At-Home and Away-From-Home Consumption of Seafood in the United States

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Abstract: At-home consumption of shrimp, oysters, and catfish is investigated, using data from a mail survey conducted in 2000-2001. Results indicated consumers probability and frequency of consumption decreased if consumers felt they lacked preparation knowledge, product preparation was too time consuming, or the smell was unattractive. Demographics were also significant.

Keywords: At-home seafood consumption; double-hurdle model; Catfish consumption; Oyster Consumption; Shrimp Consumption.

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Introduction

US consumers today are dining out more often than ever before in the past. Over the past decades, eating out has been increasingly popular (USDA-ERS, 1999). Away-from-home food expenditures increased from 33 percent of total food expenditures in 1970 to 46 percent in 1996, and 47.5 percent in 2001 (USDA-ERS, 2002b). Reasons for this trend include smaller household size, more affordable and convenient fast food services, growing number of women working outside the home, and higher household incomes (USDA-ERS, 1999).

Along with dining out more often, US consumers are eating more seafood. The estimated per capita seafood consumption in the United States was 14.7 pounds in 1992, an approximate increase of 3 pounds from 1970. By the year 2000, the per capita consumption of seafood was 15.6 pounds (USDA-ERS, 2002a). US consumers are traditionally known as away-from-home consumers of seafood products. Although no precise data are available, one estimate by Keithly in 1986 suggested that the quantity of away-from-home consumption of seafood products ranged from one-third to two-thirds of all seafood consumed. A recent study by Selassie, House, and Sureshwaran (2002) found 57, 62 and 58 percent of meals with shrimp, oysters, and catfish, respectively, were consumed away-from-home (Figure 1). This set of figures compares to general food consumption, where 16 percent of the meals were eaten away-from-home in 1978; a figure that increased to 29 percent by 1995 (USDA-ERS, 1999).

Given the increase in seafood consumption and the potential for its growth, it is

important for seafood marketers to establish distinct programs to help promote the growth of the industry. One potential would be to try to close the gap in meals consumed at-home for seafood compared to other meals. Another alternative is to encourage more at-home seafood consumption through product development.

This paper focuses on developing an understanding of factors that influence at-home consumption of shrimp, oysters, and catfish. Seafood producers, processors, and marketers can use the information to increase at-home seafood consumption. Additionally, the relationship between at-home and away-from-home consumption can be tested to see if there is a positive or negative relationship and infer if the increase in at-home consumption will occur at the expense of away-from-home consumption of seafood or other products.

Previous studies

Keithly (1985), using food consumption survey data, focused on a set of socioeconomic and demographic factors that affect at-home consumption of total seafood and five specific products. He found that region, urbanization, race, household size, money value of meals consumed away-from-home, and income were all contributing factors which helped to explain at-home seafood consumption patterns.

Cheng and Capps (1988) investigated the key socio-demographic determinants of at-home demand for several fresh and frozen finfish and shellfish species. They found factors explaining the variation of expenditures on seafood were own price, household income, household size, coupon value, geographic region, urbanization, race, and seasonality.

Yen and Huang (1996) found that price of finfish, shopping frequency, geographic region, race, and the life-cycle variable were the key factors that affect significantly both the probability of participation and the level of household finfish consumption in the United States. Furthermore, they found a variable might exert opposite effects on the probability and level of seafood consumption.

House *et al.* (2003) found source of seafood for consumption, enjoyment of flavor, availability, price, allergies, male consumers, and geographic reasons to be significant in determining probability of participation in oyster consumption. They found the double-hurdle model was a significantly better fit than a tobit model. Variables significant in the level of consumption of oysters included source of seafood for consumption, enjoyment of flavor, tradition, price, product safety, geographic region, income, and age.

Data

The data for this study was obtained through a mail survey. After conducting focus groups of seafood consumers, a questionnaire was developed and pre-tested to elicit information on seafood consumption. The survey was mailed to 9,000 households, with 1,000 households in each of the nine major census regions. The surveys were mailed in a two-wave mailing late 2000 and early 2001. This approach yielded 1,790 returned surveys or a response rate of 20.1 percent (after accounting for 'return-to-sender' surveys). Respondents were asked to indicate how often they consumed seafood for breakfast, lunch, and dinner, both at-home and away-from-home[1].

Of the survey respondents that completed the questions needed for this study, 1,034 consumed shrimp, 521 consumed oysters and 652 consumed catfish. Table 1

[1] See Selassie, House, and Sureshwaran (2002) for survey details

provides descriptive statistics for these observations. Respondents were asked to indicate how often they consumed shrimp, oyster, and catfish for breakfast, lunch, and dinner, both at-home and away-from-home. For example, the frequency of at-home consumption of shrimp is the sum of responses to the three questions about breakfast, lunch, and dinner, at-home consumption for a one-month time period. The frequency of away-from-home consumption of shrimp is the sum of responses to the three questions about breakfast, lunch, and dinner, consumption of shrimp away-from-home for a one-month time period.

Overall, 12.4 percent or 128 of the respondents indicated that they only consume shrimp away-from-home; 26.5 percent or 138 of the respondents indicated that they only consume oysters away-from-home; and 21.5 percent or 40 of the respondents indicated that they only consume catfish away-from-home.

Respondents who ate shrimp at-home consumed shrimp on average of 2.4 times per month at-home. Respondents who ate oysters at-home consumed oysters an average of 1.5 times per month at-home. Those who ate catfish at-home consumed catfish on average of 2.0 times per month at-home (Table 2).

Additionally, factors included as independent variables were demographic variables (age, ethnicity, religion, household income, and education), variables regarding the respondent geographic location and variables regarding to stated preference. Descriptive statistics for all variables are shown in Table 1 and Table 2.

Compared with US Census data (US Census Bureau 2000), the results indicate a large percentage of the respondents to the survey were Caucasian (89 percent in the survey compared to 75 percent in the Census). Survey respondents also were more educated than average, with approximately 50 percent of the sample with a four year

college degree. Though this is typical for results from a mail survey, interpretation of the results should be conducted recognizing this fact. Additionally, future studies in this area should make an attempt to focus on the underrepresented population.

Model

Many previous studies found that a significant proportion of households did not consume seafood. Keithly used a tobit model to accommodate the problem of zero consumption. The tobit model is restrictive in parameter estimation because it is assumed that both the probability and the level of consumption are affected simultaneously by the same factors.

Lin and Milon (1993), Yen and Huang (1996), House *et al* (2003), and Drammeh *et al*. (2002) found that the decision to consume a seafood product has determinants that are independent of the level of consumption. To accommodate the restrictions of using a tobit model in analysis for seafood consumption, they used a double hurdle model.

Based on the empirical evidence, a double hurdle model will be used in this study. A specification test will be used to determine if the decision and the frequency of at-home seafood consumption among existing consumers are independent of each other. Explanatory variables may have differential and even opposite effects in the two decision stages, participation decision and consumption decision.

$$y_i^* = x_i\beta + u_i$$

$$d_i^* = z_i\alpha + v_i \qquad \text{With } d_i = 0 \text{ or } 1$$

where y_i^* represents the consumption decision and d_i^* is a latent variable describing participation decision.

The double-hurdle model has separate participation and consumption equations that are related in the following manner:

$y_i = y_i^*$ if $y_i^* > 0$ and $d_i^* > 0$

$= 0$ otherwise

x_i/z_i is a vector of explanatory variables, α and β are parameter vectors determining random errors u_i and v_i, distributed as $u \sim N(0, 1)$ and $v \sim N(0, \sigma^2)$. u and v are independent, following normality assumption. It is assumed that household i's decision to participate in at-home seafood consumption can be expressed as the participation equation d_i. The conditional at-home seafood consumption is expressed as the equation y_i. Thus, the probability of consumption and level of consumption are determined by separate sets of parameters. Note that the use of the same set of explanatory variables in both equations is not as restrictive as it seems because these variables affect consumption and participation differently through the different parameter coefficient (α and β).

Empirical Results

The following model was estimated using a double hurdle model (Cragg, 1971) with the frequency of at-home consumption as the dependent variable. The marginal effects of the independent variables are shown in Table 3. The probit model correctly predicts a consumers' likelihood to be at-home consumers or not. The likelihood is 89%, 80%, and 83% for shrimp, oysters, and catfish, respectively. This can be compared to a naïve prediction, which would result in correctly predicting at-home consumption of 87% for shrimp, 74% for oysters, and 79% for catfish. The chi-squared specification test (Greene, 1995), $\partial = -2(f_{\text{Tobit}} - f_{\text{Probit}} - f_{\text{Truncated}})$, is used to determine whether the double

hurdle model is a better fit than the tobit specification for each of the species (shrimp, ∂ = 492.59, *df*= 42; oyster, ∂ = 131.49, *df*= 42; catfish, ∂ = 244.25 *df*= 42).

As expected, results indicated that if a person consumed the species (shrimp, oyster, or catfish) away-from-home more frequently, they were significantly more likely to be at-home consumers and to consume at-home more frequently. Results indicated that for each one-unit increase in frequency of consumption of away-from-home (one unit equals one time per month), the respondents were 2%, 7.5%, and 4.9% more likely to consume shrimp, oysters, or catfish at-home, respectively. For each one-unit increase in frequency of consumption away-from-home, respondents increased consumption at-home by 0.26, 0.19, and 0.21 times per month at-home for shrimp, oysters, and catfish respectively.

The more frequently consumers ate other seafood away-from-home, the less likely they were to consume oysters and catfish at-home (1.1% and 0.9% less likely with each unit increase in frequency of consumption of other seafood away-from-home). Additionally, with each unit increase in other seafood consumption away-from-home, frequency of consumption at-home of shrimp and catfish decreased by 0.07 and 0.03 units respectively. Increases in frequency of at-home consumption of other seafood significantly increased both the probability and frequency of consumption of shrimp, oysters, and catfish at-home.

Variables representing the respondents' top three reasons for consuming shrimp, oysters, or catfish, as well as their top three reasons for not consuming these products more often were included in the model to develop an understanding of factors that could influence product adoption. If the person indicated they consumed shrimp because they enjoyed the flavor, for health/nutritional reasons, or because they knew how to prepare

shrimp, they were more likely to consume shrimp at-home. Oyster consumers were more likely to consume at-home if they selected price or convenience as reasons for consumption. Catfish consumers were more likely to consume at-home if they selected convenience as the reason for consuming catfish. Frequency of consumption at-home was significantly affected by different variables. For both shrimp and catfish, consumers indicating they consumed shrimp to add variety to their diet were likely to consume shrimp at-home less frequently. No other variables from this category significantly influenced frequency of consumption of shrimp.

Frequency of catfish consumption also was influenced by the variable representing flavor, implying consumers who selected catfish because they enjoyed the flavor were more likely to consume catfish at-home more frequently than consumers who rated other reasons as more important. Oyster consumers were more likely to consume at-home more frequently if they indicated health/nutrition as the reason for consuming oysters. Variables representing availability and tradition/habit were not significant in determining either consumption or frequency of consumption for shrimp, oysters, or catfish. Respondents also were asked to identify the top three reasons they did not consume or did not consume more shrimp, oyster, and catfish, respectively. Significance and direction of impacts of these variables varied considerably by product. Probability of at-home consumption of shrimp was increased if the respondent indicated they did not consume shrimp due to custom and decreased if they indicated they did not consume shrimp due to smell or taste. Probability of at-home consumption of oysters decreased if respondents indicated they did not consume oysters due to preparation time or smell, and probability of at-home consumption of catfish increased if respondents indicated they

did not consume catfish due to price and decreased if they indicated they did not consume catfish due to lack of preparation knowledge. Magnitude of these impacts also was highly variable. Respondents were less likely to consume oysters at-home because of smell, 31%, or the time it takes to prepare, 14%. Approximately, 15% of the respondents were less likely to consume catfish at-home due to lack of preparation knowledge. Similarly, shrimp consumers were less likely to eat at-home because of taste, 7%, and smell, 5%.

Frequency of shrimp consumption was not significantly impacted by these variables, but oyster and catfish consumption were. At-home oyster consumption decreased by 0.75 times per month due to lack of preparation knowledge and 0.44 times per month due to product safety concerns. At-home catfish consumption decreased by 0.60 times per month due to the smell and 0.27 times per month due to price concerns.

Demographics did have effects on both the decision of at-home consumption and the frequency of at-home consumption. Region significantly impacted frequency of consumption of oysters and probability of consuming catfish. In general, consumers in the Southeast Atlantic and Central regions of the country were more likely to consume catfish compared to consumers in the New England region and consumers in the Coastal areas along the Eastern Seaboard and Gulf Coast were significantly likely to consume oysters less frequently.

Caucasian consumers were significantly less likely to consume shrimp and catfish as frequently. Caucasian consumers were also significantly less likely to be at-home consumers of catfish. Religion was only significant in the shrimp model, with catholic consumers (base group) more likely to consume shrimp at-home.

Education had an impact of shrimp consumption, with higher educated groups more likely to consume shrimp at-home, but the highest educated group was more likely to consume less frequently. Middle-income groups were significantly less likely to consume shrimp at-home. The youngest two age groups (age 50 and lower) were significantly likely to consume shrimp at-home less frequently and their probability of consuming oysters decreased.

Conclusions and Implications

Given that more opportunities may exist to expand the market of at-home seafood consumption compared with away-from-home seafood consumption, it is important to understand the factors that influence at-home seafood consumption. The main goal of this study is to analyze the significant factors that influence the probability and frequency of seafood consumption, especially among at-home seafood consumers.

One potential concern about increasing at-home consumption might be that it would occur at the expense of away-from-home consumption of the same species. However, this study found a positive relationship between at-home and away-from-home consumption. The potential for increasing seafood consumption at-home may be greater, as currently seafood is more often consumed away-from-home.

The differences in consumer perceptions of shrimp, oysters, and catfish can be seen through the relationships to variables representing reasons for consuming and not consuming the products. Interestingly, product safety concerns, often cited as a problem in the oyster industry, did not impact the decision to consume oysters, but did decrease monthly at-home oyster consumption from 1.5 times per month to 1.05 times per month.

This result implies work to improve oyster safety or perception of oyster safety would impact current consumers, but would not sway non at-home consumers to change their behavior. It appears that if consumers choose shrimp or catfish to add variety to their diet, it decreases the frequency of at-home consumption. This would make sense as something added to the diet to add variety may occur on a less frequent basis than something added to the diet because the consumer really enjoys the flavor.

Of particular use to the industry are the results surrounding the variables reflecting concern over preparation time, knowledge, and smell. Consumers indicating that a product was time consuming to prepare or that they lacked preparation knowledge for the product were less likely to consume oysters and catfish at-home. Work by the industry to increase knowledge about these products, such as demonstrations and recipe cards could be successful in increasing demand for these products at-home. Additionally, smell was an issue for all three products. In focus groups prior to the survey, participants frequently discussed the amount of time it took to "clear out" the smell after cooking one of these products at-home. Potential innovation in the industry to bring ready to cook products to the grocery stores might overcome some of the perceived smell issues (as well as preparation time and knowledge issues) and increase at-home demand. The impact of smell should not be ignored, particularly for the oyster and catfish industry, as the magnitude of this variable was large, decreasing probability to consume shrimp and oysters at-home by 5% and 31% respectively and decreasing frequency of catfish consumption at-home by 30% (from 2.0 times per month to 1.4 times per month).

Relationships seen in the demographics are generally consistent with a priori expectations. Catfish consumption often is seen as regional, and the regions where

catfish is produced, and where per capita consumption is the highest, were significantly more likely to consume catfish. Interesting though, was the finding that many of the Coastal regions were significantly likely to consume oysters less frequently. However, consumers in the New England and Western regions, nearer oyster harvesting, were likely to consume oysters more frequently.

The relationships between the age variables and at-home consumption tell an important story to the seafood industry. The younger age groups were either less likely to consume the product at-home or likely to consume less frequently at-home. One possible explanation is that young people prefer not eat at home as often or lack cooking skills. Generally this finding is not a trend that an industry would like to see, as younger consumers are often setting future trends. Further study into this relationship would be useful, including determining if the number of children present in the household is partially explaining this trend (this variable was not collected in the current survey).

The seafood industry can use the characteristics identified in this study to increase sales for at-home consumption aimed at existing seafood consumers. Market penetration can increase sales of current seafood products among existing customers by increasing their consumption at-home. There is no change in either the basic product line or the customers served. The strategy of new product development involves selling new seafood products to existing customers. The importance of new product development is indicated by the concerns for more preparation knowledge and less smell.

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Table 1. Summary of demographic information.

	SHRIMP		OYSTERS		CATFISH	
	Away-from	At-home	Away-from	At-home	Away-from	At-home
	%	%	%	%	%	%
Age of Respondent						
Greater than 65	23.4	20.8	15.2	27.7	19.3	24.0
Between 50 and 65	40.6	35.2	32.6	38.6	30.0	36.3
Between 35 and 50	30.5	36.3	38.4	29.8	40.7	33.0
Under 35	5.5	7.7	13.8	3.9	10.0	6.6
Gender						
Percent-Female	61.7	59.1	73.9	62.7	66.4	59.8
Household Income						
Less than $29,999	12.5	14.6	10.9	15.9	12.1	15.8
$30,000 - $49,999	30.5	22.5	18.1	21.4	20.7	27.7
$49,000 - $74,999	27.3	24.5	23.9	27.4	25.7	23.6
$75,000 - $99,999	14.1	16.1	15.9	13.1	13.6	15.4
$100,000 or greater	15.6	22.3	31.2	22.2	27.9	17.4
Region of Residence						
New England	9.4	12.7	10.1	9.9	6.5	6.0
Mid-Atlantic	5.5	11.4	10.9	9.4	12.2	7.8
Southeast Atlantic	8.6	12.5	15.2	13.1	7.9	12.2
East North Central	16.4	9.7	8.0	6.8	12.2	11.0
East South Central	10.9	9.1	9.4	14.1	12.2	15.8
West North Central	21.1	11.6	12.3	10.7	14.4	12.8
West South Central	8.6	10.7	13.8	13.6	10.7	18.2
Mountain	12.5	11.9	10.9	11.5	14.4	9.8
Pacific	7.0	10.5	9.4	11.0	10.1	6.6
Lives < 50 miles of Coast	24.2	34.4	29.7	32.9	25.7	26.8
Religion						
Catholic	17.2	27.6	29.0	23.2	23.6	22.5
Christian	68.0	56.4	55.8	59.5	60.0	64.5
Other	14.8	16.0	15.2	17.2	16.4	13.1
Ethnicity						
Caucasian	94.5	86.9	89.9	83.0	96.4	82.0
Non-Caucasian	5.5	13.1	10.1	17.0	3.6	18.0
Education						
High School or less	24.2	16.5	13.8	19.3	14.3	21.1
Some College	13.3	23.0	17.4	26.6	16.4	25.0
2 year College	9.4	10.5	9.4	6.3	7.9	10.7
College degree (s)	53.1	50.1	59.4	47.8	61.4	43.2

Table 2. Descriptive statistics on other factors included in the Double-Hurdle model.

	SHRIMP CONSUMERS (%)		OYSTER CONSUMERS (%)		CATFISH CONSUMERS (%)	
	Away from home only n=128	At-home n=906	Away from home only n=138	At-home n=383	Away from home only n=140	At-home n=512
Frequency of Consumption (times per month):						
At-Home	0	2.4	0	1.5	0	2.0
Away-From-Home	1.2	2.5	0.9	1.8	1.0	1.9
Other Seafood At-Home	4.0	8.9	7.7	12.8	6.0	10.8
Other Seafood Away-From-Home	3.7	6.9	8.0	9.9	6.6	8.7
Indicated the following was one of the top three reasons for consuming						
Enjoy flavor	60.9	83.6	60.1	67.1	65.7	68.8
Health/Nutrition	13.3	26.5	6.5	5.7	28.6	32.4
Tradition/Habit	10.9	17.2	18.1	15.7	10.7	13.5
Price is attractive	8.6	10.0	2.2	7.3	17.1	22.1
Availability	27.3	29.8	23.2	20.9	22.9	18.0
Convenience	13.3	14.4	4.4	7.6	5.7	7.6
Variety in diet	32.0	35.1	35.5	30.3	29.3	23.2
Know how to prepare	2.3	15.7	4.4	9.7	5.0	9.0
Indicated the following was one of the top three reasons for not consuming:						
Price too high	35.2	38.6	31.2	39.7	17.1	23.6
No fresh products available	14.1	13.4	23.2	18.8	20.7	17.0
Not part of custom	0.8	4.9	5.8	3.9	10.7	6.5
Lack preparation knowledge	13.3	8.6	16.7	10.2	30.7	10.6
Too time consuming to prepare	14.1	9.6	8.7	5.0	18.6	12.7
Texture	3.1	0.9	18.1	8.4	6.4	4.7
Smell	7.0	2.5	13.0	2.4	5.7	8.6
Taste	7.0	1.3	15.9	6.5	5.7	5.7
Product safety concerns	8.6	5.1	29.0	21.4	8.6	5.7

Table 3. Empirical Results from the Double-Hurdle Model – Marginal Effects.

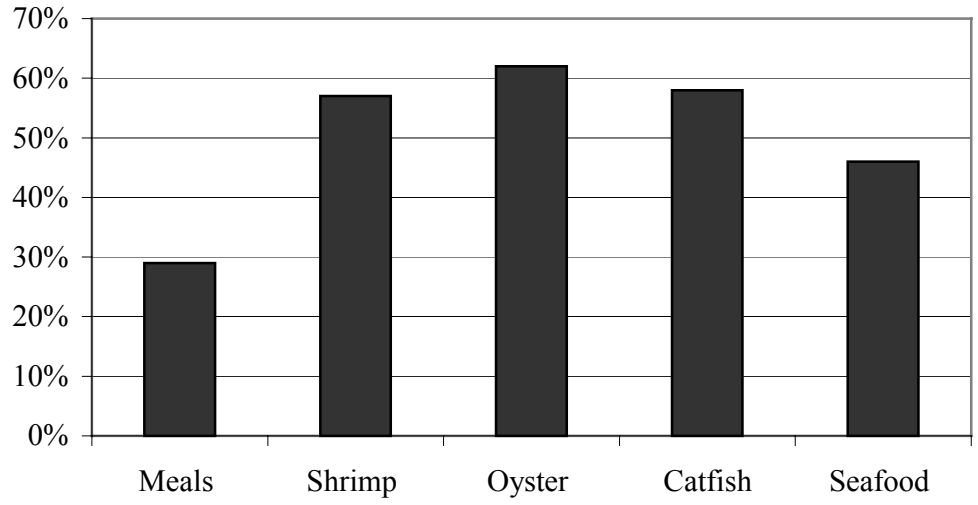
	SHRIMP		OYSTER		CATFISH	
	Probit	Trunc.	Probit	Trunc	Probit	Trunc.
	$\partial F(z)/\partial x$	$\partial E(y^*)/\partial x$	$\partial F(z)/\partial x$	$\partial E(y^*)/\partial x$	$\partial F(z)/\partial x$	$\partial E(y^*)/\partial x$
Frequency of Consumption:						
Away-From-Home	0.020*	0.264*	0.075*	0.194*	0.049*	0.208*
Other Seafood Away-From-Home	-0.002	-0.074*	-0.011*	-0.006	-0.009*	-0.030*
Other Seafood At-Home	0.008*	0.080***	0.018*	0.034*	0.020*	0.039*
Indicated the following was one of the top three reasons for consuming:						
Enjoy flavor	0.048*	-0.155	0.048	0.121	0.023	0.256***
Health/Nutrition	0.040**	0.040	-0.009	0.330***	0.031	-0.002
Tradition/Habit	0.023	0.114	-0.024	-0.051	0.009	0.157
Price is attractive	0.001	-0.005	0.192***	0.106	0.043	-0.081
Availability	-0.001	0.006	-0.032	-0.145	-0.036	-0.182
Convenience	0.009	0.017	0.202**	0.147	0.092***	-0.335
Variety in diet	0.005	-0.337*	-0.063	0.156	0.004	-0.542*
Know how to prepare	0.088*	-0.607	0.078	-0.044	0.053	0.068
Indicated the following was one of the top three reasons for not consuming:						
Price too high	0.008	-0.204	0.100**	-0.062	0.090**	-0.266***
No fresh products available	-0.027	0.107	-0.064	-0.027	-0.287	0.316
Not part of custom	0.092**	-0.086	-0.082	-0.054	-0.016	-0.242
Lack preparation knowledge	-0.010	-0.088	-0.083	-0.750*	-0.152*	-0.109
Too time consuming to prepare	-0.017	-0.034	-0.143***	-0.020	0.003	-0.044
Texture	0.003	0.331	-0.043	-0.021	0.018	-0.044
Smell	-0.046***	-0.260	-0.312*	-0.009	0.050	-0.598**
Taste	-0.066***	-1.170	-0.049	-0.288	0.072	-0.554
Product safety concerns	-0.031	0.253	-0.052	-0.436**	-0.044	0.387
Demographics						
Mid-Atlantic	0.038	-0.317	0.079	-0.635*	0.012	-.0148
Southeast Atlantic	0.031	-0.091	0.048	-0.351***	0.149**	-0.349
East North Central	-0.003	0.059	0.098	-0.325	0.112**	-0.494***
East South Central	0.012	0.128	0.167**	-0.404**	0.143**	0.179
West North Central	-0.015	-0.226	0.044	-0.145	0.116**	-0.220
West South Central	0.021	0.014	0.049	-0.253	0.129**	-0.199
Mountain	0.022	-0.363	0.108	-0.717**	0.062	-0.208
Pacific	0.034	-0.238	0.039	-0.234	0.020	-0.931*
Caucasian	-0.011	-0.636*	-0.066	-0.151	-0.148*	-0.446*
Some College	0.063*	-0.704	0.031	0.091	0.009	0.061
2 year College degree	0.047**	-0.275	-0.108	0.163	0.055	-0.438***
College degree (s)	0.022	-0.454*	-0.044	-0.193	-0.055	-0.167

$30,000 - $49,999	-0.043**	0.038	0.052	-0.065	0.056	0.011
$49,000 - $74,999	-0.048**	0.244	0.051	-0.021	-0.007	0.169
$75,000 - $99,999	-0.024	0.449	-0.000	-0.258	0.093***	0.005
$100,000 or greater	0.005	0.165	-0.005	-0.084	-0.009	0.036
Christian	-0.026***	-0.137	0.064	-0.046	0.050	-0.090
Other Religion	-0.033***	-0.107	0.056	-0.050	0.025	0.077
Between 50 and 65	-0.007	-0.110	-0.018	-0.082	0.003	-0.090
Between 35 and 50	0.019	-0.290***	-0.092***	-0.012	-0.030	-0.434*
Under 35	0.038	-0.392***	-0.268*	0.112	-0.062	-0.390
Lives within 50 miles of coast	0.003	0.161	0.032	-0.179	0.001	0.143
Log-likelihood function	-285.61	-1492.26	-299.45	-423.16	-260.40	-725.07
Percent of correct predictions in probit model	88.8%		80.4%		83.1%	

[a] One, two, and three asterisks indicate significance at the 0.01, 0.05 and 0.10 levels, respectively.

[b] Standard errors of the coefficients are reported in parentheses.

Figure 1. Percent of Seafood Meals Eaten Away-From-Home.



* All meals data was from 1995, other categories from 2001 (more recent data not available for all meals)