An Analysis of Factors Affecting Consumers' Decisions to Shop at Stores Offering Specialty Meat

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The empirical results suggest that the likelihood of grocery shoppers buying at stores that offer specialty meat is influenced by age, household size, education, ethnicity, and prices but is invariant to geographical location, gender, marital status, religion, occupation, and household income. From these results, a niche market for specialty meat is more likely among grocery shoppers aged 42 or younger, those from households with three persons or less, those without a high school diploma, or non-Caucasians. Price plays an important role in grocery shoppers' decisions to buy at stores offering specialty meat.

Introduction

For almost two decades, agricultural scientists at several 1890 land-grant colleges and universities have been conducting research to find economically viable enterprises for small farmers. Their goal is to find viable alternatives to beef cattle, swine, and row crops. Although new enterprises can potentially diversify production agriculture and enhance farm incomes, their economic success will depend on sound production and marketing practices. Rigorous analyses must be done on the demand for and supply of nontraditional food products before agricultural scientists recommend them to farmers. This strategy is essential because the U.S. food industry is consumer-driven and a high percentage of new products fail.

The ethnically diverse population in the United States and consumers' interest in new and exotic food products have led some researchers to predict that the demand for and supply of these products will remain strong in the future. Their projections include expansions in the selections of frozen exotic meats, frozen armadillo eggs, ostrich meat, shellfish, and seafood (Babb and Long, 1987; Food Distribution Research Society, 1993). Other researchers are less optimistic and predict slower growth rates in food demand over the next two decades (Blisard and Blaylock, 1993; Blaylock and Smallwood, 1986). Regardless of the projections, new and exotic food products will be competing with traditional food products, and both will be vying for a declining consumer food dollar.

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The demand for new and exotic food products reflects consumers' changing demographic, geographic, and socioeconomic (DGS) characteristics and a more responsive food industry (Barkema, Drabenstott, and Cook, 1993; Childs, 1993; Frazao, 1993; Kinsey, 1990; Lutz, Blaylock, and Smallwood, 1993; Lutz et al., 1992; Putnam and Allshouse, 1993; Manchester, 1992; Senauer, Asp, and Kinsey, 1992). Although wider selections of new and exotic food products may suggest consumers' increasing awareness and acceptance of these products, each new product's success still depends on the number of early triers of the product and the time lag between its introduction and purchase by other consumers. Regional differences exist in U.S. food consumption patterns; therefore, aggregate consumption data may not reflect a region's uniqueness. Consequently, market assessments must be done at the regional levels to determine whether behavioral characteristics of early triers of a product at the aggregate level are similar to those at the regional levels. This study is a step in that direction. It examines the decisions of grocery shoppers, in Louisiana and southeast Texas, to shop at stores offering alligator, goat, and/or rabbit meat, and the characteristics of these shoppers.

Objectives

The study's goal is to assess the marketing outlook for alligator, goat, and/or rabbit meat in Louisiana and southeast Texas. The specific objectives are to determine (1) the percentage of grocery shoppers buying at stores offering specialty meat, (2) whether DGS characteristics influence shoppers' likelihood of buying from these outlets, and (3) the profiles of consumers most likely to buy specialty meat. The selected DGS

characteristics for this study are geographic area, gender, age, household size, education, marital status, religion, occupation, ethnicity, and household income. In general, alligator, goat, and rabbit meat cost more per pound than beef, chicken, and pork; therefore, a variable is included to measure whether price is an important factor in grocery shoppers' meat purchasing decisions. The study's findings will provide agricultural scientists and food marketers with information on the characteristics of users and potential users of these products, and will help them to make informed decisions about the demand side of the market and strategies for expanding the consumption of these meats.

The Consumer Survey

Before the survey, the researchers called 10 retail outlets in Baton Rouge to find out if they sold alligator, goat, and/or rabbit meat, and the prices per pound for the three meats. The researchers got the following information: (1) Three supermarkets had small quantities of rabbit meat; (2) two meat shops had goat and rabbit meat for sale; (3) a seafood store carried alligator meat; (4) prices ranged from \$1.79–\$2.79 per pound for goat meat and from \$2.39–\$2.49 per pound for rabbit meat; and (5) alligator meat sold for \$4.99 per pound. The researchers used these findings in designing the survey questions on specialty meat consumption or likely consumption in Louisiana and southeast Texas.

The study's data were collected in February 1993 by a telephone survey of 1,002 randomly selected households in Louisiana and southeast Texas. The interviewers solicited responses from the main grocery shopper in each household. Shoppers' decisions to buy specialty meat were reflected by their responses to the following statement: "I like to shop at stores that offer specialty meat (alligator, goat, and/or rabbit meat)." A five-point scale recorded grocery shoppers' responses as follows: (1) strongly disagree, (2) somewhat disagree, (3) neutral, (4) somewhat agree, and (5) strongly agree. The interviewers further asked respondents to use the scale (1) not at all important, (2) not very important, (3) somewhat important, (4) very important, and (5) extremely important to rank the importance of meat prices in their decisions to buy a particular meat. The survey also collected data on respondents' demographic and socioeconomic characteristics (age, education, ethnicity, gender, household size, income, marital status, occupation, and religion).

Model Specification and Variables

Given the response categories, the dependent variable, *LIKESHOP,* is discrete and ordinal. Ordinary least squares cannot be used to estimate this model because its parameter estimates are bias. The study used the ordered probit model (OPM) to estimate the model and to generate maximum likelihood estimates for the unknown parameters. The OPM is represented as follows:

$$
\begin{aligned}
(1)\qquad & y^* = \beta'X + \varepsilon,\ \varepsilon \sim N[0, 1]; \\
& y = 0 \text{ if } y^* \le 0; \\
& y = 2 \text{ if } 0 < y^* \le \mu_1; \text{ and} \\
& y = 3 \text{ if } \mu_1 < y^* \le \mu_2.
\end{aligned}
$$

The y^* vector is derived from utility theory and is unobserved. The observable y vector represents grocery shoppers' responses on their decisions to shop at stores offering specialty meat. This vector is bounded by y^* and the cut-off utility vector, μ. X is the matrix of DGS characteristics and the importance ranking of meat prices, and β is a vector of unknown parameters. The stochastic error term, ε, is assumed to be normally distributed with a mean of 0 and a standard deviation of 1. For estimation purposes, the following probabilities enter the log-likelihood function:

$$
\begin{aligned}
(2)\quad & \text{Prob}(y = 0) = \Phi(-\beta'X); \\
& \text{Prob}(y = 1) = \Phi(\mu_1 - \beta'X) - \Phi(-\beta'X); \text{ and} \\
& \text{Prob}(y = 2) = \Phi(\mu_2 - \beta'X) - \Phi(\mu_1 - \beta'X).
\end{aligned}
$$

Φ is the cumulative standard normal distribution function, and $\mu s > 0$.

A new product's success depends on the number of early triers of the product and the time lag between introduction and adoption by a majority of consumers. Because the paper deals with shoppers' decisions to buy at stores offering new or exotic meats, it applies an extension of diffusion theory to classify shoppers and to define some of the explanatory variables. From the five response categories, shoppers who strongly agreed with the statement were termed early triers; those who agreed somewhat or were neutral about it were termed late triers; non-triers strongly disagreed or

somewhat disagreed with the statement. The dependent variable reflected these classifications.

The literature suggests that early triers of new products are better educated, have higher household incomes and occupational status, and are younger than late or non-triers. It is inconclusive about the influence of gender, household size, marital status, religion, or ethnicity on new or exotic products' adoption. Therefore, no a priori assumptions are made about the directions of the signs of the coefficients for gender, household size, marital status, religion, or ethnicity. All explanatory variables, except age and household size, are binary.

The OPM calculates the marginal effects of changes in an explanatory variable while holding other explanatory variables at their sample means. In calculating the marginal effects, however, the model regards all the explanatory variables as continuous. This approach can overestimate or underestimate the probabilities. For this study, the marginal effects for the discrete variables with statistically significant coefficients are determined by the differences between the predicted probabilities for each value (0 and 1) of a discrete variable while holding other regressors at their sample means. The predicted probabilities are determined from equation (2). The marginal effects for the continuous variables (age and household size) are determined from the model. The ordered probit modeling procedure in *LIMDEP* 7.0 (Greene, 1995) is used to estimate the model and to generate the maximum likelihood estimates. The explanatory and dependent variables, variable definitions, arithmetic means, and standard deviations are shown in Table 1.

Table 1. Variable Definitions and Summary Statistics.

Variable Definitions	Variable Name	Mean	Standard Deviation
Explanatory Variables			
Geographic Area Louisiana=1; Texas=0	AREA	0.7994	0.4007
Gender Female=1; Male=0	GENDER	0.7487	0.4340
Age	AGE	42.000	2.9139
Household Size	HSIZE	2.8632	1.4610
Education ≥ High School=1; 0 otherwise	EDUC	0.8582	0.3491
Religion Catholics=1; 0 otherwise	CATH	0.3647	0.4816
Marital Status Married=1; 0 otherwise	MARD	0.6606	0.4737
Employment Status White collar=1; 0 otherwise	WCOLL	0.4650	0.4990
Race Caucasians=1; 0 otherwise	WHITE	0.7913	0.4066
Household Income ≥ 50,000=1; 0 otherwise	INC	0.1986	0.3991
Price per pound Somewhat important, Very important, and Extremely important=1; 0 otherwise	IMPRICE	0.8419	0.3650
Dependent Variable			
Decisions to shop at stores offering specialty meat 0=Non-Triers; 1=Late Triers; 2=Early Triers	LIKESHOP	1.1895	0.9005

Descriptive Statistics

About 80 percent of the respondents were Louisiana residents. Almost 75 percent of the grocery shoppers were women. The average age and household size were 42 years and three persons, respectively. About 86 percent of the respondents had a high-school level of education or above while 36 percent were Catholics. Most of the grocery shoppers were married (66 percent), and 79 percent were Caucasians. Forty-seven percent held white-collar jobs (professionals, administrators, salespersons, secretaries). About 20 percent of the respondents had household incomes of at least $50,000. Meat prices were important determinants in shoppers' decisions to buy from stores that offered specialty meat. Overall, respondents appeared willing to shop at stores offering specialty meat (Table 1).

Fifteen percent of grocery shoppers strongly disagreed that they liked to shop at stores offering specialty meats; 18 percent disagreed somewhat; and 15 percent were neutral. Thirty-two percent of the grocery shoppers could be termed early triers of specialty meat, and 20 percent were late triers. These findings suggested that 52 percent of grocery shoppers in the study region had shopped at stores offering specialty meat (Table 2).

Table 2. Decisions to Shop at Stores Offering Specialty Meat by Response Categories.

Response Categories	Percentages
Strongly Disagree	15
Somewhat Disagree	18
Neutral	15
Somewhat Agree	20
Strongly Agree	32

Empirical Results

The estimated coefficients, asymptotic t-ratios, standard errors, chi-square value, and other goodness-of-fit measures from the OPM are shown in Table 3. The model's chi-square value (with 11 degrees of freedom) is statistically significant and implies that the null hypothesis that all the ßs are equal to zero is rejected. The positive and statistically significant coefficient for μ_1 confirms that the response categories are ordered. The model predicts 53 percent of the responses correctly. Five of the 11 regressors have statistically significant coefficients at the 10 percent level of probability or better. Thus, the likelihood of grocery shoppers buying at stores offering the three specialty meats is influenced by age, household size, education, ethnicity, and prices. Conversely, the probability of shopping at these stores is invariant to geographic location, gender, marital status, religion, occupation, and household income.

Because of the difficulties involved in interpreting coefficients from the OPM, Greene (1993) cautions when using them to make inferences. The predicted and marginal effects give a better picture of the relationships between the dependent and independent variables. The predicted and marginal effects for the variables with statistically significant coefficients are shown in Table 4. From the table, a 42-year-old grocery shopper or a shopper from a three-person household is more likely to shop at stores offering specialty meat than an older shopper or one from a larger household. Grocery shoppers with less than a high-school level of education are 18 percentage points more likely to go to these stores than those with higher levels of education are. The study's results for age are consistent with the literature. Early triers are younger than late triers or non-triers of the products. The findings for education are not as hypothesized. Lesser educated shoppers are more likely to shop at stores offering specialty meat than more educated shoppers. Caucasians are less likely to shop at these stores than non-Caucasians are.

Price is an important consideration in grocery shoppers' decisions to buy from stores offering specialty meat. In fact, there is a 22-percentage-point difference between early triers and non-triers of specialty meat on the importance of prices to their meat-purchasing decisions. This finding should be of some concern to scientists researching specialty meat because prices for alligator, goat, and/or rabbit meat tend to be higher than those for traditional meats are. The three meats' prices are comparable to those for choice cuts of beef and pork, and for boneless and skinless chicken and turkey breast fillets. Based on prices, potential consumers of specialty meat may be found among those buying choice cuts of beef and pork, and/or boneless and skinless chicken and turkey breast fillets.

Table 3. Regression Estimates for Decisions to Shop at Stores Offering Specialty Meats. [a]

Variable	Estimated Coefficient	Asymptotic *t*-ratio	Standard Error
CONSTANT	1.0602***	4.942	0.2145
AREA	0.1020	1.041	0.0980
GENDER	0.0161	0.171	0.0942
AGE	-0.0495***	-3.355	0.0148
HSIZE	-0.0632**	-2.055	0.0307
EDUC	-0.4632***	-3.964	0.1168
MARD	0.0833	0.911	0.0914
CATH	-0.0290	-0.359	0.0808
WCOLL	0.0003	0.004	0.0858
WHITE	-0.1887*	-1.869	0.1010
INC	0.0907	0.856	0.1059
IMPRICE	0.2923***	2.741	0.1066
μ_1	0.4115***	13.856	0.0311

[a] *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively.

Other Statistics: Log likelihood = -962.19; Log likelihood restricted = -981.66; Model Chi-Square (11) = 38.95***; Percentage Correctly Predicted = 53.

Table 4. Predicted Probabilities and Marginal Effects (Change) by Response Categories.

Variable	Categories		
	Non-Triers Prob (y=0)	Late Triers Prob (y=1)	Early Triers Prob (y=2)
Age			
AGE = mean	0.3228	0.1612	0.5160
AGE = mean + 1	0.3409	0.1591	0.5000
Change	0.0181	-0.0021	-0.0160
Household Size			
HSIZE = mean	0.3228	0.1612	0.5160
HSIZE = mean + 1	0.3483	0.1597	0.4920
Change	0.0255	-0.0015	-0.0242
Education			
EDUC = 0	0.0977	0.2323	0.6700
EDUC = 1	0.3483	0.1597	0.4920
Change	0.2506	-0.0726	-0.1780
Ethnicity			
WHITE = 0	0.2709	0.1538	0.5753
WHITE = 1	0.3372	0.1588	0.5040
Change	0.0663	0.0050	-0.0713
Price			
IMPRICE = 0	0.4168	0.1625	0.4207
IMPRICE = 1	0.3185	0.1456	0.5359
Change	-0.0983	-0.0169	0.1152

Summary and Conclusions

For almost two decades, some agricultural scientists have been conducting research on nontraditional crops and livestock. Much of this effort has been directed toward finding economically viable enterprises for small farmers. The research has focused on small animals as replacements for cattle and swine, and on agronomic crops as possible substitutes for row crops. Marketing is a key element of economic viability; therefore, farmers must be able to sell the products that they produce. On the demand side, American consumers are more diverse than they were previously, and many have shown some willingness to try nontraditional food products, including specialty meat.

Food has an inelastic demand; therefore, food consumption changes less than proportionately to changes in real income. Further, researchers are predicting slower growth in food demand for the next decade. Because of these factors, nontraditional food products will be competing for market shares during a period when food expenditures are expected to decline. Carefully done market assessment studies will be needed before the introduction of new food products. These assessments must involve all aspects of food delivery and consumption. On that premise, this study assessed factors influencing grocery shoppers' decisions to buy alligator, rabbit, and/or alligator meat at stores offering these meats. The OPM estimated how the selected DGS characteristics influenced the probability of grocery shoppers' purchasing decisions. The results further suggested that shoppers' likelihood of buying at stores offering specialty meat was influenced by age, household size, education, ethnicity, and prices but was invariant to geographical location, gender, marital status, religion, occupation, and household income. A niche market for the meats is more likely among consumers and 42 years or younger, those from smaller households, those with less than a high-school level of education, or among non-Caucasians.

Specialty meat is more likely to be sold through nontraditional outlets than by supermarket chains. The challenges for agricultural scientists researching nontraditional meat are (1) how to get specialty meat into traditional retail outlets and (2) how to increase consumer awareness and acceptance of specialty meat. One solution may be for agricultural scientists to collaborate with food scientists and nutritionists to determine whether the selected meats have desirable nutritional attributes and/or whether they can be processed in other forms such as roasts, patties, or nuggets. These collaborative efforts also may lead to the discovery of new recipes for preparing the meats. If new forms of the meats were developed and sensory analyses prove favorable, researchers may be able to persuade food retailers to offer grocery shoppers cooked samples of these meats and/or recipes for preparing them. These strategies may increase consumers' awareness and consumption of the meats. However, for sustained consumption and market success, the meats must be priced competitively.

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