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Using Genetic Information to Improve the Prediction of Food Choice: A Case Study of Alcoholic Beverages

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ABSTRACT:

Individual food choices and consumption are closely relating to one's diet, nutrition, and health. Using the case of alcoholic beverages, this study extends the random-utility framework by incorporating genetic information into consumer demand models, and demonstrates the significant impact of genetic factors on individual food choice decisions in a novel way. Integrating individual-level responses of discrete choice experiments (DCE), genotyping data, and socioeconomic/demographic characteristics of 484 participants collected from face-to-face interviews in mainland China, we employ a machine learning-based classification (MLC) approach to identify and predict individual choices. We show that genetic factors are critical to explaining variations in both general drinking behavior and choices of particular products. The MLC predictive model with both socio-demographic and genetic features yields the highest accuracy of 74.7% and AUC-ROC of 0.85. Our findings warrant further economic studies of human behaviors with the integration of genetic data.

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