Craeynest, Crombez, De Houwer, Deforche, Tanghe & De Bourdeaudhuij, 2005). Attitude has been shown to be the factor with the highest predictive value when choosing food (Gorton & Barjolle, 2013). To change children's behavior toward food, it is necessary to change their explicit and implicit attitudes toward food (MonneryPatris et al., 2016).

There is evidence (Ensaiff, 2021) that interventions are effective in changing food choices among different age groups, and the use of interventions shows encouraging results when it comes to the possibility of changing consumer behavior in the domain of food choices. Interventions to accept a healthy type of food are extremely necessary in today's world.

Behavioral interventions in some cases can trigger attitude change that ultimately leads to a change in behavior. For example, Beattie and McGuire (2020) have shown that with certain interventions based on emotions and information can affect consumers whose implicit attitudes are weakly expressed, and confirmed that video clips based on emotions and information can be effective in changing attitudes.

The main question that arises is whether children's food choices can be predicted by understanding implicit and explicit attitudes in the domain of healthy food choices and which interventions can be effective in trying to change attitudes towards healthier consumer choices.

Material & methods

An experimental quantitative study will be conducted on a sample of 200 elementary school children (6 and 9 years old). Children's explicit and implicit attitudes about food after exposure will be compared with a combination of the most effective emotional and informational video interventions. There will be one pre-test and post-test sessions, during which the child will be subjected to measuring attitudes and behaviors towards food choices.

For the purpose of research, behavioral video interventions will be designed. The intervention will be based on showing emotional and informational videos about the importance of eating healthy food and consequently testing implicit and explicit attitudes

and solving the food choice task. Participants will watch a 3-minute video clip by an influential person (athlete, cartoon character or teacher).

As a measure to test implicit attitudes about food, a customized IAT test for children will be used (Richetin, Perugini, Prestwich & O’Gorman, 2007; Cvencek, Meltzoff & Greenwald, 2011; DeJesus et. al. 2020). Child IAT is a computer word classification test. It requires respondents to classify words into categories, and each word belongs to one of four different categories. During the solution, the test measures time and it is assumed that respondents will more quickly classify terms into categories that are more strongly related in their memory.

A variant of the explicit categorical task of forced choice will be used to measure explicit attitudes about food (Monnery-Patris et al., 2016; Marty, Chambaron, Bournez, Nicklaus & Monnery-Patris, 2017), designed to suit the cognitive abilities of primary school children age. Children look at four pictures of healthier food and four pictures of less healthy food, one at a time, and are asked to rate how much they like the food.

After measuring attitudes, the researchers will take each child individually to a separate room and will offer them the opportunity to choose one of the two reward options offered. One of them will be peeled mandarin offered in separate slices, and the other option will be jelly candy in the shape of a mandarin (Naderer, Matthes, Binder, Marquart, Mayrhofer, Obereder & Spielvogel, 2017). Each child will be allowed to choose only one of the two snack options.

Results

In this research, the following relations are predicted:

- Food attitudes are positively related to children's food choice behavior
- Positive attitudes about healthy food influence the choice of healthy foods
- Behavioral interventions based on emotions are effective in creating children's positive implicit attitudes about healthy food among six-year-olds
- Behavioral interventions based on information are effective in creating positive explicit attitudes of children about healthy food among nine-year-olds
- After exposure to an emotional message, implicit attitudes about healthy food will be more positive in six-year-olds
- After exposure to an informative message, explicit attitudes about healthy food will be less negative in nine-year-olds

Implications

Digital interventions at school can be an effective method for changing children’s attitudes and behaviors toward food choices. Children will be more receptive to healthy food choices if they notice that influential people and peers are exhibiting the same behavior.

Interventions will influence positive changes so that children will show (a) more positive attitudes towards fruits and vegetables, (b) more positive beliefs that fruits and vegetables make a person strong and (c) more frequent consumption of fruits and vegetables compared to the non-intervention group.

For the first time, interventions will be used to change attitudes and food choices in combination with measuring implicit and explicit attitudes of primary school children. Also, it will be examined whether the selected interventions can bridge the gap that is created between the attitudes and behavior of consumers when choosing food.

Farmers' willingness to pay (WTP) for innovative cattle feeds additives

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Abstract

Human-induced greenhouse gas emissions (GHGEs) must be decreased by 11 to 30% of the 2010 level by 2030 in the European Union as per the Paris Agreement. Agriculture produces about 12% of the total GHGEs, where the greatest contribution to emissions is given by livestock enteric fermentation. In fact, enteric methane (CH₄) has a comparative warming effect that is 34 times greater than the one of carbon dioxide (CO₂) per kg. (FAO, 2022). Many climate-friendly innovations in cattle farming can contribute substantially to enteric methane mitigation, such as improved feed quality, ration balancing, improving reproductive efficiency, and breeding. Between these, dietary management is the immediate CH₄ emission mitigation option at the farm level. Farmers' adoption of innovation is not a smooth process, and it is generally slow. Long T.B., et al. (20 gave an overview of the barriers to the adoption and diffusion of technological innovation for climate-smart agriculture in Europe. However, there are financial instruments such as carbon taxes and carbon markets that could facilitate the transition.

This research investigates farmers' willingness to pay (WTP) for innovative cattle feed additives that reduce GHGs from enteric fermentation. In addition, this research explores the effectiveness of different policy interventions geared to facilitate farmers' usage of these innovative feed additives. The first intervention is the introduction of certification by Carbon Trust about the ability of the innovative additives to reduce methane emissions in ruminants. The second intervention consists of the introduction of a tax on the GHGs produced by cattle. To the best of our knowledge, no study has investigated farmers' demand for innovative cattle feed additives and the role of different types of interventions on farmers' willingness to use this type of mitigation innovation using experimental auctions. A recent review on farmers' WTP for innovations reports that only a few articles have studied farmers' behavioural factors, whereas there is no evidence of their preferences given a carbon tax.

A field experiment will be conducted with a sample of approximately 150 cattle farmers from the Lombardy region. Farmers' WTP for 1Kg of grain mixed with hay plus a specific feed additive is elicited using the Becker–DeGroot–Marschak (BDM) mechanism. The experimental design encompasses three treatments: i) a control group that is not exposed to any of the interventions, ii) a group which is exposed to the Carbon Trust's certification, iii) a group which is exposed to the introduction of a carbon tax, and iv) a group which is exposed to both interventions.

We expect the two interventions to facilitate farmers' adoption of the innovative cattle feed additives that reduce GHGs from enteric fermentation. While we are not able to predict what would be the effect of the labelling intervention, we expect that rational farmers' WTP for such additives should be at the level of tax avoidance. The results provide the basis for the literature on innovative cattle feed from a behavioural perspective. Furthermore, whereas previous studies indicate that a tax would reduce global production of beef, increasing slightly the production of pork, poultry and raw milk, this result could be used to inform

policymakers of the minimum amount of carbon tax needed to push innovation towards environmentally friendly technologies, and so to meet the target set under the Paris agreement.

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Delayed premium payments improve crop insurance uptake, but at what costs? The role of time preferences

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Abstract

Recent studies recommend deferred insurance premium payments until harvest, in order to increase uptake of crop insurance among liquidity-constrained. However, crop insurance purchases do not only transfer incomes from a good to a bad state of nature, but also across time. Hence, the extent to which individuals' trade-off present consumption desires for the future may affect crop insurance uptake decisions. In this study, we investigate the impact of time preferences on the uptake of a heterogeneous Ideal Area Yield (IAYI) Insurance product, using a sample of cocoa farmers from Ghana. We employ field experiments to elicit farmers' time preferences, and characterize them with the quasi-hyperbolic discounting. We then use linear and quantile regressions to analyze the drivers of time preferences measure. Finally, we employ a hybrid choice model that allowed us to jointly estimate attributes of the insurance product, farmers' stated attribute non-attendance (ANA), and some attitudinal variables, while avoiding potential endogeneity biases. The empirical results indicate that while the short-run measure of time preferences significantly decrease the demand for attributes of the insurance product, the long-run measure appears to enhance demand. Farmers also tend to favor insurance product with delayed payments until harvesting.

Keywords: attribute non-attendance (ANA), cocoa, ideal area yield insurance, rate of time preferences, quasi-hyperbolic discounting, JEL Codes: E21, G22, G52, Q18, Q54

Social learning, incentives, and the decision to adopt improved sweetpotato varieties: Experimental evidence from Uganda

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Abstract

Improving the welfare of millions of farming households in the developing countries ultimately requires a shift from subsistence low-input agriculture to commercial agriculture that relies on productivity-increasing technologies. In most developing countries, access to and use of quality certified seed (QCS), a key input into the production process, remains a major challenge. The majority of farmers rely on low-yielding recycled/saved seed or seed obtained from local sources which are often loaded with pests and diseases. Consequently, new superior varieties end up on lab “shelves” as farmers resort to repeated planting of old less-performing varieties, often called farmer/local varieties. In some crops, farmers maintain in their field a large number of these local varieties. The subsequent low variety turnover has been associated with low crops yields and welfare-reducing effects in developing-country agriculture.

Farmers’ decision to adopt QCS is often constrained by unavailability, inaccessibility, lack of awareness about the advantages of growing QCS especially with regard to plant health, and limited knowledge about the sources of QCS and how to maintain quality seed on farm for greater yields. In this study, we address the seed availability constraint by introducing QCS at the village level and we focus on sweetpotato planting material (also known as vines). Furthermore, we contribute to existing research on farmers’ technology adoption by addressing the awareness and knowledge constraints while implementing a “quasi-extension” mechanism through which farmers can obtain information about QCS using trained village model/champion farmers, henceforth referred to as disseminating farmers (DFs). We then examined the effect that social recognition as a reputational incentive for knowledge diffusion by DFs has on smallholder farmers’ willingness to pay (WTP) for quality certified seeds. We specifically sought to test the hypothesis that social recognition would incentivize DFs to disseminate information about QCS of sweetpotato hence increase WTP for the quality vines. We also tested the mechanisms through which social recognition influences smallholder farmers’ WTP for QCS. We employed the 2nd price experimental auction method to measure farmers’ willingness to pay for QCS. The study was implemented in Uganda where the majority of sweetpotato farmers recycle their vines, often many times, and maintain large number of local varieties in their farms. Uganda is one of the leading sweetpotato producing countries globally and is a secondary center of diversity in sweetpotato varieties – it has more than 3,000 local and new improved varieties. Thus, sweetpotato and Uganda provide an interesting case to study.

The study participants were recruited from Katakwi district of Teso region of Uganda, a leading sweetpotato growing district. All the counties and sub-counties in the district were

purposely selected for the study. Within sub-counties, 61 out of the 131 parishes were selected using probability proportionate to size sampling and randomly assigned into two treatments arms (treatment = 30, and control = 31). Within each parish, one village was randomly sampled and in that village 11 sweetpotato farmers randomly sampled and invited to participate in the auction. Hence a total 671 farmers sweetpotato farmers participated in auctions.

To relax the constraints of QCS awareness and knowledge, we recruited one DF in each of study villages (hence a total of 61) with the help of local administration and agricultural staff. All the 61 treatment and control DFs were given one-day structured in-room training covering production, marketing, and conservation of quality certified sweetpotato vines. The training was followed by a field visit to a trained and certified sweetpotato vine multipliers' farm in which aspects covered in the training room were illustrated and reinforced. Each DF was then given the names of the 11 randomly selected farmers from his village (henceforth, co-villagers) with the instruction that s/he should disseminate/share what they learned with all the farmers in the list they received, and others they wished to.

The treatment comprised two parts, in addition to the in-room training and field visit: i) *social recognition* – the treatment group was informed that the name of the best performing DF would be published at the sub-county agricultural office recognizing/declaring him/her as champion sweetpotato farmer, ii) *goal-setting* – the treatment DFs were asked to set their own intrinsic goals in relation to how they intended to carry out the task of passing the knowledge received about QCS to other farmers. The number of co-villagers reached and their score on test questions based on the DF training material provided a measure of performance used to assess the DFs' level of effort. The DFs were also invited to participate in the auction in their respective villages, along with co-villagers. Thus, each auction was attended by 12 participants, hence a total of 732 for the 61 villages. During each auction, four varieties of sweetpotato vines (namely Naspot 13, Narospot 1, Ejumula and Tanzania) from certified source were presented. The vines were tested prior to use for the devastating and yield reducing sweetpotato virus diseases and confirmed to be free of them.

The auctions were conducted in April and May 2022. In total 645 farmers participated, hence a response rate of 88%. The absences were caused by multiple reasons including illness, travel, and displacement caused by insecurity. Contrary to our expectations, results of descriptive analysis shows that DFs in the control group fared better than their treatment counterparts. They reached 47% of their linked farmers (i.e., co-villagers) while treatment farmers reached 30%. Farmers in non-treatment villages also show higher bids in the auctions.

Intent-to-treat regression estimates with error terms clustered at village level and controlling for sub-country effects, yields statistically and large increases in WTP for the Ejumula and Naspot 13 varieties, but not for the Tanzania and Narospot 1 varieties for the pooled sample comprising all the 645 auction participants. To test the mechanism through which treatment works, we ran the analysis for DFs and co-villagers separately. This time, we find null results for DFs and the direction of effect is now mostly positive except for Ejumula variety. In addition, the estimated parameters are rather imprecise. Estimation of the same model for co-villagers, on the other hand, yields significant parameters for Ejumula and Naspot 13. These results remain robust when co-variables are added to control for other effects.

While contrary to our hypothesis, these results point to the possibility that rather than incentivizing higher performance the reward (social recognition) used in this study combined with goal-setting instead acted to stymie DFs' effort. This finding may point to the possibility that altruism outweighed social recognition and a possibility of a shift of frame of reference

from altruism to some other aspects, hence crowding out effect, which is in line with the strand of literature of rewards (see Bénabou and Tirole, 2006⁴). Thus, we conclude that social recognition did not have unambiguous effect on willingness to pay for QCS of sweetpotato varieties.

⁴ Bénabou, R., & Tirole, J. (2006). Incentives and prosocial behavior. *American Economic Review*, 96(5), 1652-1678.

Observing Purchasing Behaviours: Laboratory Store vs. Supermarkets

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Abstract

Problem and relevance

In 2016, two almost identical field and laboratory experiments took place in France to examine the nutritional impact of different front-of-pack labelling schemes, providing a unique opportunity to undertake a methodological comparison.

In response to the rising health costs generated by the obesity epidemic, the political response has been to pass a bill to introduce a harmonized system that will be most effective in changing consumer purchasing behavior. The French health modernization law of 26 January 2016 calls for a nutrition labelling system based on the nutritional composition of products. Former French Health Minister Marisol Touraine advocated the Nutri-Score, a simplified labelling format that classifies foods from A, green and healthy, to E, red and unhealthy. Her proposal triggered a heated debate among stakeholders, who questioned its effectiveness and the resulting stigma that such a label might carry.

To settle the matter, the French authorities brought together all food stakeholders and launched a competition: each stakeholder was invited to propose a labelling format which will then be tested during a trial period to see which one is the most efficient in encouraging consumers healthier food choices. Four formats joined the contest: the *Reference Intakes*, *SENS*, respectively endorsed by the food industries and the retailers, the *Multiple Traffic Lights* and the *Nutri-Score*.

A large natural field experiment was therefore carried out in 60 supermarkets to see which format was best for changing food purchases towards healthier diets. Given the heat of the debate, the Ministry of Health needed robust results that would be difficult to dispute. It therefore decided to complement the natural field experiment with a laboratory framed-field experiment. The two studies are respectively detailed in Dubois et al. (2020) and Crosetto et al. (2020)

Material and methods

Both studies used the same experimental designs by observing purchasing behavior before and after the implementation of a labelling scheme (difference-in-difference approach) and using the same outcome measures (FSA score normalized by 100 kcal, Rayner et al., 2009). The natural field experiment included 60 supermarkets in 4 French regions with 10 shops per system and 20 shops for control. The study lasted 10 weeks from 26 September to 4 December 2016. Consumers were informed about the local intervention in each treatment supermarket by leaflets and totems. In the labelling phase, 1266 products from four departments (Fresh prepared products, canned prepared products, pastries, industrial breads) were labelled with stickers. The coverage of the logos was between 45% and 75%, mainly of retailer branded products. The food purchases of 171,827 loyalty card holders were recorded.

On the other hand, the framed field experiment took place on the experimental platform of the Grenoble Polytechnic Institute. The study included 51 sessions of 1h30 each from 21 November to 2 December 2016. 832 participants were invited to shop for their household over two days. They made their choice from a paper catalogue of 290 products. They had to

perform this task twice, with and without the presence of a labelling system (All 290 products were then labelled). At the end of the session, they actually bought a quarter of their food basket.

Results

Both studies resulted in the same ranking, with Nutri-Score being the most effective label, i.e. the one that generates the largest decrease in FSA score. However, the size of the effects of nutrition labels was on average 17 times smaller in the natural field experiment than in the framed field experiment.

Implications

When considering the potential causes of differences between laboratory and field studies, the literature generally points to the following five usual suspects: (i) The Hawthorne effect, i.e. the nature and extent of scrutiny of a person's actions by others; (ii) The stakes of the decisions; (iii) The characteristics of the sample; (iv) The laboratory context, which may differ from the ecological context; (v) The nature of the laboratory task, which may not perfectly replicate decisions made in the field.

The first three arguments can be quickly dismissed. Both samples were aware that they were being scrutinized; both studies involved small stakes; the participants in both studies had similar key characteristics. Consumer attention, however, was very different. The framed field experiment examined two consecutive purchase decisions, whereas the natural field experiment examined multiple purchase decisions over several weeks. In addition, the logos were more visible in the catalogues of the laboratory study than on the shelves of the field study. Control generates saliency.

Laboratory control comes at a cost. Due to the increased consumer attention, the laboratory clearly overestimates the impact of the intervention. This contradicts Herbst and Mas (2015) who found no quantitative difference. Is this difference in effect size significant? No, if the objective is to choose the "best" option. The magnifying glass effect allows the laboratory to better discriminate the impact of competing labelling schemes. Yes, if the objective is a cost-benefit analysis. Effect size is important when simulated results are used to assess future implications for society (e.g. in epidemiology).

The influence of information on the willingness of young people to participate in preservation of biodiversity - the case of the Istrian donkey

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Abstract

Problem and relevance

Biodiversity can be defined as the diversity of life at the level of genes, species, and ecosystems. Biodiversity includes the diversity of local and global species, the genetic diversity of populations and species, the spatial extent and condition of wild habitats, and the functioning of ecosystems necessary for human survival. However, despite more than a century of action by policy makers and conservation organizations, biodiversity is declining. Humans are changing biodiversity in complex ways. For example, they can increase biodiversity in ecosystems through the introduction of new species or through restoration efforts, but more often they cause the loss of native biodiversity. Although the primary cause of biodiversity loss is unsustainable human appropriation of natural resources, poor application of the concept of biodiversity also hinders efforts to address the declining trend.

Local breeds are often considered in the literature as a factor contributing to the conservation and restoration of biodiversity in a given area. Local breeds contribute to biodiversity in several ways: maintenance of genetic diversity, conservation of grazing lands, maintenance of landscape balance, and more. In addition, local breeds are adapted to local conditions so that natural harmony is maintained. However, due to population growth, the demand for a greater amount of food (e.g., meat and milk) has also increased, and in the globalized world, local breeds are being replaced by conventional breeds. This has led to a drastic decrease in the number of animals of local breeds worldwide, including in Croatia, and these breeds are threatened with extinction.

One of the endangered local breeds in Croatia is the Istrian donkey, which originates from the County of Istria. The Istrian donkey is one of the three local donkey breeds in Croatia, along with the Dinaric littoral donkey and the North Adriatic donkey. In 2021, there were 863 animals of Istrian donkeys in Croatia, most of them in Istria County, which represents 18% of the total number of animals of autochthonous donkey breeds.

Successful conservation of the endangered Istrian donkey requires the support of local citizens/consumers. In this preliminary study we investigated the willingness of young people in Croatia to participate in the conservation of the Istrian donkey.

The aim of the study was to find out whether the information about the endangered status of the Istrian donkey, as well as the information about possible ways of citizens' engagement in the conservation of the donkey, had an impact on the willingness of respondents to participate in these conservation activities.

Material and methods

For the purpose of this research, we identified three ways in which consumers can participate in the conservation: financial support for the breed conservation program (the annual payment of money to a fund for the preservation of the Istrian donkey), consumption of Istrian donkey meat (based on the "conservation by eating" concept, which states that the

consumption of donkey meat stimulates breeding of the same breed), and promotion of the Istrian donkey through social networks.

The online questionnaire was designed and created using the 1KA tool, and the collected responses were processed and analyzed using IBM SPSS Statistics 21. The questionnaire contained closed questions about the socio-demographics of the respondents, their familiarity with the concept of biodiversity, their attitude towards biodiversity and the Istrian donkey, and their willingness to participate in the conservation of the Istrian donkey. Before the attitude questions, the definition of biodiversity was presented in order to familiarize all respondents with the concept.

In order to test the influence of information on willingness to participate in the conservation of the Istrian donkey, respondents were randomly divided into three groups. The first group was a control group, i.e. no information was given. The second group received information about the endangerment of the Istrian donkey and its role in the conservation of biodiversity in Istria County. Finally, the third group was given the same information as the second group, but was additionally explained three above mentioned ways to conserve the Istrian donkey.

The survey was conducted from January to March 2022 on a convenience sample of young respondents in Croatia, recruited through social networks and email.

Results

In total, 481 of the respondents aged up to 30 years completed the questionnaire fully and correctly. Two thirds of them were women, the majority are students who grew up and live in urban areas. 8.5% of the respondents are from Istria. Of the students, a quarter are attending agricultural studies. The average monthly budget of two thirds of the respondents is less than 200 €.

68.4% of the respondents have heard of the Istrian donkey breed, while others did not know this. The vast majority of respondents (91.7%) are familiar with biodiversity and consider biodiversity loss a serious problem. However, only 4.2% of respondents believe that they are trying to protect biodiversity through their behavior, and another 48.2% say that they would like to do even more to protect biodiversity. More than half of the respondents do not believe that they are doing enough to protect biodiversity.

Respondents were divided into three groups based on their random selection of given numbers. The control group comprised 26.8% of the respondents, the group receiving information about the endangerment of the Istrian donkey and its role in biodiversity conservation was the largest group (42.2%) and the group with the most comprehensive information comprised 31% of the sample.

There were no significant differences between the groups in terms of the socio-demographic data of the respondents, as well as their familiarity with the Istrian donkey and their familiarity with and attitude towards biodiversity.

The chi-square test revealed no differences between the three groups in their willingness to participate in the conservation of the Istrian donkey, at a significance level of 5%. The majority of respondents (45.7%) are not sure whether they would financially support the conservation of the Istrian donkey, another 40.1% stated that they would not be willing to pay an annual conservation fee, while only 14.1% stated their willingness to contribute financially to the conservation of the Istrian donkey.

The vast majority of respondents (95.4%) have never tasted meat from the Istrian donkey, and 48% are not even willing to eat it in the future. Nevertheless, the percentage of respondents willing to participate in the conservation of the Istrian donkey according to the

concept of "conservation by eating", i.e. willing to buy donkey meat products in order to preserve the donkey, is higher (26.6%) than the percentage of those willing to support the conservation of the Istrian donkey financially.

Young respondents are most willing to contribute to the preservation of the Istrian donkey by promoting the Istrian donkey on social networks; 37% are willing to do so. The highest willingness (43.7% of respondents) is shown by the third group, which received the most comprehensive information; however, the difference is significant only at the 10% level.

Implications

Although young people are aware of the importance of biodiversity, they feel that they are not sufficiently committed to its conservation. This is confirmed by their willingness to participate in selected activities for the conservation of the Istrian donkey. Therefore, policy makers should find ways to involve young citizens more actively in biodiversity conservation activities.

This research has shown that young people are not sensitive to basic information about the breed's endangerment and its role in biodiversity conservation, nor to information about possible ways to conserve the breed. This means that new ways of raising awareness among young people should be found to involve them in the conservation of the breed.

As expected, young people are most likely to participate in promoting the breed through social networks. Therefore, more use should be made of social network communication to raise young people's awareness of their role in biodiversity conservation.

Notes

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Beef or fish in restaurant: On the role of information about CO2 emissions and social influence

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Abstract

Out-of-home food escapes the various displays put in place for all food products. Besides, the food choices made by individuals during their out-of-home consumption are under-investigated, even though this type of expenditure represents a significant portion of the individuals' food budget (for example, nearly half of the food expenditure of American citizens is dedicated to out-of-home food). We thus propose to investigate individuals' food choices when they are at the restaurant and when they receive an information about the environmental impact of the meals.

Food choices in restaurants are typically different from food choices in supermarkets. Indeed, the individuals directly consume what they choose in restaurants and they also often make their choices in the presence of others (friends, work colleagues, relatives...). The latter renders individual food choices in restaurants complex to study as the social dimension of eating in restaurants may reinforce the existence of a social norm of food choices at the same table. This social dimension may in turn be useful to better disseminate information within a specific group of persons.

In this paper, we ask whether information about CO2 emissions of the main meal on a restaurant menu alters the choice of guests between beef and sea trout under high or low social influence of other guests around the table. We followed a 2 x 2 design differentiated by the information given or not and the high or low social influence. For guests with the information, they could read on the menu that "Consuming beef participates 6 times more to climate change than consuming sea trout: producing 1 kg of beef emits 6 times more CO2 than 1kg of sea trout"; guests without information had only the meals presented on the menu. For guests with the high social influence, they were allowed to discuss before making their choice of the main meal whereas for guests with the low social influence, they had to choose their main meal without communication with other people around the table. We also asked guests to reply to a short questionnaire about their meal preferences and their expectations regarding other guests' food choice of the main meal (the social norm).

We ran experiments at the Living lab of the Institut Paul Bocuse in Lyon, France, between April and June 2022. In total, 491 guests participated in our experiment. Guests are used to come to the Living lab for lunch or dinner to eat high quality food at lower prices as students of Institut Paul Bocuse cook and serve. Guests pay for their menu. The results show that beef is slightly less chosen when guests receive information about CO2 emissions of the two main meals. When guests can communicate before the choice of their meal, a higher share of guests choose the same meal. We are currently analyzing the influence of expectations about others' choices as well as discussions before the choice of the main meal.

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