

Determinants of Meats Purchase Behavior by Ethnic Groups

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Poster prepared for presentation at the Agricultural & Applied Economics Association's 2010AAEA, CAES & WAEA Joint Annual Meeting, Denver, Colorado, July 25-27, 2010.

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Abstract

Farmers and food companies need to assess their production and marketing strategies for nurturing business opportunities that will arise from the simultaneous increase in population and income of Hispanics in the United States. Previous studies on demand for meat products have not received much attention on the determinants of meats purchase behavior by Hispanics in relation to other ethnic groups. This study investigates the impact of ethnicity and the determinants of meats purchase behavior in the U.S. by using single Probit equations. The analyzed data comes from the U.S. Consumer Expenditure Survey. The results indicate that ethnicity plays an important role in the purchase behavior of meat products, as well as household size and income.

Objective

The aim of this study is to analyze the determinants of meats purchase behavior among various ethnic groups in the United States. The evaluation of differences in buying decisions is achieved by comparing Hispanics with Whites, African Americans and households of other minorities. Our research focuses on answering the following question: does the purchasing behavior for meat products among ethnic groups is equally responsive to household size and income?

Introduction

The face of America is changing and the Hispanic population is a driving force of this change. It is predicted that by the year 2050, more than half of the U.S. population will be composed of ethnic minorities. Such predictions seem to be supported by the 1990 and 2000 population census data. The 2000 U.S. Census revealed that 32.8 million Hispanics resided in the United States, representing about 12 percent of the total U.S. population. In other words, more than one in eight people who live in the U.S. have Hispanic origin. This would make the U.S. the third largest Spanish speaking country in the world (U.S. Census Bureau, 2001; Humphreys, 2003).

Recent studies have shown that Hispanics may exhibit different consumption patterns compared to the rest of the U.S. population, Fan and Solis (1994, 1998). Growth of the Hispanic population and its purchasing power makes imperative the understanding of their consumption patterns. It is predicted that by the year 2050, more than half of the U.S. population will be composed of ethnic minorities. The population projections by ethnicity are presented in Figure 1, Hispanics by 2010 will compose almost 16% of the U.S. population, by 2030 Hispanics will be 20% and by 2050 they will comprise almost 25% of the total population.

It has been documented by Lanfranco (2001) that Hispanics commit a higher percentage of their expenditures to total food relative to other population groups; therefore, it is important to analyze the purchase behavior of meat products by U.S. Hispanics. The growth of the U.S. Hispanic market will have impacts on the demand for food and given the increasing importance of the Hispanic market, this study seeks to understand the determinants of their decisions to purchase meats by using single Probit equations.

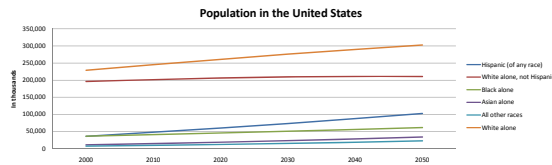


Figure 1. U.S. Census Bureau Population Projections by Ethnicity.

Results and Discussion

Table 1. Marginal Effects of Income for Hispanics.

Product	Coefficient	Standard Error	P>	Marginal Effect
Ground Beef	-0.0598	0.0657	0.3630	-0.0237
Roast Beef	-0.0601	0.0801	0.4530	-0.0139
Beef Steak	0.1407	0.0683	0.0390	0.0507
Other beef	-0.1769	0.0887	0.0460	-0.0294
Bacon	0.0963	0.0738	0.1920	0.0274
Pork Chops	0.0358	0.0753	0.6350	0.0097
Ham	0.0736	0.0720	0.3070	0.0236
Other pork	-0.0199	0.0760	0.7930	-0.0054
Poultry	-0.0024	0.0251	0.9250	0.0469
Seafood	0.0563	0.0661	0.3950	0.0216

Most of the price variables in nominal and real values presented insignificant effects in the decision to purchase, different ways of scaling the price variables were evaluated. Unfortunately the same results were produced. A few socio-economic variables had significant effects on the decision to purchase by different ethnic groups, in part, due to the scaling of the household size.

The inclusion of all demographic variables did not produce significant differences in the average probability to consume. Henceforth, the approach of Lanfranco (2001) was followed, including only the logarithm of the household weekly income and household size in Amsterdam scale as the regressors, since those regressors produced very slight variations in the classification tables of the predicted outcomes compared to the results from models that contained greater number of variables.

Hispanic households were less likely to be influenced by income in their purchase decisions in comparison with White, African American and households of other minorities. The marginal effect measures the infinitesimal change in probability when the regressor is increased by one unit, the results of Probit regressions show that Hispanic households are more likely to consume beef steaks as income increases, and they are less likely to consume other beef products as their income increases.

Table 2. Marginal Effects of Household Size for Hispanics.

Product	Coefficient	Standard Error	P>	Marginal Effect
Ground Beef	0.1194	0.0350	0.0010	0.0474
Roast Beef	0.0441	0.0422	0.2970	0.0102
Beef Steak	0.0454	0.0355	0.2010	0.0164
Other beef	0.1283	0.0459	0.0050	0.0213
Bacon	-0.0343	0.0395	0.3850	-0.0098
Pork Chops	0.0426	0.0395	0.2800	0.0115
Ham	0.1128	0.0371	0.0020	0.0362
Other pork	0.1046	0.0389	0.0070	0.0283
Poultry	0.0400	0.0137	0.0030	0.0667
Seafood	-0.0051	0.0350	0.8850	-0.0019

Only significant marginal effects of income were found in beef steak and other beef products at 5% level of significance; the calculated marginal effect of income was 0.507 for beef steaks and -0.0294 for other beef products (Table 1). Insignificant negative marginal effects of income were found for other pork, poultry, roast beef, and ground beef. Insignificant and positive marginal effects of income were found for bacon, pork chops, ham, and seafood.

Hispanic households were influenced more by the household size than income in their decisions to purchase meat products when they were compared with other ethnic groups. At the 5% level of significance, positive and significant marginal effects of household size were found in ground beef (0.0474), ham (0.0362), other pork (0.283), and poultry products (0.0667). Insignificant and negative marginal effects of household size were found in bacon and seafood products, calculated at -0.0098 and -0.0019, respectively (Table 2).

Methods

This study analyzes the buying decisions for meats by U.S. households in order to understand the determinants of their purchasing behavior. Households were classified by their ethnicity, Hispanic origin (H), Non-Hispanic White households (W), African Americans (AA), and households that belonged to other minorities (OM). The food items that were included in the analysis were ground beef, roast beef, beef steak, other beef, bacon, pork chops, ham, other pork, poultry, and seafood. The dependent variable for a particular food item takes the value of 1 if the household purchased it otherwise the value is zero. The variables that were evaluated as determinants of the decisions to purchase meat products by households were: prices, income, expenditures in other goods, household size, number of persons less than 18 years old, number of persons over 64 years old, age, sex, food stamp status, urban status, and education. The estimation of Probit regressions for each meat product facilitated the analysis of the determinants of the purchasing behavior. In addition to reporting the coefficients of the Probit regressions, marginal effects are estimated. According to the Stata manual (2005) the Probit model is defined as

$$\Pr(y_j = 1 | x_j) = \Phi(x_j \beta)$$

where the right term is the standard cumulative normal distribution and β is its numeric value in the Z scores. Thus, marginal effects are estimated as the following equation

$$\frac{\partial \Phi}{\partial x_j} = \phi(\bar{x}_j) \beta_j$$

Household size is introduced in the Probit equations represented by the Amsterdam scale that represents members of the household by summing a scaled value that gives reference to males 18 years and over with the value of 1; males and females under 14 years are valued as 0.52 equivalent scale; females above 14 years are valued as 0.90 equivalent scale; and males between 14-17 years old are valued as 0.98 equivalent scale (Deaton and Muellbauer, 1980).

White households responded differently than Hispanics. At the 5% level of significance, only beef steak had a positive and significant marginal effect for income with a magnitude of 0.0323. Pork chops had a marginal effect for income of -0.0150, significant only at the 10% level of significance. White households had positive and significant household size marginal effects at the 6% level of significance, with the exception of seafood products. African American households, at the 5% level of significance, presented significant and negative marginal effects on ground beef, ham, and poultry products; significant and positive marginal effect of income was found only for seafood products. All marginal effects of household size were positive with the exception of seafood products; same pattern was found in Hispanic and White households, but their coefficients were insignificant.

Households of other minorities, presented negative marginal income effects for ground beef, bacon, and other pork products, but only the coefficient for ground beef was significant at the 10% level of significance. At 5% level of significance, marginal effects of income were found in beef steak and other beef were significant, their magnitudes were 0.0866 and 0.430, respectively. Households of other minorities presented significant and positive household size marginal effects were found in ground beef (0.051), roast beef (0.034), bacon (0.036), and other pork (0.091) at the 5% level of significance. Negative and insignificant effects were found on beef steak, pork chops and ham.

Conclusions

The marginal effects of Probit regressions show that Hispanic households are more likely to consume beef steaks as income increases, and they are less likely to consume other beef products as their income increases. The results presented in this section contrast with those of Lanfranco (2001). Lanfranco found that Hispanics had positive marginal effects of income, with the exception of other pork; most of the household size marginal effects were significant at the 10% level of significance. In contrast, our results indicate that White households were more like to purchase beef steaks and less likely to purchase pork chops as income increased, their decision to purchase meat products was more influenced by household size.

As a general result, different ethnic groups are more likely to consume meat products as the household increases. Surprisingly, however, for some ethnic groups there were negative marginal effects of household size. In regard to the marginal effects of income, it was found that at least 3 meat products in each ethnic group were negative. Future research to be endeavor by the authors will evaluate the effects of demographic variables using a multivariate approach given the correlations of the decisions to purchase meats. We expect mild improvements due to differences in sample size of Hispanics, African Americans and other minorities in comparison to White households.

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