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## Allowing Consumers to Choose Quantities in Choice Experiments Impacts Consumer Choice, Rationality, and Willingness-to-Pay Estimates

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# Cornhusker Economics

## Allowing Consumers to Choose Quantities in Choice Experiments Impacts Consumer Choice, Rationality, and Willingness-to-Pay Estimates

### Background

Choice experiments are frequently used by industry and academic researchers to examine existing and hypothetical products. These experiments generally fix the quantity purchased and allow product attributes to vary. New choice experiments have explored allowing quantity to be a flexible choice attribute. In a recently published paper, we explored the potential differences and similarities between these two choice experiment frameworks. To illustrate these comparisons and any relative improvements by using a quantity choice framework, we used a between-subject design that assessed U.S. meat preferences.

### Data and Methods

Two choice experiments were developed and administered to a representative sample of the U.S. population. The first experiment (traditional choice experiment) asked individuals to choose between five meat products and an opt-out option. Each product was fixed at 1 lb. The second experiment (quantity choice experiment) asked individuals to choose the quantity for meat products between 0 and 5 lbs. Choosing “0 lbs.” for each meat product was equivalent to the opt-out option in the first experiment. Several adjustments were made to the choices in the second experiment in which consumers chose quantities of meat products, to allow for comparisons to be made across both choice frameworks. The paper provides more details on these changes and the potential impacts on the results.

Choices were used to assess any differences or similarities in choice frequencies, variation, consumer rationality, willingness-to-pay estimates, and consumer meat segments between the two experiments. Further, additional analyses were conducted to demonstrate how allowing consumers to choose quantities allowed for additional understanding of classical demand analysis, consumer preferences for variety, and consumer preferences for habit formation.

### Primary Findings

This study had four primary findings:

1. Generated choice frequencies better aligned with revealed purchase behavior.
2. Consumers’ ability to choose multiple quantities did not affect consumer choice rationality.
3. Meat preferences and attributes of grouped individuals closely aligned with historical behavior on meat purchases.
4. Consumers are willing to pay premiums for products purchased in bundles over individual products.

These primary findings suggest that allowing consumers to choose quantities in choice experiments does not significantly impact key consumer preference characteristics such as rationality and willingness-to-pay measures. It also provides researchers the ability to examine several

choice aspects (e.g. variety, habit, etc.) that were previously not possible when individuals were forced to choose one quantity.

## Implications

The findings from this study provide an initial attempt to understand potential differences in choice experiments where consumers can choose quantities to traditional choice experiments that force a fixed quantity in choice. Future assessments could build on this study in several ways, specifically:

1. Add incentive-compatibility controls more directly into the choice framework: In this study, we did not restrict consumer choice through the use of a budget constraint. The effect of a budget constraint could be added to examine whether or not it modifies consumer choice.
2. The role of “cheap talk” scripts in mitigating hypothetical bias (Lusk 2003; Lusk and Schroeder 2004; Tonsor and Shupp 2011): This study used a “cheap talk” script under a hypothetical purchase scenario. Comparing quantities chosen under actual purchase conditions and a “cheap talk” scenario could verify whether “cheap talk” scripts work to reduce hypothetical bias when consumers can choose quantities of products.
3. Choice volumes or frequencies: This study used meat products that are purchased at a relatively high volume annually with frequent purchases (Gao and Schroeder 2009; Tonsor 2011). One could look at how these comparisons could change given low frequency or low volume purchases and how these compare to other frequencies and volumes across choice frameworks.
4. Quantities used in a classical demand system: This study showed that quantities from choice experiments could be used in classical demand systems to get results similar to those using revealed preference data. How grounded these results are using other demand specifications (e.g. AIDS, Rotterdam, etc.) could be examined and compared across frameworks.

Overall, this initial study hoped to bring awareness to how a new choice framework that allows consumers to choose quantities compares with the traditional and frequently used choice framework that fixes quantities. We have offered several suggestions for further research that would examine how well and to what extent these two frameworks are similar or conflict. Given the frequent use

of choice frameworks in both industry and academic work, such investigations are warranted.

## Acknowledgments

For more information on the data, methods, results, or conclusions referenced, refer to Dennis, E.J., Tonsor, G.T., and Lusk, J.L., 2021. Choosing quantities impacts individuals' choice, rationality, and willingness to pay estimates. *Agricultural Economics*. <https://onlinelibrary.wiley.com/doi/full/10.1111/agec.12678>

## References

- Corrigan, J. R., Depositario, D. P. T., Nayga Jr, R. M., Wu, X., & Laude, T. P. (2009). Comparing open-ended choice experiments and experimental auctions: An application to golden rice. *American Journal of Agricultural Economics*, 91(3), 837– 853.
- Elbakidze, L., Nayga Jr, R., Li, H., & McIntosh, C. (2009). Value elicitation for multiple quantities of a quasi-public good using open-ended choice experiments and uniform price auctions. *Agricultural Economics*, 45(2), 253– 265.
- Gao, Z., & Schroeder, T. C. (2009). Consumer responses to new food quality information: Are some consumers more sensitive than others?. *Agricultural Economics*, 40(3), 339– 346.
- Iyengar, R., & Jedidi, K. (2012). A conjoint model of quantity discounts. *Marketing Science*, 31(2), 334– 350.
- Kim, J., Allenby, G., & Rossi, R. (2004). “Volumetric Conjoint Analysis.” SSRN Whitepaper. June 2. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=552862](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=552862)
- Lusk, J. L. (2003). Effects of cheap talk on consumer willingness to pay for golden rice. *American Journal of Agricultural Economics*, 85(4), 840– 856.
- Lusk, J. L., & Schroeder, T. C. (2004). Are choice experiments incentive compatible? A test with quality differentiated beef steaks. *American Journal of Agricultural Economics*, 86(2), 467– 482.
- Pilon, T. (1998). Extensions to the analysis of choice studies. Sawtooth Software Research Paper Series. Available at: <http://www.sawtoothsoftware.com/download/techpap/extend.pdf>
- Tonsor, G. T. (2011). Consumer inferences of food safety and quality. *European Review of Agricultural Economics*, 38(2), 213– 235.

Tonsor, G. T., & Shupp, R. S. (2011). Cheap talk scripts and online choice experiments: Looking beyond the mean. *American Journal of Agricultural Economics*, 93(4), 1015– 1031.

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