U.S. Consumer Appetite for Climate Claims on Beef Products

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Selected Poster prepared for presentation at the 2024 Agricultural & Applied Economics Association Annual Meeting, New Orleans, LA: July 28-30, 2024

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BACKGROUND

- Demand for "climate-friendly" beef could create economic incentives needed to spur U.S. cattle producers to adopt emissions reducing practices
- Beef products with varying climate claims have recently been introduced in the retail sector (e.g., Tyson's BRAZEN™ Beef claims a 10% greenhouse gas (GHG) emissions reduction [(1)]; Uruguay's Cradle-to-Gate beef claims carbon neutrality [(2)])

OBJECTIVE

To quantify differences in U.S. consumer willingness-to-pay (WTP) for distinct climate claims on ground beef and ribeye products, accounting for country-of-origin (COO) impacts.

DATA

Nationally representative survey of U.S. public (*N*=2288)
Administered online in November 2023

SURVEY DESIGN

This study uses a split-sample experimental approach. Respondents were randomly assigned into one of four groups:

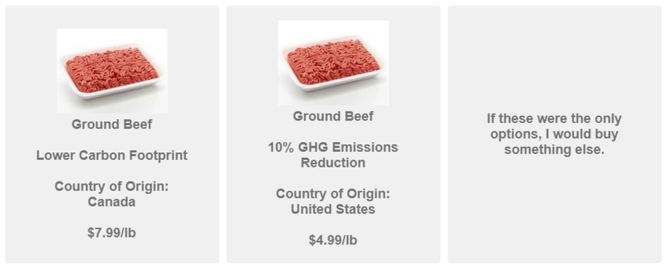
Group A Ground Beef Included COO	**Group B** Ground Beef Did not include COO
Group C Ribeye Steak Included COO	**Group D** Ribeye Steak Did not include COO

Choice sets varied on climate claim, country-of-origin (if included), and price.

Climate Claims:
- Carbon Neutral
- Lower Carbon Footprint
- 10% GHG Emissions Reduction
- [no claim]

Countries-of-Origin:
- Australia
- Canada
- United States
- Uruguay

Figure 1. Group A survey choice set example



RESULTS

Table 1. Estimated WTP for attributes by choice experiment group ($/lb.)

Attribute	**Group A** (Ground Beef)	**Group B** (Ground Beef)	**Group C** (Ribeye Steak)	**Group D** (Ribeye Steak)
Climate Claim				
Carbon Neutral	0.17 [-0.20, 0.54]	-0.16 [-0.46, 0.14]	1.29*** [0.25, 2.34]	0.63 [-0.23, 1.47]
Lower Carbon Footprint	0.54*** [0.16, 0.91]	-0.10 [-0.38, 0.19]	1.68*** [0.58, 2.78]	0.49 [-0.32, 1.31]
10% GHG Emissions Reduction	0.41** [0.04, 0.78]	-0.55*** [-0.91, -0.18]	0.97* [-0.09, 2.03]	-0.68 [-1.72, 0.38]
Country-of-Origin				
Australia	-0.83*** [-1.30, -0.36]		-2.43*** [-3.55, -1.32]	
United States	2.25*** [1.68, 2.83]		3.19*** [1.78, 4.59]	
Uruguay	-1.97*** [-2.55, -1.38]		-4.49*** [-5.86, -3.13]	

Notes: WTP estimates are derived from mixed logit model coefficients estimated using simulated maximum likelihood in NLOGIT. Lower and upper levels of 95% confidence intervals are included in square brackets. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Canada is the "base" country dropped for country-of-origin comparisons.

EMPIRICAL ESTIMATION

Mixed logit models are used to estimate WTP for beef product attributes, including climate claims and COO [(3)]

A consumer's random utility is U, where the utility for option j for individual i in choice situation t is described by

$$U_{ijt} = \lambda_i' x_{ijt} + \varepsilon_{ijt.}$$

x_{ijt} : A vector of observed variables
λ_i : Unobserved for each individual and varies within the population density $f(\lambda_i \mid \theta^*)$
θ^* : The true parameters of the distribution
ε_{ijt} : The stochastic i.i.d. error component

REFERENCES

[(1)] Tyson Foods, Inc. (2024). Doing better together. 10% is just the start. Brazen Meats: Our Process.
[(2)] Dempsey, C. (2022). Uruguay pioneers carbon neutral meat.
[(3)] Revelt, D., & Train, K. (1998). Mixed logit with repeated choices: households' choices of appliance efficiency level. *Review of Economics and Statistics*, *80*(4), 647-657.

CONCLUSIONS

1. *Lower Carbon Footprint* elicits the highest WTP among climate claims. For ground beef, $0.54/lb. is an approximate 9.0% price premium. For ribeye steak, $1.68/lb. is an approximate 11.2% price premium.

2. WTP estimates for country-of-origin labels indicate consumer preference for U.S. beef products with climate claims. Lack of significance in WTP estimates for climate claims in Groups B and D could indicate country-of-origin is confounded with climate claims.

3. Future work is needed to identify the characteristics and size of the potential target market for beef products with varying climate claims.

ACKNOWLEDGEMENTS

This work was supported in part by the U.S. Department of Agriculture [Award no. 2019-68008-29901]