Nutrition Information, Nutrition Knowledge and Consumers' Willingness to Pay for Grass-Fed Beef: Empirical Evidence from In-Store Experiments

Presenter: Denise Mainville
Virginia Tech

19th Annual World Forum and Symposium, June 20 - 23, 2009, Budapest, Hungary

Introduction

- Objectives:
  - (1) what are the influential factors that affect consumers' preference for grass-fed beef (GFB)?
  - (2) What's the effect of the provision of nutrition information on consumers' WTP for GFB?
  - (3) To what that consumers' nutrition knowledge can affect their valuation for GFB?
  - (4) What are the determinants of consumers' WTP for GFB?

Experimental Design

- Visual Tests (V)

Lean Meat Color	□ Very pale	□ Pale	□ Pink	□ Neutral	□ Red	□ Dark	□ Very dark
Fat color	□ Very white	□ White	□ Somewhat white	□ Neutral	□ Somewhat yellow	□ Yellow	□ Very yellow
Meat Texture	□ Very fine	□ Fine	□ Somewhat fine	□ Neutral	□ Somewhat coarse	□ Coarse	□ Very coarse
Overall Acceptability	□ Strongly like	□ Like	□ Somewhat like	□ Neutral	□ Somewhat dislike	□ Dislike	□ Strongly dislike

Beef samples: grass-fed and conventional New York Strip steaks

Experimental Design-cont.

- Palatability Tests (P)

Tenderness	□ Very tender	□ Tender	□ Somewhat tender	□ Neutral	□ Somewhat tough	□ Tough	□ Very tough
Juiciness	□ Very juicy	□ Juicy	□ Somewhat juicy	□ Neutral	□ Somewhat dry	□ Dry	□ Very dry
Flavor	□ Very intense	□ Intense	□ Somewhat intense	□ Neutral	□ Somewhat bland	□ Bland	□ Very bland
Overall Acceptability	□ Strongly like	□ Like	□ Somewhat like	□ Neutral	□ Somewhat dislike	□ Dislike	□ Strongly dislike

Beef samples: grass-fed and conventional New York Strip steaks

Experimental Design-cont.

- Information Shock (I)
  - (a) the concentration of natural vitamin E in GFB is 2 - 4 times higher than conventional beef
  - (b) grass-fed cattle incorporate significantly higher amounts of β -carotene into muscle tissues
  - (c) GFB has approximately 60% more Omega-3 fatty acids than conventional beef
  - (d) grass-fed cattle produce 2 to 3 times more CLA than grain-fed cattle

Experimental Design-cont.

- Treatment groups
  - A: V+P
  - B: I+V+P
  - C: V+P+I
- WTP eliciting mechanism:
  - Becker-DeGroot-Marshak (BDM) auction

Results

Consumer Preference for Pasture-Fed Beef / Conventional Beef

Preference		Knoxville(N=141)		Middlesboro(N=161)		Bluefield (N=124)		All Regions	
		Proportion	S.E.	Proportion	S.E.	Proportion	S.E.	Proportion	S.E.
Based on visual test	Pasture-fed beef	0.58	0.04	0.50	0.04	0.58	0.04	0.54	0.02
	Conventional beef	0.36	0.04	0.45	0.04	0.36	0.04	0.41	0.02
	Indifferent	0.06	0.02	0.05	0.02	0.06	0.02	0.05	0.01
Based on palatability test	Pasture-fed beef	0.38	0.04	0.39	0.04	0.35	0.04	0.40	0.02
	Conventional beef	0.59	0.04	0.56	0.04	0.61	0.04	0.56	0.02
	Indifferent	0.03	0.02	0.05	0.02	0.04	0.02	0.04	0.01
Over all	Pasture-fed beef	0.38	0.04	0.40	0.04	0.38	0.04	0.42	0.02
	Conventional beef	0.59	0.04	0.57	0.04	0.57	0.04	0.55	0.02
	Indifferent	0.03	0.01	0.03	0.01	0.05	0.02	0.03	0.01

Results-cont.

Probit Estimates for Consumer Choice Equation

	Coefficients	Std.Err	Marginal Effect	Std.Err
Constant	-0.7417	0.2166		
Dlcolor	-0.0049	0.0784	-0.0016	0.0255
Dfcolor	-0.0208	0.0736	-0.0068	0.0239
Dtexture	0.2397***	0.0622	0.0781	0.0197
DTender	0.6419***	0.0886	0.2090	0.0272
DJuicy	0.4626***	0.0887	0.1506	0.0287
DFlaor	0.3954***	0.0846	0.1287	0.0284
d2	0.6668***	0.2542	0.2244	0.0860
d3	0.4725*	0.2666	0.1618	0.0940
Percentage of correct predictions	89%			

Results-cont.

Tobit Estimates of WTP Equation

Variable	Coefficient	S.E.	Marginal Effects: Unconditional Expected Value	Marginal Effects: Conditional on being Uncensored
Freq	0.56**	0.27	0.18**	0.16**
Disease	1.20**	0.54	0.39**	0.33**
Kf	0.50***	0.17	0.16***	0.14***
Ks	-0.40***	0.15	-0.13***	-0.11***
Dlcolor	0.33*	0.18	0.11*	0.09*
Dtexture	0.26*	0.14	0.08*	0.07*
Dtender	0.58***	0.16	0.19***	0.16***
Djuicy	0.49**	0.22	0.16**	0.14**
Tb*Dlcolor	-0.52**	0.27	-0.17**	-0.14**
Tb*Dfcolor	-0.49**	0.25	-0.16**	-0.14**
Tc*Dlcolor	-0.66**	0.33	-0.21**	-0.18**
Tc*Dflavor	0.92***	0.30	0.30***	0.25***
Single	-1.54***	0.52	-0.50***	-0.43***
Householdsize	-0.25*	0.14	-0.08*	-0.07*
Likelihood-Ratio Test, χ^2	230.86			

Notes: only significant variables are reported.

Conclusion

- Beef products' palatability attributes play a central role in determining consumers' preferences and WTP
- Nutrition knowledge can significantly influence consumers' WTP
- Consumers' awareness of PFB products' positive impact on human health, environment and animal welfare do not necessarily increase their WTP
- Socio-demographic variables play a small role in explaining consumers' behavior