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Consumer Willingness-to-Pay for Local Produce: The Case of New York Broccoli

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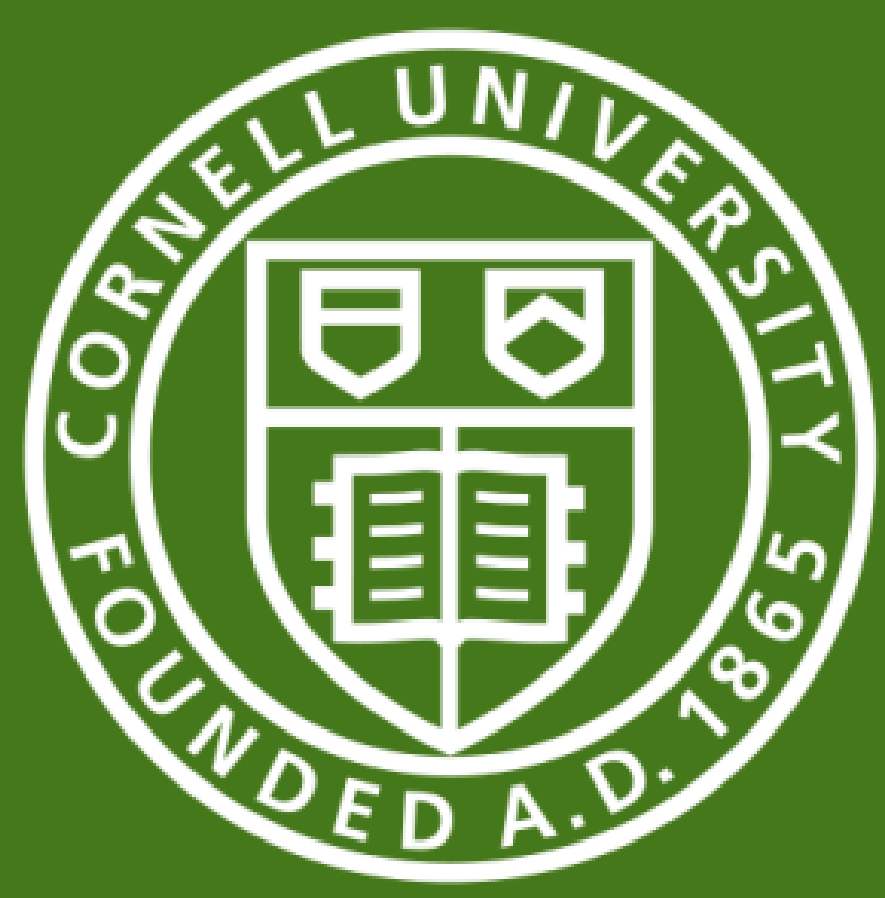
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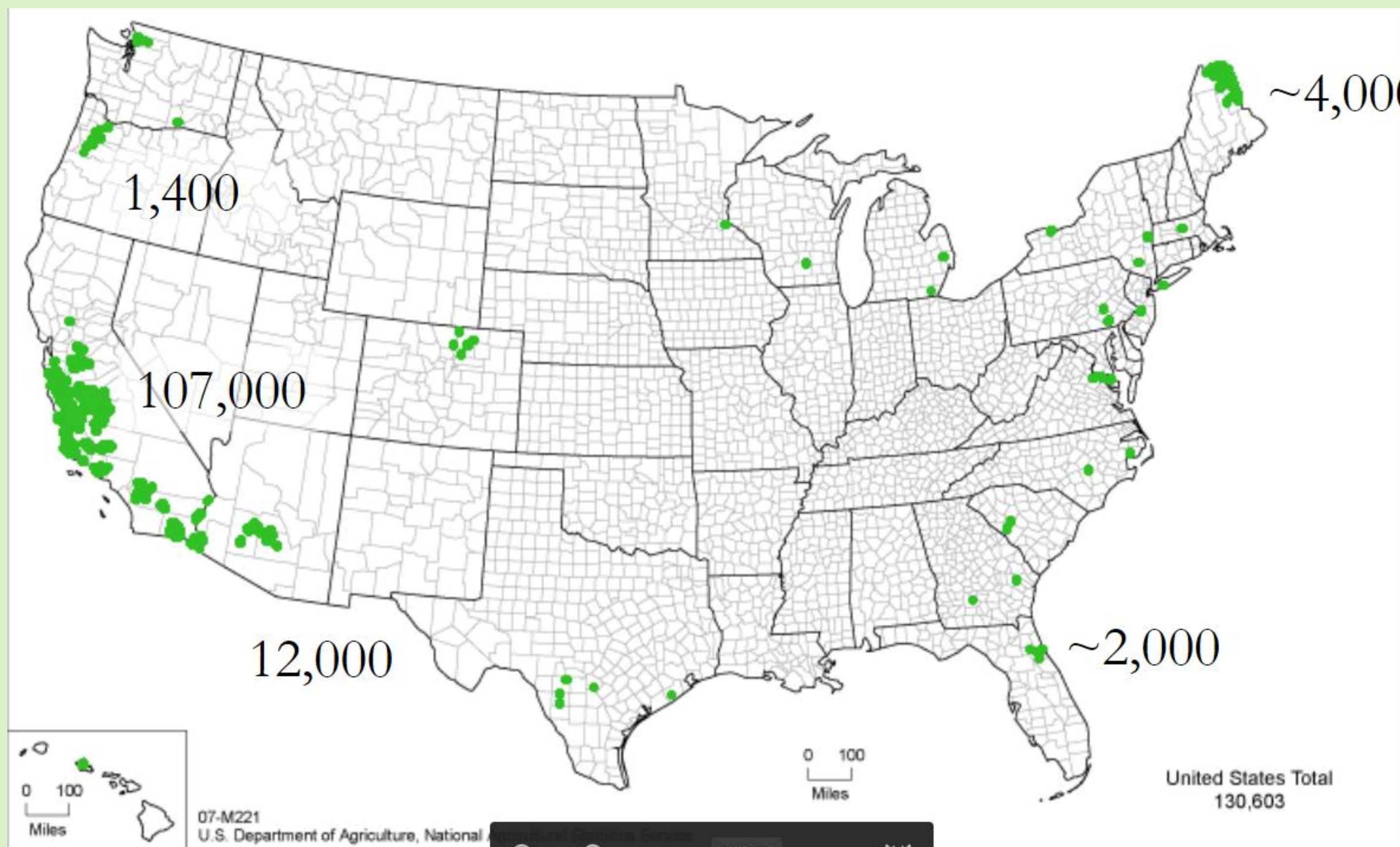
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INTRODUCTION

- Broccoli is a **major specialty crop** with strong growth
 - Value of utilized production reached \$926 million in 2017 (NASS, 2018)
 - Average annual volume growth is around 4%
- Current broccoli **supply** is highly **concentrated**

Broccoli Production in acres (NASS)



- Supplying broccoli locally** along the East Coast would bring multiple **benefits**
 - Provide the consumers with fresher and more options
 - Cut down waste and emission during transportation
 - Support the local vegetable growers and the local economy
- “**Developing an Eastern Broccoli Industry**” project aims to establish a local broccoli supply along the East Coast
 - Plant breeders are developing new varieties adapted to growing conditions in the east coast. However, the product attributes are yet to be improved



OBJECTIVE

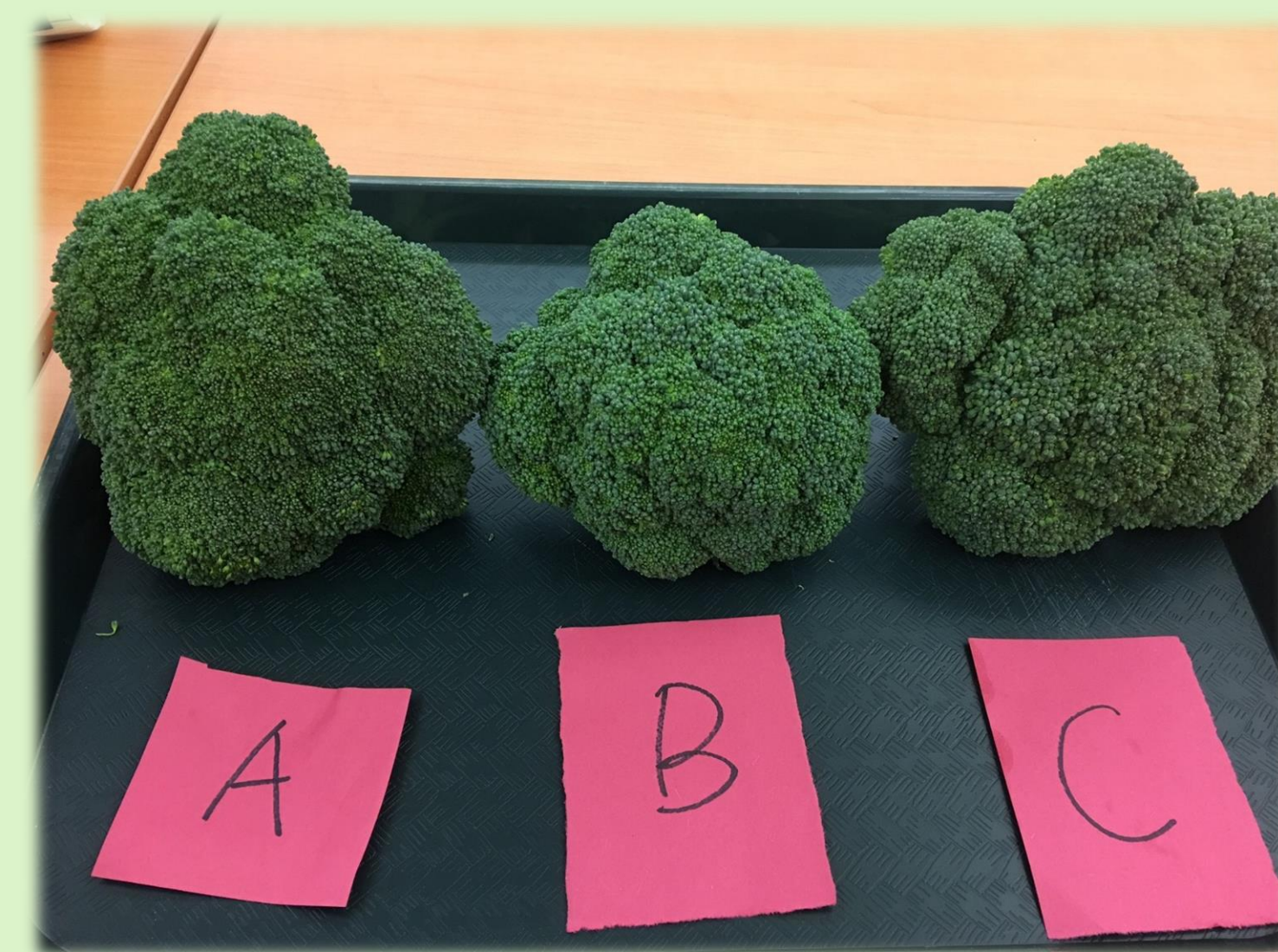
- Examine **consumer acceptance** of the new varieties
- Verify if the east coast consumers are **willing to pay price premium** for the local varieties, i.e. identify the information treatment effect of product origin
- Draw implications for the **pricing** of the local broccoli

EXPERIMENTAL DESIGN

- BDM (Becker-DeGroot-Marschak) auction was used in a lab setting
 - Participants were asked to indicate their maximum WTP for the product being auctioned
- Three varieties were tested, including one California variety and two local varieties

Experimental Procedure

Step	Procedure	Rounds of auctions	Auction type
1	Auction practice	2	Hypothetical
2	Product appearance assessment		
3	Bidding for 1lb of broccoli	3 (one for each variety)	Real (from \$0-5)
4	Product taste assessment (tasting)		
5	Bidding for 1lb of broccoli	3 (one for each variety)	Real (from \$0-5)
6	Exit survey regarding consumer background		



Step 2: 3 types of broccoli were presented



Step 4: samples of 3 types of broccoli were provided for tasting

DATA

- 158 consumers participated in the study in 8 different sessions. Data from 152 participants was used after data validation
- Participants were randomly assigned into two groups
 - Control group: no information regarding product origin was provided throughout the session
 - Treatment group: information regarding product origin, i.e. California vs. New York, was provided at the beginning of the session

Table 1: Consumer Demographics

Variables	Description	Mean	SD
Gender	1 if female; 0 if male	0.73	0.44
Age	Exact age	43.09	13.04
Education	Scale from 1 = less than high school to 8 = professional degree	4.88	1.27
HH_size	No. of people in the household	2.50	1.24

Table 2: Consumer Behavioral Variables

Variables	Description	Mean	SD
Primary_shopper	1 if he/she is the primary shopper in the household; 0 if otherwise	0.80	0.40
Broccoli_frq	Broccoli consumption frequency per month: scale from 1 = “< 1 time” to 5 = “> 15 times”	2.58	0.93
Perceived_price	Cost of 1lb of broccoli based on previous shopping experience	2.26	0.80
Organic	1 if >10% of his/her broccoli purchase is organic; 0 if otherwise	0.73	0.44

Table 3: Consumer Acceptance and WTP (mean)

Variables	CA variety	NY variety 1	NY variety 2
Appearance rating (1 to 9)			
• Control	7.17	6.18	5.97
• Treatment	6.79	6.56	6.50
WTP (\$ per pound) for 1 st round of bidding			
• Control	2.01	1.83	1.83
• Treatment	2.13	2.07	2.19
Taste rating (1 to 9)			
• Control	6.11	6.50	6.24
• Treatment	6.03	5.94	6.69
WTP (\$ per pound) for 2 nd round of bidding			
• Control	1.82	1.94	1.91
• Treatment	1.95	2.03	2.16

RESULTS & CONCLUSION

Table 4: Information Treatment Effect Using Random-effects GLS/Tobit Model*

Variables	Dependent variables			
	Look	Taste	Bid1	Bid2
Variety NY1	-1.011***	0.416	-0.191*	0.128
Variety NY2	-1.202***	0.191	-0.175*	0.103
Variety NY1* info	0.765	-0.547	0.132	-0.041
Variety NY2* info	0.907**	0.514	0.254	0.130
Info ¹	-0.266	-0.023	0.082	0.095

*p < 0.10; **p < 0.05; ***p < 0.01; demographic variables and intercept not shown here

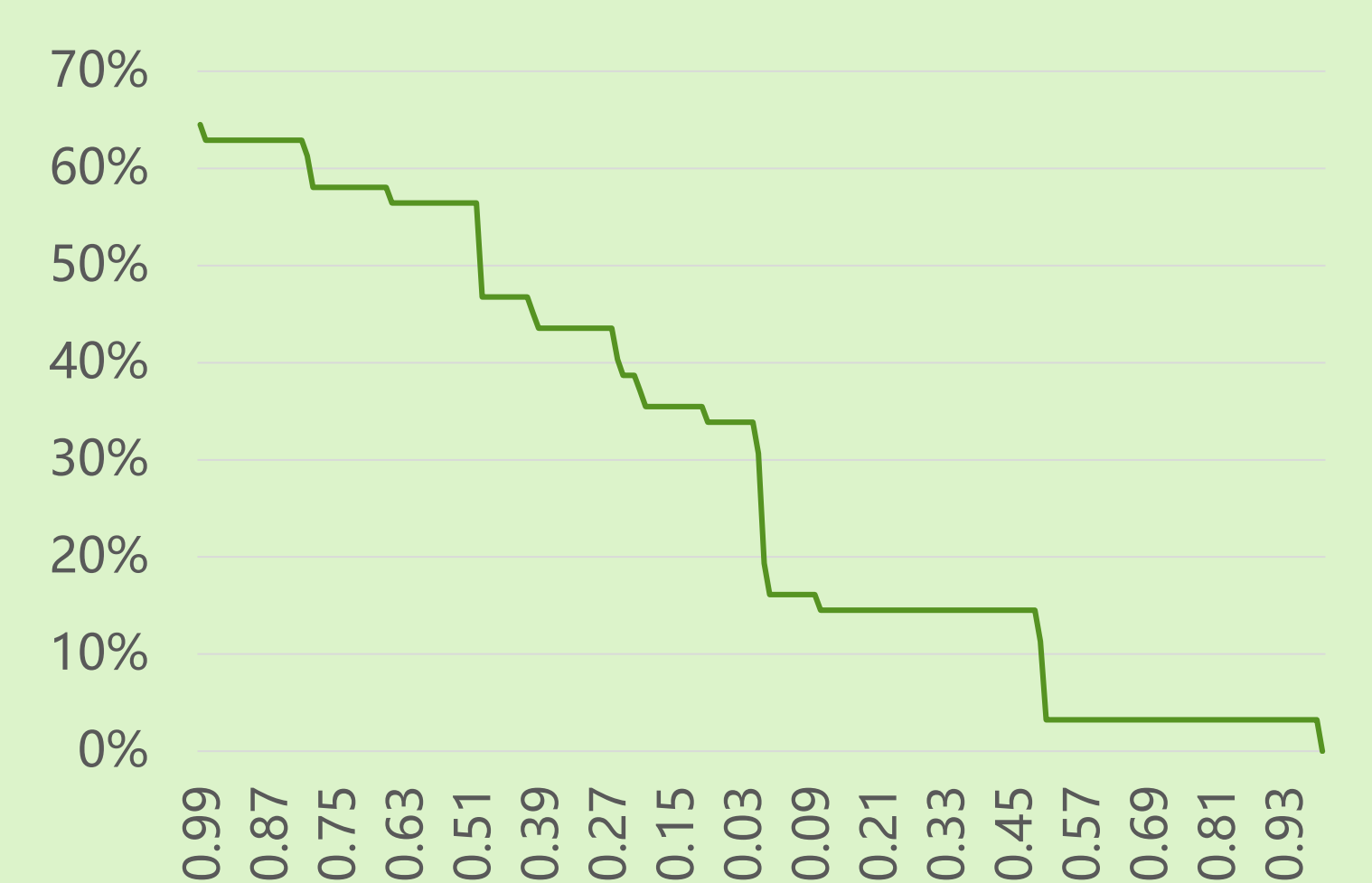
- Consumers preferred the appearance of the California variety, but they did not show significant preference in taste for certain variety
- No significant price premium is shown for the local varieties, both before and after tasting the products

Table 5: Market Share Simulation*

Variables	Baseline*
California variety	17%
NY 1	41%
NY 2	41%

* Based on round 2 bidding (after tasting), treated group; assuming \$1.99/lbs for all varieties

Graph 1: Market Share vs. Price



- The local varieties could gain significant market share if priced at the same level as the California variety

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