The Influence of Information on Beliefs and Preferences for Ground Beef by U.S. Consumers

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Introduction

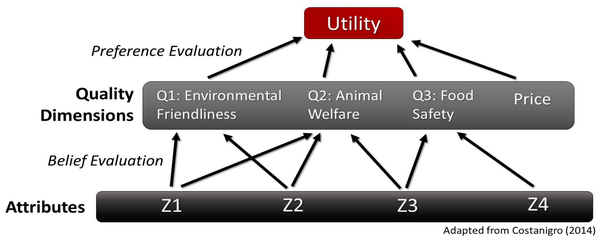
- Consumer beliefs about labels are emerging as important factors in explaining observed behavioral differences in consumer demand studies (see for example Lusk et al., 2013).
- Constangiro and Onozaka (2020) conceptualized subjective beliefs as the filter through which product attributes are mapped into quality dimensions; and preferences as the subjective trade-offs between quality dimensions and price.
- The malleability of consumer beliefs about food labels given new information is unknown.

Objective

- Apply the Constangiro and Onozaka (2020) beliefs-preference model to the relatively unexplored product of ground beef.
- Assess how consumers change their beliefs about organic ground beef given new information.

Methods

Conceptual Model



Adapted from Costanigro (2014)

Empirical Model

Survey Tasks and Data

- Nationally representative sample, n = 1,028
- Online survey administered through Toluna Panels during early May 2023.
- Flow: Qualifiers > Demographics > Belief Choice Experiment 1 > Information Treatment > Belief Choice Experiment 2 > Preference Choice Experiment

Belief Evaluation Choice Experiment

$$Q_{ij}^{q} = \left(X_{ij}; \beta_i^q\right) + \varepsilon_{ij}^{q} = \beta_{i1}^{q} Organic_{ij} + \beta_{i2}^{q} Lean80_{ij} + \beta_{i3}^{q} Lean90_{ij} + \beta_{i4}^{q} ASC + \varepsilon_{ij}^{q};$$

for ***q*** **= Environmental Friendliness, Animal Welfare, and Food Safety**

- Estimated using random parameter logit model

Belief-Preference Evaluation Choice Experiment

$$U_{ij} = \left(\widehat{\boldsymbol{Q}}_{\boldsymbol{ij}}; Price; \gamma;\right) + v_{ij}$$
$$= \gamma_1 Envmt + \gamma_2 AmlWlfr + \gamma_3 FdSfty + \gamma_4 Price + v_{ij}$$

- Prices were determined using the mean of national ground beef prices from USDA-AMS and altering in increments of $.50 up to +/-$1.50 from the mean.
- Estimated using multinomial logit model.

Changes in Beliefs about Organic Ground Beef

- Assess if the mean of distribution of organic coefficient is statistically different than base post information treatment.

Results

Table 1. Mixed Logit Model of Beliefs – Aggregated

	Environmental Friendliness		Animal Welfare		Food Safety	
	Coefficient	Standard Deviation	Coefficient	Standard Deviation	Coefficient	Standard Deviation
Organic	1.24***	1.11***	1.29***	1.58***	1.26***	1.80***
	(0.08)	(0.13)	(0.10)	(0.015)	(0.11)	(0.16)
Lean-to-Fat Ratio 80-89%	0.31***	1.03***	0.36***	0.99***	0.37***	0.95***
	(0.09)	(0.17)	(0.09)	(0.18)	(0.09)	(0.18)
Lean-to-Fat Ratio >90%	0.62***	0.74***	0.62***	0.77***	0.69***	0.69**
	(0.09)	(0.21)	(0.09)	(0.22)	(0.08)	(0.24)
ASC	0.19**	1.47***	0.38***	1.58***	0.46***	1.75***
	(0.11)	(0.12)	(0.10)	(0.13)	(0.11)	(0.14)

Notes: **p<0.05, ***p<0.01. Number of observations = 8,916; Number of cases = 2,972; Number of individuals = 743; Log-likelihood = -2681.64.

Table 2. Multinomial Regression of Belief-Preference Model - Aggregated

	Coefficients
Environmental Friendliness	0.19***
	(0.04)
Animal Welfare	0.11***
	(0.03)
Food Safety	0.12***
	(0.03)
Price	-0.47***
	(0.02)
ASC	-3.72***
	(0.13)

Notes: **p<0.05, ***p<0.01. Perceived qualities are obtained from the output from the random parameter logit model from Table 1. Number of observations = 11,145; Number of cases = 3,715; Number of individuals = 743; Log-likelihood = -5,902.11.

Figure 1. Willingness-to-Pay Decomposed by Quality Dimensions

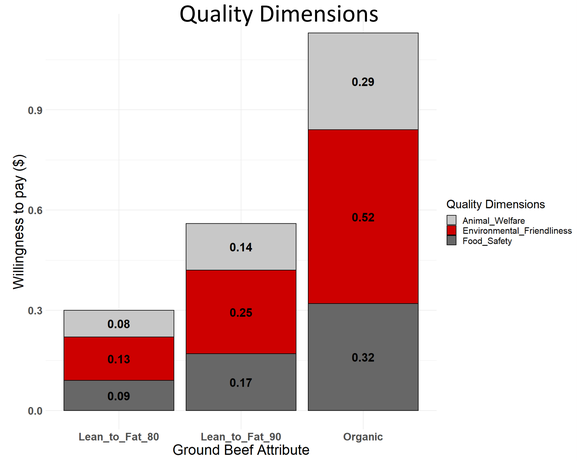
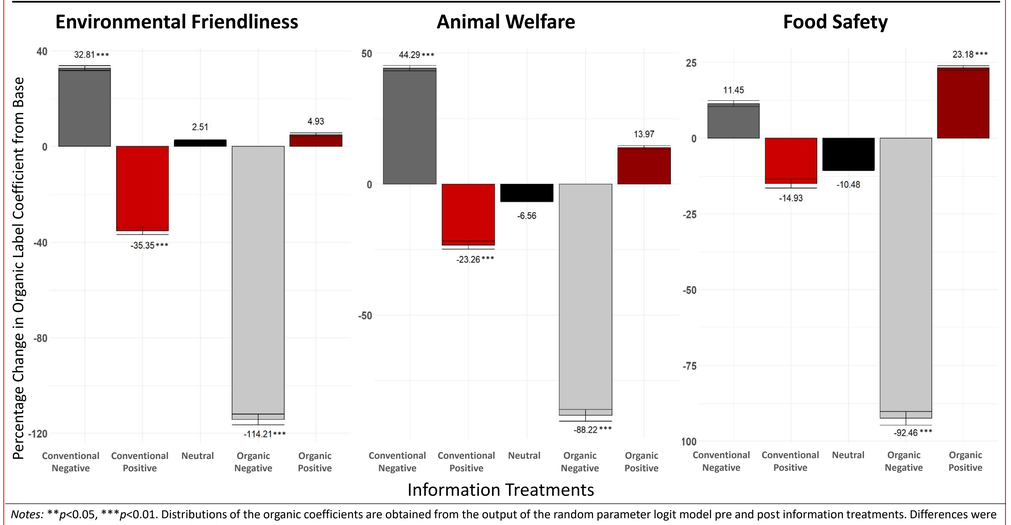


Figure 2. Change in Mean of Organic Label Coefficient Post Information Treatments in Three Belief Choice Experiments



Notes: **p<0.05, ***p<0.01. Distributions of the organic coefficients are obtained from the output of the random parameter logit model pre and post information treatments. Differences were assessed using the Wilcoxon Signed Rank Test.

Discussion

- Consumers believe that organic ground beef is superior to conventional ground beef in terms of environmental friendliness, animal welfare, and food safety.
- Among the three quality dimensions, environmental friendliness was the most important to consumers.
- Consumers indicated that they were willing to pay $1.10/lb more for organic ground beef.
- 47% of the willingness to pay for organic ground beef is attributable to perceived greater environmental friendliness, 26% is attributable to perceived higher animal welfare, and 27% is attributable to perceived greater food safety.
- Presenting consumers with negative information about conventional or organic beef production elicited greater change in the perceived value of organic beef when compared to positive information treatments. Particularly, the organic negative information treatment elicited the greatest change.
- Because most consumers have a favorable view of organic beef production, the drastic change in the value of organic after the negative organic information treatment suggests that beliefs about organic production may be malleable.

Conclusion

- Relative to other models, the 2-step belief-preference elicitation offers advantages in terms of ease of use for respondents and combating endogeneity.
- Beliefs about the value of organic and conventional ground beef showed evidence of malleability given new information.
- Further analysis to assess how information treatments affect the trade-offs between quality dimensions and price is warranted.

References

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