# Consumer Choice Among Alternative Red Meats

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A multinomial logit model was estimated and used to analyze consumer choice between the best retail meat cut from four species of alternative livestock or "none of these" (all with equal retail prices). The data source, a 1997 survey of Louisiana households, included buffalo, emu, ostrich, and venison. The following were important variables in the respondents' selection among species of alternative livestock: sex, education and race of the respondent; previous consumption of meat from exotic animals; and respondent identification of venison as an exotic meat. The respondents also indicated some resistance to consuming meat from animals that they considered to be exotic. These results infer that producers and sellers of meat from exotic animals will have to overcome these perceptions to move their product beyond niche markets.

## Introduction

As interest in producing alternative livestock has increased in recent years, a number of new, alternative meats have been introduced into the supermarket meat case. Some examples include venison, buffalo, ostrich, and emu. As with many new food items, the markets for these meats have been confined to niches, perhaps as a result of both supply and demand limitations. How do consumers perceive these meats—are they perceived as "exotic"? If so, might the exotic label discourage consumers from purchasing them? What types of alternative meat are currently the most likely to be chosen by consumers? In this paper, we attempt to answer these questions, examining issues that have been widely discussed, yet narrowly researched, in the agricultural economics profession.

For the individual consumer, a subset of alternative meats is often defined according to its source—exotic animals (Gillespie, Schupp, and Taylor). "Exotic" is defined by The American Heritage Dictionary as "from another part of the world; not indigenous; foreign; having the charm of the unfamiliar; strikingly and intriguingly unusual or beautiful." A more workable definition for an exotic product, specifically that of an exotic animal, is "zoolike" or "unusual for the purpose considered." Given that individuals differ widely in their familiarity with animals and their use for food, a

given animal could be classified as exotic by one individual and traditional by another. The list of alternative or nontraditional animals being raised specifically for the production of meat and other consumer products has been expanding, increasing consumer exposure to unfamiliar meat products. For example, in 1997, Louisiana had 32 producers raising deer, llama, and antelope, and 512 producers involved in ratite production (Louisiana Cooperative Extension Service, 1997).

Previous research (Gillespie, Schupp, and Taylor, 1997)—which examined the consumption of ratite meat (that is, emu and ostrich)—has raised the issue of exotic meats. This research indicates that a number of respondents would not consume ratite meats because they consider the source animals to be exotic. Surveyed handlers of ratite meats reported little demand for the product in either grocery stores or restaurants. This resistance could be difficult to overcome, thus imposing limits on the potential market for these meats. Gillespie, Schupp, and Taylor do not attempt to define the characteristics of exotic animals, to determine why consumers considered ratites to be exotic, or to ascertain why meat from exotic animals is not on consumers' acceptable list.

Of the 10 food trends identified by Faith Popcorn for the Food Marketing Institute as affecting consumer preference, one is adventure (Senauer, Asp, and Kinsey, 1991). The need for adventure is expressed as a desire for new tastes and foods and for variety at a relatively low risk. This increased desire for adventure is influenced by a population that is increasingly diverse and wealthy, thus having more extensive travel experience. The population includes individuals who are "searching for satisfying alternatives to old food habits" (Senauer, Asp, and Kinsey, 1991, p.59). If "adventure" is indeed a trend in food consumption, alternative meats will

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likely fill a niche, especially if these alternatives are considered safe and desirable.

This study examines the consumer's choice among the best meat cut of four alternative animal species, plus the option to abstain from the purchase of meat from any of the four species. The four species selected—deer, buffalo, emu, and ostrich—produce red meat and are potential competitors of the traditional red meat species, such as beef, pork, and veal. Consumers were asked whether they considered any of these four species of meats to be derived from an exotic animal and whether they ate meat from exotic animals. The willingness of consumers to purchase and consume meat from animals is likely influenced by their familiarity with the animal for food purposes. If a given individual does not perceive a specific species of animal as appropriate for use as human food, s/he will choose from among other available species. Besides the Gillespie, Schupp and Taylor study, the authors could locate no published information on these issues.

In this study, the authors propose the following relationships:

- A higher proportion of Louisiana consumers will choose venison (deer) over the remaining three alternative meats. This hypothesis is based on Louisiana residents' familiarity with venison from recreational hunting.

- Venison and buffalo will be defined as "exotic" by fewer respondents than will emu and ostrich. This is due to the fact that venison and buffalo are indigenous to North America while emu and ostrich are not.

- The respondents' designation of a specific species of animal as exotic will impact their decisions to purchase meat from that specific species. This hypothesis is based on the preliminary work of Gillespie, Schupp, and Taylor (1997).

- Consumer purchase choice from among the four species of alternative livestock and identification of specific species (buffalo, venison, emu, and ostrich) as exotic will differ by the socioeconomic characteristics of the respondent. This hypothe-

sis is based on previous research that shows the relationship of these characteristics to consumer purchase decisions (for example, Nayga, 1997; Nayga, 1996; Lin, 1995).

## Data and Methods

In 1997, 3,180 randomly selected Louisiana households in four randomly selected rural and four randomly selected urban parishes were surveyed by mail. Respondents answered questions about their choices of meats and provided socioeconomic information as part of a fresh meat survey. The design and distribution of the questionnaire followed Dillman's (1978, 1991) survey design. Approximately 20 percent of the surveys were returned. The data were analyzed using multinomial logit and tabular methods. The following question was asked in the survey: "If given a choice of the best retail cut from the following kinds of fresh meats at equal prices, which (one) would you buy?" The choices were buffalo, venison, emu, ostrich, and "none of these." An appropriate framework for analyzing the effect of independent variables on choice, when there are a finite number of choices greater than two, is multinomial logit estimation—which has been used widely in recent years by agricultural economists such as Caffey and Kazmierczak, 1998; Luzar et al., 1998; Moutou and Brester, 1998; and Zepeda, 1990. Using multinomial logit, the probability of the $i$th individual's choice of the $j$th meat is assumed to follow a logistic distribution as in equation (1):

$$(1) \qquad P_{ij} = \frac{e^{x_i'\beta_j}}{1 + \sum_{k=1}^{m-1} e^{x_i'\beta_k}}, j = 1, 2, \ldots, m-1,$$

where X is the set of socioeconomic characteristics associated with the individual, b is the set of estimated parameters describing the influence of X on the probability of choosing meat j, and m is the number of choices. The reader is referred to Maddala (1983) for a more rigorous exposition of the multinomial logit model.

Marginal probabilities of choice (that is, the marginal effects) were calculated from the multinomial logit results employing the following formulation:

$$(2) \quad \frac{\partial P_j}{\partial x_i} = P_j(\beta_j - \sum_{i=1}^{m} P_i \beta_i), \, j = 1, 2, \ldots, m.$$

The marginal effects are partial derivatives of probabilities with respect to the vector of characteristics and are needed since parameter estimates b do not allow for direct determination of the marginal effects in multinomial logit models.

Variables that are hypothesized to influence the choice of meats are defined in Table 1. This research is exploratory in nature; there is little previous research to help in formulating hypotheses on the effect of many of the independent variables on the dependent variable. Thus, the effects of most of the socioeconomic variables on choice of meats were considered to be indeterminate a priori. It is hypothesized that rural residents are more likely to choose venison than they are to choose "none of these" since hunting is a

popular activity, especially among rural residents. It is hypothesized that higher income individuals are more likely to choose buffalo or ostrich since they are more likely to have had previous experiences with these meats in higher-priced restaurants and are more likely to have had more extensive travel experience. Those respondents who have consumed exotic meat in the past are hypothesized to choose any of the meats over "none of these." The variables asking respondents to answer whether they consider each of the four meats to be exotic are hypothesized to affect meat choice. Given previous research by Gillespie, Schupp, and Taylor, it is hypothesized that a meat is less likely to be chosen by the respondent if it is considered to be exotic. Likewise, a meat that is not considered to be exotic will likely be substituted for the meat that is considered exotic. The multinomial logit model is run using LIMDEP.

**Table 1. Independent Variables Used in the Multinomial Logit Analyses, Louisiana, 1997.**

| Variable | Definition |
|---|---|
| Sex | Respondent is Female = 1; Male = 0 |
| Age | Continuous variable |
| Edu 1 | Less than high school = 1; Otherwise = 0; Base=Graduate Degree |
| Edu 2 | High school = 1; Otherwise = 0; Base=Graduate Degree |
| Edu 3 | Trade school = 1; Otherwise = 0; Base=Graduate Degree |
| Edu 4 | Some college = 1; Otherwise = 0; Base=Graduate Degree |
| Edu 5 | College degree = 1; Otherwise = 0; Base=Graduate Degree |
| Unemployed | Unemployed = 1; Otherwise = 0 |
| Retired | Retired = 1; Otherwise = 0 |
| White | White = 1; Otherwise = 0 |
| Town | Population 2,500 to 100,000 = 1; Otherwise = 0; Base=Rural Area |
| City | Population 100,000 or greater = 1; Otherwise = 0; Base=Rural Area |
| Lo Inc | Family income less than $15,000 = 1; Otherwise = 0; Base=$15,000<income<$60,000. |
| Hi Inc | Family income greater than $60,000 = 1; Otherwise = 0; Base=$15,000<income<$60,000. |
| Single | Household head is single = 1; Otherwise = 0 |
| Child | One or more children present in household = 1; Otherwise = 0 |
| Eat Exo | Have consumed exotic meat = 1; Otherwise = 0 |
| Buff Ex | Consider buffalo exotic = 1; Otherwise = 0 |
| Emu Ex | Consider emu exotic = 1; Otherwise = 0 |
| Ostr Ex | Consider ostrich exotic = 1; Otherwise = 0 |
| Veni Ex | Consider venison exotic = 1; Otherwise = 0 |

## Results

The typical respondent to the questionnaire was female, a member of a two- to three-person household, a high school graduate with some college credit, gainfully employed, white, and a resident of a rural or small town area with an average household income of approximately $42,000. While the responding sample is somewhat biased toward the white, higher-educated, or higher-income portions of the Louisiana population, this bias is typical of unstructured mail surveys.

The proportions of respondents that chose to purchase a specific species of meat from the four alternative livestock choices are given in Table 2. Eight percent of the respondents chose buffalo; 8.5 percent selected emu; 5.2 percent selected ostrich; and 41.4 percent selected venison. The second most popular choice (36.9 percent) was "none of these." In particular, these results indicate that venison is more acceptable to Louisiana consumers, perhaps because of its familiarity as an indigenous species. These results also indicate that the ratite industry has some room for improvement in educating households about the positive attributes of ratite meat.

Almost two-thirds of the respondents (63.6 percent) indicated that they did not eat meat from animals that they considered to be exotic. A smaller percentage (22.3 percent) indicated that they had eaten meat from animals that they considered to be exotic. The response of the remaining 14.1 percent ("don't know") likely indicates that they had not firmly established in their minds criteria by which to determine whether an animal was exotic. These results point to a possible resistance among Louisiana consumers to the consumption of meat from animals that they consider to be exotic. Further research is needed to ascertain how consumers define exotic livestock species and to identify the characteristics of exotic animals.

Respondents who reported the previous consumption of meat from animals that they classified as exotic also identified the animals (Table 3). Deer, alligator, emu, buffalo, wild duck (goose), ostrich, and rabbit were each listed by 10 or more respondents. Snake, elk, quail, turtle, raccoon, shark, and wild pig were reported by five to nine respondents. The remaining animals were listed by three or fewer respondents. Hence, there appears to be a number of species that a significant proportion of consumers have both eaten and classify as exotic.

The respondents indicated whether they classified buffalo, emu, ostrich, or deer meat as derivations of an exotic animal. Eighty-seven percent identified ostrich as exotic; 83 percent identified emu; and 62 percent identified buffalo. Only 31 percent identified venison as a derivation of an exotic animal. The familiarity of Louisiana residents with deer (venison) likely explains the low percentage of consumers who classified venison as a derivation of an exotic animal. The smaller percentage of respondents who identified buffalo as exotic may be attributed to the fact that buffalo is a native species of North America while emu and ostrich are not.

**Table 2. Proportion of Respondents Who Chose the Best Cut of Selected Species of Alternative Fresh Meats at Equal Prices, Louisiana, 1997.**

| Species | Percentage |
|---|---|
| Buffalo | 8.0 |
| Emu | 8.5 |
| Ostrich | 5.2 |
| Venison | 41.4 |
| None of these | 36.9 |

**Table 3. Specific Animal Species—Which Respondent Considered to be Exotic—Reported to Have Been Consumed in Louisiana Households, 1997.**

| Species of Animal | Consuming Households |
|---|---|
| Deer (Venison) | 78 |
| Alligator | 38 |
| Emu | 23 |
| Buffalo | 20 |
| Wild Duck (Goose) | 17 |
| Ostrich and Rabbit | 16 |
| Snake | 9 |
| Elk and Quail | 8 |
| Turtle and Raccoon | 6 |
| Shark and Wild Pig | 5 |
| Dove, Squirrel, Bear, Pheasant, Wild Turkey, and Frog | 3 |
| Nutria, Snail, Moose, and Possum | 2 |
| Goat, Crocodile, Antelope, Iguana, Dog, Armadillo, Horse, and Bobcat | 1 |

Results of the multinomial logit analysis of respondent choice are provided in Table 4. Whereas Table 4 indicates those variables that are statistically significant at the 0.20 level or better (this low level of significance chosen because of the exploratory nature of this research), only those relationships at the 0.10 level or lower will be discussed. Those individuals who had eaten meats that they consider exotic in the past were more likely to choose all of the meats over "none of these." Perhaps this indicates that previous experience with exotic meats lessens the aversion to trying alternative meats, or perhaps these individuals are more adventurous and thus more likely to try new and different foods. Female respondents were less likely to choose buffalo, ostrich, or venison than they were to choose "none of these" and less likely to choose ostrich over venison. The lesser willingness of females to choose any of the meats is supported by the marginal probabilities (Table 5). Older respondents were more likely to choose ostrich over "none of these" or to choose ostrich over venison. White respondents were more likely than non-white respondents to choose buffalo or venison over "none of these." Retired respondents were more likely to choose emu and less likely to choose ostrich over none of these. The retired respondent was also more likely to choose emu over buffalo and less likely to choose ostrich over venison or ostrich over emu. The reasons are unclear as to why retired persons tended to favor emu, but not ostrich, over other meats.

Respondents with an educational level of high school or below or with a college degree were more likely than those with a graduate degree were to choose venison over "none of these." Those with an education level of high school through some college were more likely than those with graduate degrees were to choose emu over "none of these." Respondents with some college were less likely than those with graduate degrees were to choose ostrich over "none of these." Respondents with a high school education were more likely than those with graduate degrees were to choose venison and emu over buffalo. Respondents with some college were less likely than those with graduate degrees were to choose ostrich over buffalo or more likely to choose emu over venison. Respondents with a high school diploma, some college, or a college degree were less likely than those with a graduate degree were to choose ostrich over venison, and respondents with

an education level of high school through some college were less likely to choose ostrich over emu. Overall, it appears that individuals without graduate degrees were more likely than those with graduate degrees were to choose emu and ostrich over "none of these."

Respondents with children were more likely to choose buffalo over "none of these." Respondents living in towns (populations of 5,000 to 100,000) were more likely than rural residents were to choose ostrich over venison or ostrich over emu. Respondents living in a city (population of 100,000 or more) were more likely than rural residents were to choose ostrich over emu. The increased probability that urban consumers prefer ostrich over venison is not surprising since fewer urban residents are likely to be hunters. The increased probability of choosing ostrich over emu by urban residents can likely be attributed to two factors: (1) Ostrich meat has been distributed in more retail and restaurant outlets in urban areas of Louisiana than emu has, and (2) more emus than ostriches have been raised in Louisiana; thus, perhaps rural persons are more familiar with emu (Gillespie, Schupp, and Taylor, 1997 ).

Low-income respondents (family income of $15,000 or less) were more likely than middle-income respondents to choose buffalo over "none of these" or less likely to choose emu over buffalo. High-income respondents (family income of $60,000 or more) were more likely to choose ostrich over emu meat. This is likely the result of increased familiarity with ostrich among wealthy consumers because of its greater distribution in upscale restaurants and retail outlets.

Respondents with previous experience in consuming meats that they considered exotic were more likely to choose buffalo, venison, emu, or ostrich over "none of these." This result is consistent with the hypothesis that those who have experienced exotic meats in the past will be more open to trying other exotic meats. These respondents were also more likely to chose venison over buffalo.

Respondents who classified venison as an exotic meat were less likely to choose venison or ostrich over "none of these." They were also less likely to choose ostrich over buffalo or ostrich over emu. Respondents who classified buffalo as an exotic meat were more likely to choose emu over buffalo. These results tend to confirm that, if a meat is perceived as exotic, it is less likely to be chosen for consumption.

**Table 4. Estimates of the Multinomial Logit Model, Alternative Red Meats, Louisiana, 1998.**

| Variable | Mean | Buffalo vs. None | | Venison vs. None | | Emu vs. None | | Ostrich vs. None | | Venison vs. Buffalo | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coeff. | Prob. | Coeff. | Prob. | Coeff. | Prob. | Coeff. | Prob. | Coeff. | Prob. |
| Constant | | -3.609 | 0.023 | 0.570 | | -3.814 | 0.035 | -0.834 | | 4.178 | 0.008 |
| Eat Exotic? | 0.212 | 1.547 | 0.004 | 1.815 | 0.000 | 2.490 | 0.000 | 2.397 | 0.000 | 0.268 | |
| Sex | 0.713 | -1.354 | 0.004 | -0.626 | 0.040 | -0.670 | 0.171 | -1.594 | 0.004 | 0.728 | 0.108 |
| Age | 47.180 | 0.006 | | -0.032 | 0.005 | -0.023 | | 0.015 | | -0.038 | 0.047 |
| No High Sch | 0.049 | -0.370 | | 2.008 | 0.007 | -8.633 | | -11.935 | | 2.378 | 0.072 |
| High School | 0.308 | 0.180 | | 1.454 | 0.004 | 3.076 | 0.009 | -0.269 | | 1.274 | 0.092 |
| Trade School | 0.078 | 0.160 | | 0.973 | 0.118 | 2.342 | 0.072 | -0.416 | | 0.814 | |
| Some College | 0.280 | 0.429 | | 0.782 | 0.102 | 2.792 | 0.014 | -1.799 | 0.044 | 0.354 | |
| College Degr | 0.167 | -0.069 | | 1.067 | 0.029 | 0.924 | | -1.363 | 0.147 | 1.136 | 0.128 |
| Unemployed | 0.021 | -11.325 | | 0.136 | | -10.495 | | 0.544 | | -11.354 | |
| Retired | 0.209 | -0.742 | | 0.339 | | 1.324 | 0.059 | -1.798 | 0.078 | 1.081 | 0.148 |
| White | 0.842 | 1.991 | 0.016 | 1.138 | 0.004 | 1.188 | 0.168 | 1.400 | 0.121 | -0.852 | |
| Town | 0.217 | -0.032 | | 0.325 | | -0.892 | 0.124 | 0.907 | 0.196 | -0.294 | |
| City | 0.360 | -0.224 | | -0.072 | | -0.691 | 0.181 | 0.907 | 0.167 | 0.152 | |
| Low Income | 0.167 | 1.208 | 0.071 | 0.545 | 0.174 | -0.490 | | 1.165 | 0.152 | -0.662 | |
| High Income | 0.238 | 0.176 | | -0.040 | | 0.531 | | -0.904 | | -0.216 | |
| Homemaker | 0.193 | -0.206 | | -0.250 | | -0.268 | | -1.176 | | -0.044 | |
| Single | 0.238 | -0.265 | | -0.011 | | -0.805 | | -0.090 | | 0.254 | |
| Child | 0.461 | 0.816 | 0.096 | 0.253 | | 0.520 | | 0.034 | | -0.563 | |
| Buffalo Exotic | 0.605 | -0.777 | 0.104 | -0.267 | | 0.215 | | -0.434 | | 0.511 | |
| Venison Exotic | 0.301 | 0.567 | | -0.834 | 0.008 | -0.319 | | -2.295 | 0.004 | -1.401 | 0.005 |
| Emu Exotic | 0.835 | 0.205 | | -0.219 | | 0.462 | | -0.811 | | -0.424 | |
| Ostrich Exotic | 0.880 | 0.342 | | -0.328 | | -0.526 | | -0.544 | | -0.669 | |

**Table 4. Estimates of the Multinomial Logit Model, Alternative Red Meats, Louisiana, 1998 (continued).**

| Variable | Mean | Emu vs. Buffalo | | Ostrich vs. Buffalo | | Emu vs. Venison | | Ostrich vs. Venison | | Ostrich vs. Emu | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coeff. | Prob. | Coeff. | Prob. | Coeff. | Prob. | Coeff. | Prob. | Coeff. | Prob. |
| Constant | | -0.205 | | 2.775 | | -4.384 | 0.013 | -1.404 | | 2.980 | |
| Eat Exotic? | 0.212 | 0.943 | 0.134 | 0.850 | | 0.675 | 0.175 | 0.582 | | -0.094 | |
| Sex | 0.713 | 0.654 | | -0.240 | | -0.073 | | -0.968 | 0.073 | -0.894 | 0.192 |
| Age | 47.180 | -0.029 | | 0.009 | | 0.009 | | 0.047 | 0.043 | 0.023 | |
| No High Sch | 0.049 | -8.272 | | -11.541 | | -11.190 | | -14.484 | | -3.289 | |
| High School | 0.308 | 2.896 | 0.024 | -0.449 | | 1.622 | 0.164 | -1.723 | 0.037 | -3.345 | 0.013 |
| Trade School | 0.078 | 2.182 | 0.125 | -0.575 | | 1.368 | | -1.389 | 0.171 | -2.757 | 0.070 |
| Some College | 0.280 | 2.363 | 0.051 | -2.227 | 0.028 | 2.010 | 0.077 | -2.581 | 0.004 | -4.591 | 0.001 |
| College Degr | 0.167 | 0.993 | | -1.294 | | -0.143 | | -2.430 | 0.010 | -2.287 | 0.138 |
| Unemployed | 0.021 | 0.835 | | 11.761 | | -10.600 | | 0.408 | | 10.903 | |
| Retired | 0.209 | 2.066 | 0.026 | -1.056 | | 0.985 | 0.149 | -2.137 | 0.035 | -3.121 | 0.007 |
| White | 0.842 | -0.802 | | -0.590 | | 0.050 | | 0.262 | | 0.212 | |
| Town | 0.217 | -0.861 | | 0.948 | | -0.567 | | 1.242 | 0.074 | 1.809 | 0.034 |
| City | 0.360 | -0.468 | | 1.131 | 0.133 | -0.620 | | 0.979 | 0.127 | 1.598 | 0.038 |
| Low Income | 0.167 | -1.698 | 0.064 | -0.043 | | -1.035 | 0.171 | 0.620 | | 1.655 | 0.112 |
| High Income | 0.238 | 0.355 | | -1.080 | 0.188 | 0.571 | | -0.865 | | -1.435 | 0.087 |
| Homemaker | 0.193 | -0.062 | | -0.970 | | -0.018 | | -0.926 | | -0.908 | |
| Single | 0.238 | -0.540 | | 0.175 | | -0.794 | | -0.080 | | 0.715 | |
| Child | 0.461 | -0.295 | | -0.781 | | 0.267 | | -0.219 | | -0.486 | |
| Buffalo Exotic | 0.605 | 0.992 | 0.095 | 0.344 | | 0.481 | | -0.167 | | -0.648 | |
| Venison Exotic | 0.301 | -0.886 | 0.164 | -2.861 | 0.001 | 0.515 | | 0.834 | 0.008 | -1.975 | 0.025 |
| Emu Exotic | 0.835 | 0.257 | | -1.017 | | 0.681 | | -0.592 | | -1.274 | 0.178 |
| Ostrich Exotic | 0.880 | -0.868 | | -0.885 | | -0.198 | | -0.216 | | -0.018 | |

**Table 5. Partial Derivatives of Probabilities with Respect to the Vector of Characteristics.**

| Variable | Buffalo | Venison | Emu | Ostrich | None |
|---|---|---|---|---|---|
| Eat Exotic? | 0.026 | 0.354 | 0.040 | 0.021 | 0.440 |
| Sex | -0.054 | -0.094 | -0.008 | -0.018 | 0.174 |
| Age | 0.001 | -0.008 | 0.000 | 0.000 | 0.006 |
| No High Sch | -0.053 | 0.732 | -0.265 | -0.199 | -0.215 |
| High School | -0.037 | 0.316 | -0.065 | -0.017 | -0.327 |
| Trade School | -0.023 | 0.208 | 0.052 | -0.015 | -0.221 |
| Some College | -0.022 | 0.157 | 0.067 | 0.036 | -0.186 |
| College Degr | -0.035 | 0.266 | 0.011 | -0.030 | -0.212 |
| Unemployed | -0.610 | 0.511 | -0.278 | 0.023 | 0.354 |
| Retired | -0.051 | 0.102 | 0.034 | -0.031 | -0.054 |
| White | 0.073 | 0.198 | 0.013 | 0.011 | -0.295 |
| Town | 0.008 | -0.075 | -0.021 | 0.017 | 0.070 |
| City | -0.010 | -0.009 | -0.018 | 0.015 | 0.022 |
| Low Income | 0.050 | 0.099 | -0.024 | 0.013 | -0.138 |
| High Income | 0.011 | -0.016 | 0.016 | -0.014 | 0.003 |
| Homemaker | -0.003 | -0.043 | -0.003 | -0.016 | 0.065 |
| Single | -0.013 | 0.017 | -0.022 | -0.001 | 0.018 |
| Child | 0.037 | 0.032 | 0.010 | -0.002 | -0.075 |
| Buff Exotic | -0.035 | -0.044 | 0.011 | -0.004 | 0.071 |
| Venis Exotic | 0.058 | -0.202 | 0.003 | -0.030 | 0.171 |
| Emu Exotic | 0.018 | -0.061 | 0.016 | -0.011 | 0.038 |
| Ostrich Exotic | 0.058 | -0.080 | -0.010 | -0.006 | 0.067 |

N=425; chi-squared=183.72** (88 df); log likelihood=-459.53; log likelihood restricted=-551.40; Pseudo R-Square=0.30.

## Implications

Until recently, a number of meat-type animals (such as alligator, buffalo, deer, emu, and ostrich) existed in the United States only in the wild or in zoos or animal preserves. More recently, increasing numbers of producers have begun to raise these animals for meat and other products. Retailers of meat from these animals usually must market the meat at premium prices to cover their higher costs of produc-

tion. Handlers of ratite meats today face difficulty in getting consumers to try these products as their prices and availabilities are not favorable to the mass market. Results of this study support the hypothesis that the "exotic" label is also partially responsible for consumers' lack of interest in these meats.

These results tend to confirm the difficulty that producers and handlers of meat from so-called exotic animals face in marketing their products. Sellers of meat from exotic animals will have to

overcome the negative perceptions toward exotic meats if they are to move their products beyond niche markets. Additional research is needed to determine why consumers consider exotic meat to be undesirable for human use and how this problem might be resolved. Sellers could find that habit and tradition are hard to dispel in the short run, particularly since the total supply of meat in the next few years may be near an all-time high.

There may be as many definitions of exotic, in reference to animals, as there are consumers to define them. The term has not been clearly defined in marketing circles and could be encompassing a large variety of characteristics, further complicating the educational and promotional needs of producers and handlers of exotic animals and their products. More research is needed on the impact of exotic identification on consumer perceptions and preferences toward meats. This challenging area of future research could lead to valuable insights for those who are attempting to produce and market meats that are considered to be exotic by a significant number of consumers.

The multinomial logit analysis presented some interesting relationships. Sex, race, age, education level, population density, and employment status were explanatory socioeconomic variables in the analysis. Female respondents were less likely to choose any of the alternative species, and white respondents were more likely to choose one of the alternative species. Rising education levels tended to be associated with a smaller probability of selecting alternative meat cuts other than ostrich. Respondents who reported previous consumption of meat from exotic animals were more likely to select one of the alternative meats. Respondents who classified venison as exotic were less likely to select venison or ostrich meats. These results lend evidence that the "exotic" label is likely to hinder consumers from purchasing alternative meats unless they have previous experience with exotic meats.

In retrospect, the authors perceive that the analysis may have been strengthened had two additional items of information been obtained from the respondents. The more important of these two items is whether the household contained a recreational hunter. Households obtaining and consuming wild meat are likely to perceive meat from the four alternative species differently than those households that do not (that is, the respondents definition of exotic is likely influenced by recreational hunt-

ing). A second useful item of information would have been whether the respondent, or another member of the household, was a vegetarian. Households with one or more vegetarians are likely to have less experience with meats of all kinds, whether traditional or exotic. Future household research that involves exotic animals or meat should include these two variables to estimate their influence on the exotic issue.

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