

How Consumers Decide To Buy or Not To Buy Nonalcoholic Beverages

Cross-tabulation analysis indicated that there might be differences in the amount of beverages purchased based on household demographics. However, no statistical significance was shown. Averages of purchases and the number of households that bought a beverage for each demographic category were given. The demographics associated with choice of consumption are of interest. A probit analysis, which calculates the likelihood of consumers with known demographic characteristics to purchase, is used to determine which demographics are responsible for a household choosing to buy or choosing not to buy a beverage. The probit analysis will provide statistically significant findings of which demographics increase or decrease the probability of purchasing nonalcoholic beverages. The demographics along with the categories in each group that are used for the probit analysis are included in this section. The beverage groupings to be analyzed also are included (table 3). This probit analyses feature ready-to-drink fruit juices (not frozen); ready-to-drink fruit drinks; isotonics; powdered soft drinks; tea; coffee; carbonated soft drinks; bottled water; and flavored and unflavored milk.

All of the demographic categories are expressed by dummy variables, a “1” is indicative of that demographic being present in the household, a “0” indicates

Table 3—Demographics and nonalcoholic beverages analyzed

Demographics used for probit analysis	Nonalcoholic beverages used in the analysis
Household size 1—base	
Household size 2	RTD fruit juices not frozen
Household size 3	RTD fruit drinks
Household size 4	Isotonics
Household size 5	Powdered soft drinks
Age household head less than 25—base	Tea
Age household head 25-39	Coffee
Age household head 40-49	Carbonated soft drinks
Age household head 50-64	Bottled water
Age household head 65 +	Flavored milk
Has no children under 18—base	Unflavored milk
Has children under 18	
Household head employment not employed—base	
Household head employment part-time	
Household head employment full-time	
Household head education less than high school—base	
Household head education—high school	
Household head education—some college	
Household head education—college plus	
White—base	
Asian	
Other	
Not Hispanic—base	
Hispanic	
East region—base	
Central region	
South region	
West region	
> 130% poverty—base	
< 130% poverty	

Source: ACNielsen Homescan data.

otherwise. The base categories listed are not placed into the probit equations to avoid perfect collinearity. As a result, the findings must be compared relative to the base category. For example, households in the Central region were statistically more likely to purchase powdered soft drinks than were households in the eastern region (the base category).

The probit results are summarized in table 4. Each beverage is listed along with the demographic group. If the demographic category was statistically significant (at the 95-percent confidence level) in affecting the decision to consume the beverage, then an “X” is presented in the table. An F-test was conducted on the categories in each demographic group to find the statistically significant drivers.

Race and region of the household were important in the decision to purchase many of the beverages. Household size and age of the head of household affected the decision to buy for all 10 beverages examined. The demographic of household size is understandable since larger households typically purchase more goods at grocery stores and would be less apt to eat away from the home. The presence of a child in a household affected the decision of a household to purchase fruit drinks, isotonic, powdered soft drinks, and flavored milk. Poverty status of the household affected four of the beverages studied: fruit juices, isotonic, powdered soft drinks, and bottled water.

Table 4—Summary of probit analysis

Item	Household size	Age of female Head	Presence of children	Female employment
RTD fruit juices not frozen	X	X		
RTD fruit drinks	X	X	X	
Isotonics	X	X	X	
Powdered soft drinks	X	X	X	
Tea	X	X		
Coffee	X	X		X
Carbonated soft drinks	X	X		
Bottled water	X	X		
Flavored milk	X	X	X	
Unflavored milk	X	X		

Item	Female education	Race	Hispanic	Region	Poverty
RTD fruit juices not frozen	X	X		X	X
RTD fruit drinks	X	X			
Isotonics		X		X	X
Powdered soft drinks	X	X		X	X
Tea				X	
Coffee	X	X	X	X	
Carbonated soft drinks		X			
Bottled water		X		X	X
Flavored milk	X	X		X	
Unflavored milk					

Note: This table shows which demographics are significant (95% level) in determining whether or not a household consumes any of the beverages. If an "X" appears then the demographic is significant.

Source: ERS analysis of ACNielsen Homescan data.

After examining the summary table of the probit findings (data table 10), the individual probit results for each beverage subsequently are discussed. For each beverage, a probit model was run and the p-values associated with each demographic category were retrieved. An F-test on each demographic group also was conducted. Lastly, the marginal effects of each demographic category were computed. These effects show the magnitude of the increase or decrease in the probability of purchasing each beverage, relative to a base category.

Ready-To-Drink Fruit Juices

Household size, age of the household head, household head education, race, region, and poverty status of the household were significant demographics affecting the choice to purchase ready-to-drink fruit juices. Household size and the probability of buying ready-to-drink fruit juices were positively associated. Household heads with more education were more likely to buy fruit juice (fig. 12). Black, Asian, and Other households were more likely to buy fruit juices compared with White households (fig. 13). Households located in the Central, South, or West regions were less likely to purchase fruit juices compared with households located in the East region (fig. 14). Households under 130 percent of poverty were less likely to buy fruit juices than were households over 130 percent of poverty.

Ready-To-Drink Fruit Drinks

Household size, age of the household head, presence of children, education of household head, and race were significant demographic factors affecting the choice to buy ready-to-drink fruit drinks. Again, household size and the probability of buying ready-to-drink fruit drinks were positively related. As shown in figure 15, households with heads older than 25 years old were less likely to purchase ready-to-drink fruit drinks than were households with heads under age 25. As exhibited in figure 16, Black, Asian, and Other households were more likely to buy ready-to-drink fruit drinks when compared with White households. Black households were the most likely group to buy ready-to-drink fruit drinks.

Tea

Household size, age of the household head, and region were the significant demographic factors affecting the choice to buy tea. The probability of purchasing tea and household size were positively associated. According to figure 17, household heads older than 40 years old were more likely to purchase tea than were households with heads under the age of 25. Households with heads in the 25-39 age bracket were less likely to purchase tea compared with households with heads under age 25. Households located in the Central, South, or West region were less likely to buy tea when compared with households located in the East region (fig. 18).

Coffee

Household size, age of the household head, employment of the household head, education of the household head, race, Hispanic origin, region, and

poverty status were demographics that affect the choice to purchase coffee. Households with larger household sizes and household heads older than 25 increased the probability of purchasing coffee. As exhibited in figure 19, household heads that were employed were less likely to buy coffee for at-home consumption than those who were not employed. Heads of household who were better educated were less likely to purchase coffee for at-home consumption than households with less educated household heads (fig. 20). Households of Hispanic origin were more likely to buy coffee for at-home use than non-Hispanic households were. Households located in the Central, South, or West region were less likely to purchase coffee for at-home use when compared with households located in the East region. Households under 130 percent of poverty were less likely to purchase coffee for at-home use than were households over 130 percent of poverty.

Isotonics

Household size, age of the household head, presence of children, race, region, and poverty status were demographics that affected the choice to purchase isotonic beverages, which contain nutritional supplements. Household size and the probability of buying isotonic beverages were positively correlated. As shown in figure 21, households with heads aged 25-49 were more likely to purchase isotonic beverages than those with heads under the age of 25. Households with heads aged 50 and over were less likely to purchase isotonic beverages than those with heads under the age of 25. Households with a child present were more likely to buy isotonic beverages for at-home consumption than were households with no children present. Black and Asian households were less likely than White households to buy isotonic beverages (fig. 22). Households located in the Central, South, or West regions were more likely to buy isotonic beverages when compared with households located in the East region. Households below 130 percent of poverty were less likely to buy isotonic beverages for at-home use than were households above 130 percent of poverty.

Powdered Soft Drinks

Household size, age of the household head, presence of children, education of household head, race, region, and poverty status were demographics that affected the choice to purchase powdered soft drinks. Household size and the probability of buying powdered soft drinks were positively related. Households with heads aged 25-49 were more likely to buy powdered soft drinks than were those with heads under the age of 25. Households with heads aged 50 and older were less likely to buy powdered soft drinks than were those with heads under the age of 25. Heads of households with a high school education were more likely to purchase powdered soft drinks than were the household heads with less than a high school education. Heads of households with an education above high school were less likely to buy a powdered soft drink than were those with less than a high school education. Black households were more likely than White households to buy powdered soft drinks, while Asian households were less likely to purchase powdered soft drinks than Whites (fig. 23). Households under 130 percent of the poverty level were more likely to buy powdered soft drinks for at-home consumption than were households over 130 percent of the poverty level. Households located in the Central and South regions were more likely to

purchase powdered soft drinks than households located in the East (fig. 24). Households located in the West were less likely to purchase powdered soft drinks compared with the East.

Carbonated Soft Drinks

Household size, household head age, and race influenced the choice to buy carbonated soft drinks. Household size and the probability of buying carbonated soft drinks were positively linked. Household heads aged 25 to 64 were more likely to buy carbonated soft drinks relative to household heads under 25, while household heads aged 65 and older were less likely to buy carbonated soft drinks compared with households with the head under age 25 (fig. 25). Black households were more likely to buy carbonated soft drinks for at-home use than were Whites. Asian and Other races were less likely to purchase carbonated soft drinks for at-home use when compared with White households (fig. 26).

Bottled Water

Household size, age of the household head, race, region, and poverty status affected the choice to purchase bottled water. Household size and the probability of buying bottled water were positively associated. Household heads aged 25 to 64 increased the probability of purchasing bottled water versus those household heads under age 25. Household heads age 65 and older lowered the likelihood of bottled water purchases compared with household heads under age 25. Black, Asian, and Other households were more likely to buy bottled water than were White households (fig. 27). Households located in the central region were less likely than households residing in the East to buy bottled water, while households located in the West and South were more likely to buy bottled water relative to households located in the East (fig. 28). Households below 130 percent of poverty level were less likely to purchase bottled water than were households above 130 percent of poverty level.

Flavored Milk

Household size, age of the household head, presence of children, education of the household head, race, and region were demographics that influenced the choice to buy flavored milk. Household size and the probability of buying flavored milk were positively correlated. Household heads aged 25 to 49 increased the probability of buying flavored milk compared with those household heads under 25. Household heads age 50 and older lowered the likelihood of purchasing flavored milk compared with households headed by someone under age 25 (fig. 29). Households with a child present were more likely to buy flavored milk. Household heads having post-high school education were more likely to purchase flavored milk than were household heads with less than a high school education. Households where the head had an education greater than high school were less likely to purchase flavored milk when compared with households with less than a high school education. Central and South households were more likely to buy flavored milk than East households, while West households were less likely to buy flavored milk when compared with East households (fig. 30).

Unflavored (White) Milk

Household size and age of the household head were the only demographics that affected the choice to purchase unflavored milk. Larger households were more likely to buy unflavored milk than smaller households (fig. 31). Households where the age of the head was greater than 25 were much less likely to buy unflavored milk than were households where the head was under age 25 (fig. 32).

Prediction Success of the Probit Models

After finding that demographic factors were significant drivers associated with the choice of to buy or not to buy nonalcoholic beverages, predictions of the decision to buy or not to buy were made (data table 11). If the predicted probability of purchasing was larger than the percentage of households in the data set that actually bought, then the household was predicted to be a purchaser (consumer). For example, if we predicted a probability of 0.65 that a household would purchase powdered soft drinks, we would classify that household to be a purchaser since 0.65 is greater than 0.4852 (the percentage of households in the panel that actually bought powdered soft drinks). This process was done for all 10 beverages. The results of the prediction experiment are included in data table 11.

Overall, knowing the demographics helps in predicting the purchases of nonalcoholic beverages. The findings are broken down into several categories in the table. The percentage of total correct predictions (correctly predicting if the nonalcoholic beverage was bought and correctly predicting if the beverage was not bought) is given in one column. The most difficult nonalcoholic beverage to predict was tea, with only a 58-percent correct prediction rate. The choice of buying carbonated soft drinks and unflavored milk was the easiest to predict, with correct predictions of over 70 percent. The last two columns show that the probit analysis helps predict which households will buy, given that they actually do, as well as predicting which households will not buy, given that they actually do not. For the nonalcoholic beverages considered, the probit models correctly predicted household purchase behavior in 56.8 percent (tea) to 72.1 percent (carbonated soft drinks) of the sample. For nonpurchase behavior, the probit models were correct in 59.3 percent (bottled water) to 80.9 percent (ready-to-drink fruit drinks) of the sample of 7,195 households.