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The Influence of Agro-Terrorism on Consumer Buying Behavior: An Analysis Based on New Jersey Consumers

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Agro-terrorism refers to the instance of bioterrorism against the agricultural and food system. On December 27th, 2001 a taped message from Osama bin Laden stated, "*It is very important to concentrate on hitting the American economy with every available tool . . . the economy is the base of its military power. . . . The United States has a great economy but it is fragile.*" (Islam and Shahin 2002). The agricultural economy is vulnerable to economic sabotage, and because of its low elasticity may be more fragile than other segments of the economy. Food security as a national objective is put into jeopardy if any part of the food system is targeted. Derrickson and Brown (2002) report the definition of food security by the Life Science and Research Office of American Societies of Experimental Biology as "*the assured ability to acquire, safe, nutritious, socially, and culturally-acceptable foods*" with the key phrase being the use of the term "safe." Likewise they define food insecurity as "*whenever the availability of nutritionally adequate and safe foods or the ability to acquire foods in socially acceptable ways is limited or uncertain.*" Keenan et al. (2001) provide a similar definition, while others argue that food security should also include as part of its definition or understanding natural and unnatural threats to the food system including agro- or bioterrorism (Dilley and Boudreau 2001).

This proposition is investigated using results from a mail survey of New Jersey consumers. In November 2003 1000 surveys were mailed to randomly selected NJ consumers. Each survey included a cover letter and a written survey. Pretests on the survey indicated that it would take about 15 minutes to complete the survey. To provide incentive, a dollar bill was included in each mailing. A follow-up letter was sent after 15 days, and by January 2004, 321 usable surveys were returned, a response rate of 32%. The data were analyzed using a logistic

regression. The dependent variable was selected as 1 if the respondent prefers locally grown foods due to the increased threats of domestic terrorism and 0 otherwise. Different socio-economic attributes were selected as explanatory variables.

Respondents were specifically asked if the threat of terrorism increased their preference for locally grown food, defined as fresh fruits and vegetables marketed under the state-sponsored Jersey Fresh label. Of the 304 responses, 104 (34%) indicated that the threat of agroterrorism increased their preference for locally grown food. The results show that 40% or more of single households and households of 4 or 5 members are most likely to purchase locally grown food. Smaller households of 2 or fewer are least likely to respond. More females (191) than males (131) responded to the survey, and the results indicate that women are more likely to respond to terrorism (36%) than are males (30%). Respondents showed an increasing preference for locally grown food with age; only 21.5% of respondents below the age of 35 indicated a preference, whereas 37% of those between 51 and 65 years, and 45% of those above 65% showed a preference. Results also showed that education affects choices; increasing education decreases the preference for locally grown food. For example 39% of respondents with only a high school revealed a preference, while only 19% of those with a postgraduate education showed a preference. Occupation revealed mixed preferences. The largest defined group was retired persons, with a frequency of 46%. In addition, 35% of homemakers, 33% of self-employed, and 27% of those employed by others showed a preference toward locally grown food. Interestingly, the preference for locally grown food decreased with increasing income. Respondents with less than \$20,000 in income were most likely to purchase locally grown food (44%), about 31% of those earning between \$60,000 and \$99,000 showed preference, while only 23% of those earning more than \$100,000 showed a preference. The relationship between marital status and preference was mixed. Widowed persons represented the most likely group to show a preference

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(52%). Married (34%) or separated (33%) persons showed similar preferences, as did single (23%) or divorced (27%) persons.

The chi-square statistic clearly rejects the null hypothesis that all of the independent variables together as a set were not statistically significant at the 1-percent level. The goodness of fit is shown by a McFadden's R-square of 0.14, which is reasonable for cross-sectional data. Approximately 66 percent of the survey respondents were correctly classified as either preferring or not preferring locally grown foods. Of the 18 independent variables, six were significant at least at the 10% level. Respondents who read food labels or brochures are more likely to show preference. These consumers are likely to be more concerned about the nutrient value of what they are consuming and are likely to be careful in their selection of food. Households with children below the age of 17 also show a preference, which indicates increased concern for food security and safety, and consumers who showed knowledge of agricultural production by responding positively to knowledge about integrated pest management also have an increased probability toward locally grown food. Increased probabilities were also positively related to the amount of produce purchased in a month, living in an urban area versus a rural area, the number of years lived in New Jersey, and age between 51 and 65. Racially, respondents who are white are also more likely to prefer locally grown food.

Those with a negative probability are those who shop weekly for food. Frequent purchases of food may represent habit formation, but also may represent a shopping pattern that is easily reversible. Likewise, those who shop for quality or plan purchases ahead of time are less likely to purchase locally grown food because they are already conscious and comfortable with their shopping preferences and feel secure that their food purchases are secure. Respondents who home garden are also less likely to shop locally for food. These respondents may be self-sufficient through the local harvest season in NJ and therefore do not ordinarily purchase produce at any rate, or they may store or preserve homegrown produce. The econometric results for gender, post-graduate education, and income also show lower

probabilities. The gender results reflects the fact that men are less likely to be concerned about terrorism, which is probably a statement that women tend to be more careful about household consumption. Education is an interesting variable. The result may reflect the possibility that more-educated respondents are less likely to take agro-terrorism threats at face value and are more discriminating in validating media, public, and other information on the terrorist threat. The negative relationship with increased income may simply reflect education levels and the earning capacity therein.

Recent concerns about agro-terrorism require understanding of how these threats affect consumer behaviour and markets. This study investigated the response of 304 New Jersey consumers to a survey question on their willingness to purchase local food over imported food. Thirty-three percent of respondents indicated that the threat of agroterrorism has caused them to think locally when it comes to their produce purchases. The results of a Logistic regression showed that there are some specific attributes common among those who show such a preference. Although empirical and theoretical investigations into consumer behaviors under conditions of terrorism risk are in their infancy, this paper provides some needed insight into such problems and the results are easily replicable.

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