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EXECUTIVE SUMMARY

The rapid expansion of ethnic populations presents significant opportunities for fruit and vegetable producers along the East Coast to take advantage of their close proximity to densely populated areas. This study was undertaken to document and quantify the ethnic produce market to identify opportunities for farmers to grow crops targeted from a demand perspective. The project has two phases, Phase I and Phase II, which address the market demand and supply respectively. The Phase I results and analyses contained in this publication assess the ethnic market to tailor production research and support marketing efforts to bridge gaps between consumers, distributors, and growers. The Phase II research, currently underway, utilizes this consumer demand information to develop production trials, grower recommendations, and strategies to coordinate year-round production of select ethnic crops to serve this market niche and address the existing local supply-demand gap.

The specific ethnic market subjects of study are the Asian and Hispanic segments, chosen for their strong recent growth and continued growth expectations. The top two sub-groups within each of these segments were chosen for the study; Chinese and Asian Indian (Asian sub-groups) and Puerto Rican and Mexican (Hispanic sub-groups). The geographic focus is the East Coast and includes Washington D.C. and sixteen states bordering the East Coast. A statistically representative sampling of consumers from each of the four ethnic sub-groups in the area was gathered via a stratified sampling method. Bilingual phone surveys were developed and administered and 1,084 completed surveys (271 per sub-group) were collected to assess ethnic produce demand, quantify the current market, and obtain purchase data for ethnic crops to prioritize selections for production trials. An additional 282 surveys (across ethnic sub-groups) were collected from ethnic consumers that don't generally purchase ethnic produce to ascertain reasons as to why.

Survey results revealed relevant characteristics, shopping patterns, and preferences and opinions of respondents and created consumer profiles to target specific ethnic markets. Analysis of the results revealed some similarities across all four ethnic sub-groups and created a general profile for the combined consumer group. Similarities between sub-

groups within the respective Asian and Hispanic ethnicities were highlighted in cases where Asians and Hispanics are dissimilar, in order to identify characteristics unique to each major ethnic group. Likewise, distinct differences among all four sub-groups were highlighted to identify unique characteristics, relative to other ethnic sub-groups.

A summary of general consumer characteristics found that a majority of respondents from each sub-group were female, 36 to 50 years of age, living in a household with two to four members. Social and economic characteristic data revealed that half or more of respondents from each sub-group completed two or more years of college, were married, and had annual incomes of less than $60,000 per year (with 40% to 50% from each sub-group having $20,000 or more, up to $60,000). Two thirds or more from each sub-group were employed. More Asians than Hispanics completed four or more years of college and had higher incomes (Asian Indians having highest education and income levels) and there were more married Asians than Hispanics. Analysis of acculturation factors revealed that roughly half of the respondents in each sub-group have lived in their current city and/or state for more than ten years. A majority from each group were slit between urban and suburban neighborhoods, with a quarter or less of Hispanics and 7% or less of Asians residing in rural areas. Three quarters or more speak their respective ethnic language. A vast majority of both Asian sub-groups (~86%) were from their country of ethnic origin, in contrast to less than half of Hispanics (44% Mexicans and 29% Puerto Ricans). Immigrating Asians were generally older their Hispanic counterparts upon arrival to the United States. In general, with the exception of respondent (principal shopper) gender, the ethnic consumer characteristic data found in this study generally corresponded with the comparable national demographic profiles provided by the United States Census for the four respective ethnic sub-groups, where applicable (Census 2000; American Factfinder – Demographic Profile Highlights). Moreover, the national demographic profiles of these four sub-groups are dissimilar, based on numerous characteristics, from the total population (and "White alone") which supports the need for additional ethnic market-specific information.

An analysis of shopping patterns, beliefs, and behaviors associated with ethnic produce purchases further defined the ethnic consumer profiles. Purchase pattern data revealed that respondents' ethnic produce expenditures averaged $86 per month (and within $12 of this for each sub-group). Asian and Hispanic sub-groups were above and below this mean, respectively. The Chinese shopped an average of six times per month as compared to four times per month by every other sub-group. The Asian Indians had higher expenditures per visit than the other three sub-groups. This seemingly correlates to the fact that half of Asian Indian respondents were vegetarians, as compared to 7% or less of respondents in the other groups. Both ethnic and typical American grocery stores were commonly cited as places of purchase by respondents from all ethnic groups, while farmer and roadside markets were less popular. More Asians (~85%) than Mexicans (~50%) frequented ethnic grocery stores, while the converse was true for typical American grocery stores. 25% of Mexicans grew their own ethnic produce, as compared to less than one quarter of respondents from each of the other three groups.

Ethnic outlets were evaluated in terms of importance and proximity, and compared to conventional stores to determine respondents' preferences. A majority (59% or more) of respondents in each sub-group indicated that they were "more willing" to purchase ethnic produce from ethnic outlets (although fewer Hispanics than indicated this actually frequented ethnic grocery stores; this suggests that lack of availability of an ethnic outlet may be an issue). More than 70% and 80% of respondents in each sub-group live within ten and twenty miles, respectively, of an ethnic grocery store. Ethnic outlets were consistently rated favorably ("better") for selection and price by consumers in each sub-group. In comparison, consumers in each sub-group were more indifferent to outlet type with regard to freshness, quality and packaging. However, freshness and quality were consistent priorities among all ethnic groups (although they may not have been "better" in one outlet type versus another). Selection was consistently the third most common important attribute by all sub-groups, followed closely by store availability and price, and then language and packaging. Promotions and/or advertisements for ethnic produce were more effective with Hispanics than Asians (influenced 90% or more Hispanics as compared to roughly half of Chinese and two thirds of Asian Indian respondents).

Survey data on respondent willingness assessed consumers' inclination to purchase based on (or receptiveness to) certain attributes, as well as their willingness to pay a premium for ethnic produce. Roughly half or more of respondents in each sub-group were receptive to locally or organically grown ethnic produce. 28% of Asian Indians were receptive to new ethnic produce items or country of origin labeling, as compared to half or more of respondents in other three sub-groups. A majority from each sub-group were "less willing" to purchase genetically modified produce. Half or more of respondents from each sub-group were willing to a premium for ethnic produce, relative to American substitutes. Moreover, roughly one quarter (from each group) will pay a maximum of up to 5%, 5% to 21% from each group will pay a maximum premium of 6-10%, 8% to 15% from each group will pay a maximum premium of 11-20%, and 13% will pay a maximum premium of more than 20%. In general, Asian Indians were slightly less likely to pay premiums than the others.

Respondents' monthly produce expenditure estimates of both ethnic and total produce (i.e. ethnic and American combined) averaged $26 and $37 per month, respectively (across all groups). The Chinese group was at the high extreme for each ($32 ethnic and $48 total) and Mexicans were at the low extreme ($22 ethnic and $31 total). The ethnic produce accounted for more than 60% of total produce expenditures for each group (with Asian Indians at the high extreme at 82%). Ethnic produce expenditures per person were extrapolated to the larger populations for each respective ethnicity, to arrive at the following ethnic produce market estimates along the East Coast (within a 90% confidence interval, with a margin of error of 5.6% or better); Chinese: $245M to $296M per annum, Asian Indian: $190M to $230M per annum, Mexican: $281M to $362M per annum, and Puerto Rican: $531M to $655M per annum.

Select produce items for each ethnicity, deemed feasible for production in this region, were ranked on the basis of consumer purchases, to prioritize future research efforts, so that producers may to begin to address these sizeable local ethnic markets in a more effective manner. Multiple criteria were established to rank produce items and allow for

comparisons across produce items of various unit types (i.e. pounds, bunches, and numbers). The surveyed demand criteria included average expenditures, frequency of purchase, and volume of purchase. In addition to the surveyed demand, crops were also evaluated for production research potential (research interest, yield potential, and anticipated cost effectiveness) by production trial participants in three states. The following crops were selected accordingly and entered into production trials;

Chinese	Asian Indian	Mexican	Puerto Rican
Baby pak choy	Bottle gourd	Chili Jalapeno	Aji Dulce
Oriental eggplant	Eggplant (Raavayya)	Tomatillo	Batata
Smooth luffa	Eggplant (Bharta)	Calabacita	Pepinillo/Bitter gourd
Edamame	Ridged gourd	Chili Pablano/Ancho	Cilantro/Coriander
Napa cabbage	Fenugreek leaves		
Oriental spinach	Mint leaves		
Pak choy			
Snow peas			

Demonstration and research trials began in 2006 and will ultimately be established at six sites located in three states along the East Coast (two in Florida, one in Massachusetts, and three in New Jersey). Trials are to be conducted at each location for two seasons. Due to varying climates, production seasons vary from site to site and special attention to variations in yield and quality of produce, as may be affected by season and geographic location, is warranted. Crop quality and yield parameters will be evaluated statistically to determine suitability for commercial production and develop recommendations for geographic sequencing of production, by month/season, to sustain a twelve month production supply in the eastern United States. Information from the production trials will be combined with case study findings to make final crop recommendations and communicated accordingly to East Coast farmers. Additional demand analysis will be conducted to model ethnic consumer expenditures and demographics relative to patterns, preferences, and practices. This will support grower efforts to target specific ethnic markets based on unique demographic profiles and help marry supply with local demand to optimize marketing efforts. Completion of the study is targeted for 2009.

1. INTRODUCTION

Economic opportunities have arisen in the last decade for specialty crop agriculture catering to the ethnically diverse consumers (Govindasamy et al. 2006; Mendonca et al. 2006**;** Sciarappa, 2001-2003; Tubene, 2001). United States Census data show overall average population increases of 13% from 1990 to 2000 as compared to 48% for Asians and 58% for Hispanic/Latinos (Census 1990, 2000). The ethnic population boom along the East Coast is even more pronounced. In ethnically diverse population hubs such as the Northeast Region, the Asian population growth reached 60%. Similarly growing Hispanic populations are geographically dispersed along the East Coast, with just five states (FL, GA, NY, NC, and NJ) accounting for over one fifth of the nation's Hispanic population growth and yielding a combined growth rate of 59%. The rapid expansion of ethnic populations presents significant opportunities for fruit and vegetable producers in the region to take advantage of their close proximity to densely populated areas. To help East Coast farmers remain economically viable, this U.S. Department of Agriculture, National Research Initiative study was undertaken to document and quantify the current market for selected ethnic vegetables. Assessing demand allows farmers to target crops with the highest potential return.

A bilingual survey of four predominant and growing ethnic groups, specifically; Chinese, Indian, Mexican and Puerto Rican was prepared. Two hundred seventy-one randomly selected East Coast residents from each selected ethnicity completed the survey, totaling 1,084 samples. Crop production experts along the East Coast from Florida to Massachusetts narrowed this list based upon production considerations. The ethnic consumer surveys indicated produce purchasing preferences of the top 10-12 crops for each group which helped refine selections for field trialing.

The general objectives of this study are to:

1) identify and estimate the market size for ethnic segments that present significant opportunities to local growers;

2) assess demand, conduct production studies, and make recommendations for appropriate ethnic produce items to locally address this market; and
3) develop strategies and production timelines to coordinate production of select ethnic crops to exploit this market niche.

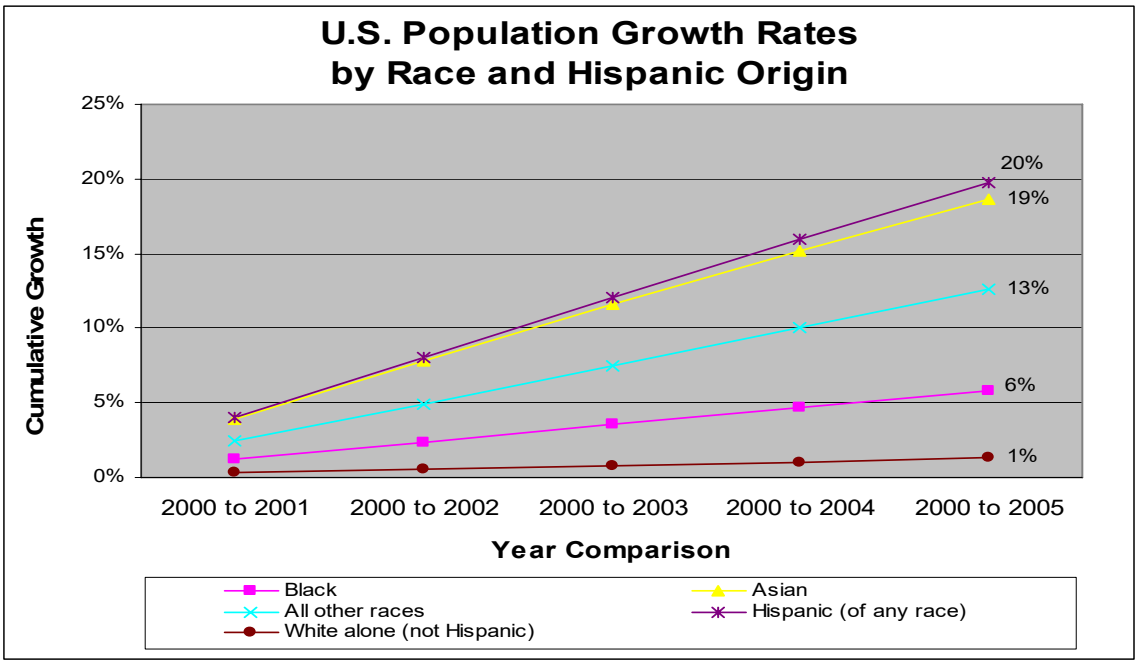
The intended outcome of the project is to generate and distribute science-based information about production, marketability, and utilization of selected ethnic crops. This initiative bridges the supply-demand gap by delivering alternative, practical solutions to economic problems faced by many vegetable growers and contributing to the nutritional and health needs of regional consumers.

This study analyzes the survey results to assess the demand, quantify the market, and recommend appropriate crops for production trials in order to address the supply-demand gap (Phase I). The balance of the overall project objectives which include production crop recommendations, strategies, and timelines (Phase II) will be provided in a separate publication, after production trials are completed, to deliver science-based supply-side recommendations.

2. RESEARCH APPROACH

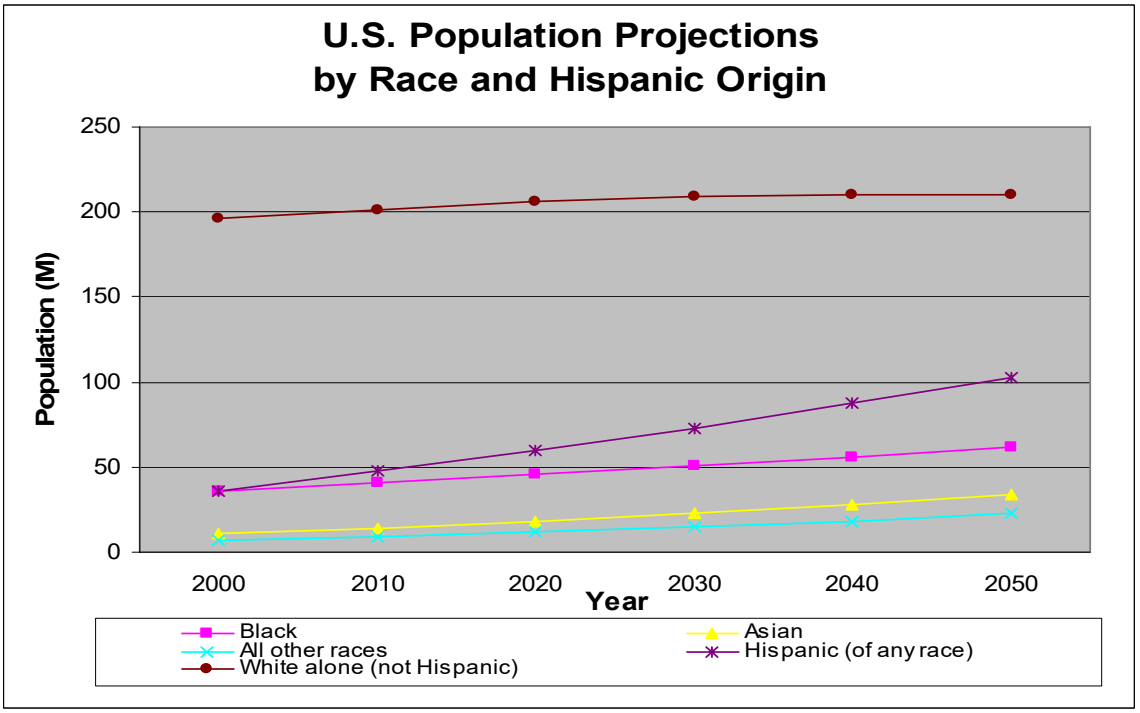
National trends. Opportunities to capture anticipated market growth in certain ethnic markets were identified, specifically for ethnic market segments growing at faster rates than their ethnic and/or non-ethnic counterparts and for which growth is expected to continue. The primary groups meeting these criteria included Asians and Hispanics (recent rate of growth; Fig. 2.1. and continued growth expectations; Fig. 2.2.). The top two fast growing sub-groups within each of these segments were chosen for the study; Chinese and Asian Indian (Asian sub-groups) and Puerto Rican and Mexican (Hispanic sub-groups). The demographic profiles for these ethnic populations differ from the national averages for all Americans (predominantly White Americans), across many general, social, and economic characteristics which may influence their buying and consumption behaviors (Census 2000; American Factfinder – Demographic Profile Highlights; Table 2.1).

Figure 2.1. Recent U.S. Population Growth Rates



Source: Population Estimates; April 1, 2000 to July 1, 2005, Population Division, U.S. Census Bureau, 2006

Figure 2.2. Projected Trends in U.S. Population



Source: "U.S. Interim Projections by Age, Sex, Race, and Hispanic Origin", U.S. Census Bureau, 2004

Table 2.1. National Total, White, and Ethnic Population Demographics

Census 2000 Demographic Profile Highlights

General Characteristics	Total Population	White (alone)	Chinese (alone)	Asian Indian (alone)	Mexican (alone)	Puerto Rican (alone)
Total population	281,421,906	211,460,626	2,432,585	1,678,765	20,640,711	3,406,178
Male	138,053,563	103,773,194	1,176,913	893,095	10,930,467	1,659,505
Female	143,368,343	107,687,432	1,255,672	785,670	9,710,244	1,746,673
Median age (years)	35	38	35	30	24	27
Under 5 years	19,175,798	12,859,892	149,193	134,533	2,385,936	319,434
18 years and over	209,128,094	161,862,337	1,913,278	1,259,337	12,968,321	2,243,786
65 years and over	34,991,753	30,405,538	235,995	66,834	809,842	191,295
Household population	273,643,273	206,127,572	2,383,622	1,646,806	20,265,643	3,312,878
Group quarters population	7,778,633	5,333,054	48,963	31,959	375,068	93,300
Average household size	3	2	3	3	4	3
Average family size	3	3	3	4	4	3
Occupied housing units	105,480,101	83,764,021	803,746	536,883	4,941,782	1,079,855
Owner-occupied housing units	69,815,753	59,693,948	469,583	252,100	2,387,478	373,497
Renter-occupied housing units	35,664,348	24,070,073	334,163	284,783	2,554,304	706,358

Social Characteristics	Total Population	White (alone)	Chinese (alone)	Asian Indian (alone)	Mexican (alone)	Puerto Rican (alone)
Population 25 years and over	182,211,639	143,085,659	1,662,423	1,045,644	10,178,093	1,842,900
High school graduate or higher	146,496,014	119,587,422	1,280,259	906,483	4,662,491	1,166,324
Bachelor's degree or higher	44,462,605	37,291,563	798,828	668,029	759,375	230,181
Civilian veterans (civilian population ≥18 years)	26,403,703	22,573,027	43,600	13,797	612,519	187,475
Disability status (population 5 years and over)	49,746,248	36,158,505	310,124	228,898	3,597,913	762,842
Foreign born	31,107,889	13,376,204	1,716,682	1,240,755	8,677,303	47,128
Male, Now married, except separated (population 15 years and over)	60,720,716	49,191,373	595,273	450,341	4,002,846	521,739
Female, Now married, except separated (population 15 years and over)	59,510,557	48,548,635	640,853	423,137	3,600,601	507,064
Speak a language other than English at home (population 5 years and over)	46,951,595	22,631,600	1,943,644	1,222,397	14,590,015	2,329,611

Economic Characteristics	Total Population	White (alone)	Chinese (alone)	Asian Indian (alone)	Mexican (alone)	Puerto Rican (alone)
In labor force (population 16 years and over)	138,820,935	108,079,326	1,231,698	861,679	8,636,635	1,394,594
Mean travel time to work in minutes (workers 16 years and over)	26	25	31	28	26	29
Median household income in 1999 (dollars)	41,994	44,687	51,444	63,669	33,621	30,644
Median family income in 1999 (dollars)	50,046	53,356	60,058	70,708	33,516	32,791
Per capita income in 1999 (dollars)	21,587	23,918	23,756	27,514	10,918	13,518
Families below poverty level	6,620,945	3,548,532	60,878	27,947	877,445	189,109
Individuals below poverty level	33,899,812	18,847,674	320,577	157,516	4,814,500	853,443

Source: U.S. Census Bureau, Summary File 2 (SF 2) and Summary File 4 (SF 4)

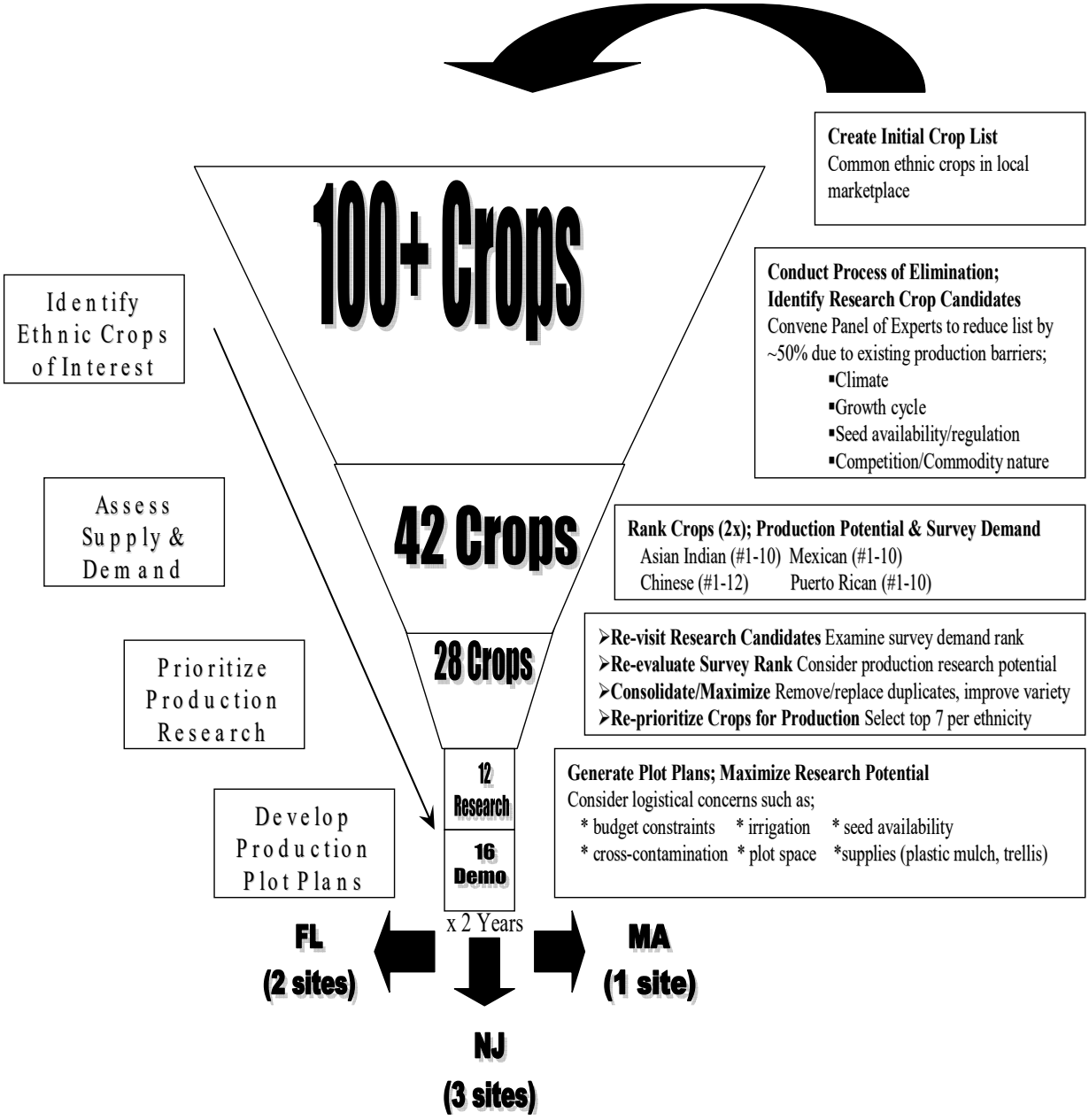
Rationale and Significance. Despite the competitive disadvantages relative to year-round producers in western production areas, significant comparative advantages exist for local East Coast growers as a result of their proximity to densely populated areas rich in ethnic diversity (Govindasamy, Nemana, Puduri, Pappas, 2006). Increasingly, these producers adopt new crops or create new value-added products in order to remain economically viable. Growing ethnic crops presents opportunities for producers to exploit existing comparative advantages associated with serving densely populated local ethnic markets in order to increase profitability and sustain farming operations. The coordination of production and marketing are critical to avoid the threats of rapid over-production (which can quickly lead to depressed prices) and to overcome inadequate marketing infrastructure in order to move product into community markets. Establishing or extending existing cooperative marketing associations along the East Coast, from North to South, can create an improved market system that provides appropriate year-round supplies to the area.

*Data Collection***.** The research program included the development, administration, and data collection from an ethnic consumer survey. The survey objective was to gather relevant consumer information from four ethnic groups (Chinese, Indian, Mexican, and Puerto Rican) to include demographics, shopping patterns, preferences and opinions, related practices, willingness to pay premiums over traditional American produce, and typical produce expenditures. The data collected was utilized to analyze ethnic consumers' patterns of purchase and propensity to purchase ethnic produce, estimate the associated market potential, and prioritize subsequent production studies of individual crops in order to make recommendations for local production.

Market Estimation and Production Research. The survey expenditure data collected included both respondent estimates of average spending on all of their produce, ethnic and total (including conventional American), and specific purchase data on selected ethnic produce items. The total produce expenditure data provided the data necessary to estimate the respective ethnic produce markets for each of the four ethnicities of study. The ethnic produce item specifics helped to guide decisions for production research trials.

The 42 produce items included in the survey questionnaire were selected based on relevant production considerations from an initial list of over 100 ethnic crops, as a result of a crop expert panel review. The surveyed crop list was further refined and prioritized based on the survey results (Fig. 2.3.).

Figure 2.3. Crop Selection Process



3. ETHNIC CONSUMER SURVEY

3.1. Sample and Method

Samples for each ethnicity were identified based on 2000 Census populations for Chinese, Asian Indians, Mexicans and Puerto Ricans in the 16 East Coast states and the District of Columbia (Table 3.1.). 271 surveys for each of the four ethnic groups were statistically determined for a total of 1,084 surveys of ethnic produce consumers. (The sampling error associated with an East Coast sample of 271 people from each of the four ethnic groups is approximately ±5% with a 90% confidence interval.)

Table 3.1. East Coast Ethnic Populations

(United States Census 2000)

	ETHNIC GROUP			
STATE	Chinese	Asian Indian	Mexican	Puerto Rican
Connecticut	19,172	23,662	23,484	194,443
Delaware	4,128	5,280	12,986	14,005
District of Columbia	3,734	2,845	5,098	2,328
Florida	46,368	70,740	363,925	482,027
Georgia	27,446	46,132	275,288	35,532
Maine	2,034	1,021	2,756	2,275
Maryland	49,400	49,909	39,900	25,570
Massachusetts	84,392	43,801	22,288	199,207
New Hampshire	4,074	3,873	4,590	6,215
New Jersey	100,355	169,180	102,929	366,788
New York	424,774	251,724	260,889	1,050,293
North Carolina	18,984	26,197	246,545	31,117
Pennsylvania	50,650	57,241	55,178	228,557
Rhode Island	4,974	2,942	5,881	25,422
South Carolina	5,967	8,356	52,871	12,211
Vermont	1,330	858	1,174	1,374
Virginia	36,966	48,815	73,979	41,131
TOTAL	**884,748**	**812,576**	**1,549,761**	**2,718,495**

Further sample size requirements were established, based upon ethnic group by state in accordance with a stratified random sampling method (stratified random sampling was used where the sample is selected such that ethnic groups are represented in the same respective proportion, by state, as they occur in the population, per Census 2000), with a minimum requirement of one sample per state for each ethnic group. An additional sample size of 271 was established, irregardless of state and ethnic group, to gather data in a short survey delivered to non-purchasers of ethnic produce to assess their reasons for not purchasing these items and determine their willingness to buy ethnic produce based upon the availability of certain attributes.

3.2. Implementation and Outcomes

Administration. An outsourced firm specializing in telephone and internet data collection, The Wats Room Incorporated (WATS), was contracted to conduct 1,355 telephone interviews using Computer-Assisted Telephone Interview (CATI) technology. Their surveys were conducted by phone to ensure that a statistically significant randomized sample was obtained. This entailed targeting and achieving the required sample sizes by ethnicity and state while minimizing any costs associated with sample surpluses in certain states and deficits in others (as might occur with a mail-administered survey). The phone-administered questionnaires were to be completed by the principal grocery shopper in each household, as identified by each respondent with prompting from the interviewer.

Qualified (bi-lingual) interviewers received on-site Human Subjects Certification Program (HSCP) training, per Federal Assurance guidelines, in addition to survey-specific training and practice, prior to conducting actual interviews. (HSCP includes background material on human subject research which includes history, policies, regulations, procedures and ethical practices.) A member of the Rutgers research team was on-site at WATS in Rochelle Park, New Jersey during this training to monitor the process, tour the facility, and oversee operations. Ongoing interviewer monitoring throughout the field period was conducted by WATS. Interviewing commenced in late

February 2006, continued into March, with initial results available by the end of March and final data files provided in early May, 2006.

Response Rate. Over 13,000 potential interviewee leads were utilized by WATS in order to meet the sample size requirements. These leads were generated via marketing-based consumer data (combination of ethnic surnames and market data), selected using a randomized selection process, and further randomized through CATI programming. Ultimately, a total of 1,366 phone surveys were completed by ethnic consumers as follows; 1,084 long-version surveys by purchasers of ethnic produce (271 ethnic produce purchasers from each of the four ethnicities surveyed; Chinese, Asian Indian, Mexican, and Puerto Rican) and 282 short-version surveys by non-purchasers of ethnic produce (defined as not having purchased within the past year), irrespective of ethnic group (Table 3.2.). Roughly 10% of the numbers selected at random for each ethnic group yielded complete interviews (Table 3.3.). However, many of telephone numbers originally selected were non-residential or non-working numbers. Removal of these numbers from the equation reveals that 14% of the calls to working residential numbers resulted in completed interviews. Many multiple call attempts to working residential numbers were unsuccessful in contacting the principal grocer shopper in the house, as required for the survey interview. Surveys were conducted between 5 pm and 9 pm EST to accommodate those shoppers that work a traditional workday. Despite repeat call attempts of up to 10 telephone calls and/or three appointment setting follow-ups per number, many qualified interviewees could not be reached. The cooperation rate, or completed interviews as a percent of calls to a qualified (accessible) interviewee, was approximately 37% (the cooperation rate is defined for these purposes as completed interviews as a percentage of the sum of completed interviews, refusals, and language barriers cited).

Table 3.2. Ethnic Consumer Survey Respondent Summary

STATE	ETHNIC GROUP				
	Chinese	Asian Indian	Mexican	Puerto Rican	Total
Connecticut	6	8	4	19	37
Delaware	1	2	2	1	6
District of Columbia	1	1	1	1	4
Florida	14	23	63	46	146
Georgia	8	15	48	4	75
Massachusetts	26	15	4	20	65
Maryland	15	17	7	3	42
Maine	1	1	1	1	4
North Carolina	6	9	43	3	61
New Hampshire	1	1	1	1	4
New Jersey	31	56	18	36	141
New York	130	83	45	104	362
Pennsylvania	15	19	10	23	67
Rhode Island	2	1	1	3	7
South Carolina	2	3	9	1	15
Vermont	1	1	1	1	4
Virginia	11	16	13	4	44
Purchasers*	271	271	271	271	1,084
Non-purchasers**	107	36	105	34	282
Total Surveys	**378**	**307**	**376**	**305**	**1,366**

** Purchasers are respondents that indicated they have purchased ethnic fruits and vegetables within the past 12 months.*

*** Non-purchasers are respondents that indicated they have not purchased ethnic fruits and vegetables within the past 12 months.*

Table 3.3. Ethnic Consumer Survey Administration

Ethnic Produce Survey
Summary & Call Completion Analysis

COMPLETED SURVEYS

	Chinese	Asian Indian	Mexican	Puerto Rican	Total
Purchasers	271	271	271	271	1,084
Non-purchasers	107	36	105	34	282
TOTAL	**378**	**307**	**376**	**305**	**1,366**

	CALL COMPLETION ANALYSIS					
a	Complete surveys	378	307	376	305	1,366
b	Total number of leads	3,505	3,514	3,421	2,790	13,230
	Non-residential or Non-working #s:	*550*	*700*	*1,454*	*882*	*3,586*
c	Working Residential #s (refusals, language, live, max calls & complete surveys)	2,955	2,814	1,967	1,908	9,644
d	Refusals	669	739	221	245	1,874
e	Language Barriers (including deaf)	199	121	85	23	428
f	Live (i.e. at least one call attempt made; active phone # determination)	1,605	1,622	393	876	4,496
g	Maximum calls (limit of 10 calls and/or 3 appointment setting follow-ups)	104	25	892	459	1,480
a/b	Completion Rate = Complete/Total numbers selected	11%	9%	11%	11%	**10%**
a/c	Rigid Response Rate = Complete/Working Residential #s	13%	11%	19%	16%	**14%**
a/(a+d+e)	Cooperation Rate = Complete/(Complete + Refusals + Language Barrier)	30%	26%	55%	53%	**37%**

Nuances of Ethnic Languages and Crop Names. The surveys were administered by trained, bilingual phone interviewers in order to minimize response bias due to potential language barriers. The interview languages made available were as follows; (1) Chinese interviews offered/conducted in English, Mandarin, and Cantonese; (2) Indian interviews offered/conducted in English and Hindi; and (3) Mexican and Puerto Rican offered/conducted in English and Spanish (reflective of respective dialect differences between the two countries of origin; used, as needed, according to interviewer confirmation of respondent's country of origin).

Both the targeted call completion time for ethnic produce purchasers and the estimated completion time by WATS, prior to survey implementation, were under twelve minutes. Average completion times by ethnic group actually ran up to three minutes longer, depending on ethnicity, with the Asian (Chinese/Indian) segments being at the long extreme and the Hispanic (Mexican/Puerto Rican) segments closer to the original estimate (minutes; 15.39 Chinese, 13.64 Indian, 12.48 Mexican, 12.31 Puerto Rican). A greater need for language/translation assistance, particularly for crop name recognition, by Asian versus Hispanic interviewees were the primary reason for extended call times. In anticipation of such crop name recognition issues, the bi-lingual interviewers were prepared in advance of survey implementation to address these crop name recognition issues and mitigate any potential reduction in survey completions. Interviewers were provided with additional crop name variations and/or crop pictures to ensure interviewer crop familiarity and increase their ability to ensure the same for survey respondents. Despite longer interview times experienced by Asians, as compared to their Hispanic counterparts, the call completion rates were similar across groups (between 9% and 11% for all 4 groups surveyed).

3.3. Ethnic Crops of Study

Initial Ethnic Crop List. An initial list of ethnic crops commonly sold and/or marketed and considered as ethnic produce items for each of the four ethnic groups of study was compiled based upon a combination of focus groups and identification through related research (Govindasamy, 2006).

Process of Elimination. To determine which crops from the initial list to include in the survey, a panel of twelve marketing, field/extension, and crop specialists scrutinized the list of ethnic crops to eliminate those with existing production barriers that could impede their local production and/or marketplace success. Production barriers included local climate limitations, growth cycle (relatively short cycle necessary to grow in designated East Coast production sites), lack of seed supply due to regulatory issues, and local competition and/or commodity nature of certain produce items. Thus, fresh market specialty vegetable crops were given priority over less-perishable crops such as beans and certain peppers used primarily as spices.

This process reduced the survey crop candidate list to 42 crops (10 each for Asian Indian, Mexican, and Puerto Rican, and 12 for Chinese) to assess demand. Due to budgetary constraints, the list required further reductions to arrive at a final list of approximately 28 crops to be included in subsequent production research. Assessment of the survey results and additional production considerations were used to prioritize and make final selections for field trials.

3.4. Data Limitations

The consumer survey was not intended to collect information on *non-ethnic produce* (i.e. conventional American) purchases by *ethnic consumers*. The survey data for ethnic produce purchasers (271 samples per ethnicity) does include a respondent's typical total produce expenditure, as well as average ethnic produce spending, but does not include any detail on what comprises the difference. The shortened survey data from the additional sample of 271 'non-purchasers' was gathered to facilitate future marketing efforts to capture some of this demand potential, where appropriate. It was not intended to gather information on any non-ethnic produce items they may currently purchase.

The questionnaire did not address *ethnic produce* demand by *non-ethnic consumers* of ethnic produce as the assessment of this market demand segment is out of the scope of this study. However, high demand for many ethnic foods by mainstream and specialty buyers presents significant opportunities for producers, distributors, and retailers of ethnic produce, and suggests that the benefits of local production and promotion of crop recommendations from this research could extend well beyond the ethnic market potential quantified in this study.

The ethnic crops selected for survey inclusion did not necessarily represent the *most* popular or *largest* demand among ethnic produce items. Rather, they were identified as common sellers throughout the East Coast and were considered strong candidates for local production and market success. The survey results determined which of these crops

had the highest demand potential among current ethnic produce consumers. Production trials will help to determine the economic viability of local production.

4. SURVEY RESULTS

Survey Outline; Sequence and Content. Two sets of data were collected, according to the two versions of the survey; long and abridged. The questionnaire was designed to first assess whether the ethnic respondent was a consumer of ethnic produce (in the past twelve months) or not, using a "yes" or "no" screening question (see Appendix: Ethnic Consumer Survey; Outline and Questionnaire). Then a skip sequence was used by the interviewer, depending on the interviewee's response, to either; if *"yes"*, continue with a line of questioning that will help to identify ethnic produce demand factors, or if *"no"*, identify reasons for not purchasing ethnic produce (potential market opportunities) and assess the possibility of future purchases (the survey question numbers are provided next to each corresponding results section that follows).

The long version of the survey (completed by purchasers only) was intended to gather demand *and* marketing information inclusive of the proverbial "4 P's" of marketing (Product, Placement, Price, and Promotion). The results of these surveys were used to assess the market demand for the respective high-potential ethnic markets, and to direct subsequent research (i.e. prioritize production crops) to satisfy and/or capture some of this demand. The abridged survey version (completed by "non-purchasers", irrespective of ethnic group), was collected to ascertain reasons for non-purchase and identify potential new, extended opportunities to exploit these markets. This shortened version gathered primarily the promotion and placement preferences, to maximize the marketing reach of the initial project efforts by attempting to address such underserved markets.

4.1. Purchasers of Ethnic Produce

The "purchasers" (respondents answering question 1a in the affirmative, i.e. having "purchased any ethnic fruits or vegetables over the past twelve months") proceeded to complete the longer form of the survey, inclusive of demographic information, questions about their shopping patterns (frequency, spending, point of purchase, quantity, price, and

average expenditures), and preferences and opinions with regard to product, placement, price, and promotion (four marketing 'P's). Such inquiries were made to profile ethnic consumers, assess the importance (consumer perceptions) of product and store attributes in their purchasing decisions, determine their willingness to pay for and respond to ethnic produce promotion, and quantify their existing ethnic produce demand.

4.1.1. Consumer Characteristics

Demographic inquiries were made with regard to neighborhood, residency, household size and composition, and other typical socio-demographic data (age, education, income, etc.). In addition, information such as birthplace, age of immigration to the United States (or not), length of residency in the United States, current neighborhood type, and ethnic language fluency was collected to measure acculturation. The responses were summarized, by ethnic group, and compared to national averages for the entire United States population, and respective national ethnic populations, where applicable and appropriate (Census 2000; American Factfinder – Demographic Profile Highlights; Table 2.1), to highlight respondent characteristics somewhat unique to ethnic populations.

General Characteristics

Gender (Question 25). A majority of principal shoppers from each ethnic group were female (Table 4.1). A slightly higher portion of respondents from the Hispanic sub-groups were female (75% and 77% of Mexicans and Puerto Ricans, respectively), as compared to the Asian sub-groups (66% and 63% of Chinese and Asian Indians, respectively). However, despite the marginal to slightly lower proportion of females represented by the national populations for each of these ethnic groups, (females represent 51% to 52% of Chinese and Puerto Rican populations, as well as the overall and White populations, and 47% of each of the Asian Indian and Mexican populations; Table 2.1), a relatively significant majority of principal household grocery shoppers from each ethnic group surveyed were female.

Table 4.1. Ethnic Consumer Respondents by Gender

Gender	Ethnicity			
	Chinese	Asian Indian	Mexican	Puerto Rican
	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)
Female	178 (66%)	170 (63%)	204 (75%)	209 (77%)
Male	93 (34%)	101 (37%)	67 (25%)	62 (23%)
Total	271 (100%)	271 (100%)	271 (100%)	271 (100%)

Age (Question 20). The predominant age group, out of the survey choices provided (<20, 21-35, 36-50, 51-65, and >65 years), was 36 to 50 years of age for all four ethnic groups (Table 4.2). Between 37% and 47% of respondents in each ethnic group fell into this age category. Almost as many respondents from the respective Asian Indian, Mexican, and Puerto Rican groups fell into the slightly younger age category of 21 to 35 years of age (34%, 41%, and 41% of Asian Indians, Mexicans, and Puerto Ricans respectively), as compared to roughly half as many from the Chinese group (19%). In contrast, the Chinese had more respondents over 50 years of age than the other three ethnic groups, with a similar number of respondents as Asian Indians in the 51 to 65 years of age category. At the other age extreme, a mere 5% or less of respondents from each group were under 20 years of age. The higher percentage of older Chinese respondents, relative to the other groups, is consistent with a higher median age for Chinese and the overall population, relative to the other three ethnic populations at a national level (35 years of age for Chinese, equal to the national average for the entire US, as compared to 30, 24, and 27 years for Asian Indians, Mexicans, and Puerto Ricans, respectively, Table 2.1). Moreover, the age distribution of respondents seemingly corresponds with the respective national median for each population group (i.e. younger respondents from the Hispanic sub-groups consistent with the lower national median ages as compared to the overall and white populations; the distribution of respondents from the Asian sub-groups at or approaching the respective national and overall/White averages, with more Chinese in the 65 years and over than the other ethnic groups surveyed).

Table 4.2. Ethnic Consumer Respondents by Age

Age Distribution	Ethnicity			
	Chinese	Asian Indian	Mexican	Puerto Rican
	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)
<20	5 (2%)	5 (2%)	14 (5%)	8 (3%)
21 to 35	48 (19%)	83 (34%)	108 (41%)	108 (41%)
36 to 50	117 (47%)	92 (37%)	111 (43%)	115 (43%)
51 to 65	54 (22%)	54 (22%	25 (10%)	32 (12%)
Over 65	25 (10%)	12 (5%)	3 (1%)	3 (1%)
Total	249 (100%)	246 (100%)	261 (100%)	266 (100%)

Household size (Question 18). 61% to 70% of respondents from each group have two to four members in their household (Table 4.3). Another 20% to 30% from each group have five to seven household members, with more Mexicans at the higher extremes. 5% to 9% from each group live alone. 3% or less from each group has more than seven members in their household. These ethnic figures seem to correspond with the respective national average household sizes; three members for the Chinese, Asian Indian, and Puerto Rican groups and a slightly higher national average of four members for Mexicans.

Table 4.3. Ethnic Consumer Respondents by Household Size

Household Size	Ethnicity			
	Chinese	Asian Indian	Mexican	Puerto Rican
	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)
1	18 (7%)	22 (9%)	14 (5%)	21 (8%)
2-4	181 (70%)	167 (65%)	166 (62%)	163 (61%)
5-7	52 (20%)	62 (24%)	80 (30%)	74 (28%)
8-10	4 (2%)	5 (2%)	6 (2%)	9 (3%)
10+	2 (1%)		2 (1%)	
Total	257 (100%)	(256) (100%)	268 (100%)	267 (100%)

Number of household member under 18 years of age (Question19). Roughly half of the respondents in the Asian sub-groups and a third of respondents in the Hispanic sub-groups did not have members below the age of 18 years in their households (Table 4.4). 19% to 23% from each group had one person under the age of 18 in their household, and another 17% to 25% had two members of their household of this age. 21% or less from each group had three or more household members under the age of 18, with 3% or less from each group having more than four children in their household.

Table 4.4. Ethnic Consumer Respondents by Household Composition (Number of Children)

People Below 17 years Age	Ethnicity			
	Chinese	Asian Indian	Mexican	Puerto Rican
	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)
0	137 (52%)	131 (51%)	96 (36%)	87 (33%)
1	59 (23%)	50 (19%)	55 (21%)	60 (22%)
2	47 (18%)	60 (23%)	67 (25%)	63 (24%)
3	13 (5%)	11 (4%)	32 (12%)	34 (13%)
4	4 (2%)	4 (2%)	12 (4%)	14 (5%)
5	1 (0%)	1 (0%)	3 (1%)	5 (2%)
6			1 (0%)	2 (1%)
7	1 (0%)		1 (0%)	1 (0%)
8				1 (0%)
Total	262 (100%)	257 (100%)	267 (100%)	267 (100%)

Social Characteristics

Education level (Question 21). 16% or less from each group did not complete high school (Table 4.5). More than half of the respondents from each group completed *some* college (at least 2 or more years). Roughly half (46%) of Chinese respondents and two-

thirds (67%) of Asian Indian respondents, completed at least a four year college, as compared to roughly one-third of respondents from each of the Hispanic sub-groups (i.e. Asian Indian four year college graduates at approximately double the Hispanic respondent percentages). The lower number of Hispanic graduates with a four year degree or higher was primarily offset by a higher number of Hispanic graduates with a two year college degree relative to the Asian sub-groups. Still, the one-third of East Coast Mexican and Puerto Rican respondents that completed at least a four year college was relatively high, as compared to the nation-wide 7.5% and 12.5% for Mexicans and Puerto Ricans, respectively (from respective 'Bachelor's degree or higher', relative to 'Population 25 years or over' figures in Table 2.1).

Table 4.5. Ethnic Consumer Respondents by Education Level

Education	Ethnicity			
	Chinese	Asian Indian	Mexican	Puerto Rican
	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)
Less than 12th grade	38 (15%)	16 (6%)	41 (16%)	19 (7%)
High school graduate	78 (32%)	39 (15%)	80 (31%)	102 (38%)
2 year college degree	16 (7%)	27 (11%)	54 (21%)	55 (21%)
4 year college degree	53 (22%)	91 (36%)	49 (19%)	58 (22%)
Post graduate/ advanced degree	61 (25%)	79 (31%)	38 (15%)	33 (12%)
Total	246 (100%)	252 (100%)	262 (100%)	267 (100%)

Marital Status (Question 24). More than half of the respondents from each group were married (ranging from 52% to 85% with Puerto Ricans and Chinese at the respective extremes; Table 4.6). Less than 30% from each group are either single, divorced, separated, or widowed, with 11% or less of each group in any of these categories other than 'single' ('single' ranged from 10% to 29% with Chinese and Puerto Ricans at the

respective extremes). The percentages of married respondents from each group was fairly consistent with the respective national averages, with roughly half or more from each ethnic group reported as 'married'. Also consistent with the national averages, the married percentages for all surveyed groups, except for Puerto Ricans, exceed the roughly two thirds of the overall (and 'White alone') 'married' national averages (from respective 'Male' or 'Female', 'Now married, except separated - population 15 years and over', relative to 'Population 18 years or over' figures in Table 2.1). Slightly higher percentages of Puerto Ricans are single or divorced relative to Mexicans, Asian Indians, and Chinese (in that order, i.e. least to most difference).

Table 4.6. Ethnic Consumer Respondents by Marital Status

Marital Status	Ethnicity			
	Chinese	Asian Indian	Mexican	Puerto Rican
	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)
Married	222 (85%)	211 (83%)	185 (71%)	138 (52%)
Single	25 (10%)	34 (13%)	52 (20%)	78 (29%)
Divorced	5 (2%)	4 (2%)	13 (5%)	28 (11%)
Separated	1 (0%)		7 (3%)	15 (6%)
Widower	9 (3%)	5 (2%)	5 (2%)	3 (1%)
Other				3 (1%)
Total	262 (100%)	254 (100%)	262 (100%)	265 (100%)

Economic Characteristics

Employment (Question 22). Just over half (54% to 60%) of respondents from each group are employed by someone other than themselves (Table 4.7). 4% to 15% are self-employed, bringing the employed totals to 64% or higher from each group. With the exception of 17% of Chinese who were retired, 10% or less from each group was either retired, a full-time homemaker, unemployed or 'other'. The higher percentage of retired

Chinese, relative to retirees from other groups, is seemingly correlated with the higher percentage of older (more than 50 years of age) Chinese respondents.

Table 4.7. Ethnic Consumer Respondents by Employment Status

Employment Status	Ethnicity			
	Chinese	Asian Indian	Mexican	Puerto Rican
	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)
Employed by someone else	154 (60%)	134 (54%)	158 (60%)	152 (57%)
Self-employed	11 (4%)	37 (15%)	33 (13%)	32 (12%)
Retired	43 (17%	26 (10%)	7 (3%)	13 (5%)
Full-time Home-maker	23 (9%)	33 (13%)	39 (15%)	38 (14%)
Un- employed	16 (6%)	14 (6%)	21 (8%)	27 (10%)
Other	10 (4%)	5 (2%)	5 (2%)	4 (2%)
Total	257 (100%)	249 (100%)	263 (100%)	266 (100%)

Annual household income (Question 23). 16% to 25% of respondents from each group fell into one of the following three annual income categories provided; 'less than $20,000', '$20,000 to $39,999', or '$40,000 to $59,999', with the exception of 6% of Asian Indian respondents who made less than $20,000 per year (Table 4.8). The relatively low percentage of Asian Indian respondents in the lower income category was offset by higher percentages of respondents in every one of the (six) annual income categories beyond $60,000 per year. This is seemingly correlated, and perhaps due to, the higher education levels by Asian Indians relative to the other ethnic groups surveyed. The higher annual income levels by Asian Indians surveyed is consistent with the national median household incomes by Asian Indians which exceed that of Chinese, Mexican, Puerto Ricans, and Whites alone by $10,000 or more annually (Table 2.1).

Table 4.8. Ethnic Consumer Respondents by Annual Household Income

Income	Ethnicity			
	Chinese	Asian Indian	Mexican	Puerto Rican
	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)
Less than $20,000	36 (20%)	9 (6%)	32 (16%)	46 (22%)
$20,000 to $39,999	43 (24%)	24 (17%)	52 (26%)	57 (27%)
$40,000 to $59,999	29 (16%)	30 (22%)	50 (25%)	43 (21%)
$60,000 to $79,999	22 (12%)	22 (16%)	28 (14%)	24 (11%)
$80,000 to $99,999	18 (10%)	16 (12%)	19 (10%)	14 (7%)
$100,000 to $124,999	20 (11%)	18 (13%)	11 (6%)	15 (7%)
$125,000 to $149,999	7 (4%)	8 (6%)	2 (1%)	3 (1%)
$150,000 to $199,999	2 (1%)	7 (5%)	1 (1%)	2 (1%)
$200,000 or more	3 (2%)	5 (4%)	4 (2%)	5 (2%)
Total	180 (100%)	139 (100%)	199 (100%)	209 (100%)

Acculturation Factors

Country of birth (Question 27). 86% to 87% of the Asian sub-groups surveyed were born in their country of ethnic origin (i.e. China for Chinese; India for Asian Indians) as compared to 29% to 44% of the Hispanic sub-groups (Puerto Rican and Mexican, respectively; Table 4.9). The fewer Hispanics, relative to Asians, from their respective country of ethnic origin is offset by a higher number of American-born Hispanic respondents (55% Mexicans, 69% Puerto Ricans, as compared to 10% Asian Indians and 11% Chinese). 4% or less from all groups was born outside of the United States, in a country other than their respective country of ethnic origin.

Table 4.9. Ethnic Consumer Respondents by Country of Birth

Country of Birth	Ethnicity			
	Chinese	Asian Indian	Mexican	Puerto Rican
	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)
United States	29 (11%)	27 (10%)	148 (55%)	188 (69%)
Country of Ethnic origin	171 (63%)	236 (87%)	118 (44%)	79 (29%)
Other	71 (26%)	8 (3%)	5 (2%)	4 (1%)
Total	271 (100%)	271 (100%)	271 (100%)	271 (100%)

Age of immigration (Question 28). The foreign-born respondents from the Hispanic sub-groups generally arrived to (first resided in) the United States at a younger age than their Asian counterparts (Table 4.10). Roughly half (52%) of the foreign-born Puerto Rican respondents arrived at ten years of age or younger and well over half of foreign-born respondents from both Hispanic sub-groups arrived by twenty years of age (74% and 61% of Puerto Ricans and Mexicans, respectively). More than 85% from each of these Hispanic sub-groups arrived by thirty years of age. In contrast, roughly half of the foreign-born Asian respondents arrived to the United States from 21 to 30 years of age while an additional one-third arrived within ten years (on either side) of this age bracket. 11% or less from each ethnic group arrived in the United States at over forty years of age.

Table 4.10. Ethnic Consumer Respondents by Age at Immigration

Respondent Age upon	Ethnicity			
	Chinese	Asian Indian	Mexican	Puerto Rican
Arrival to U.S.	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)
0-10	9 (5%)	15 (7%)	24 (21%)	42 (52%)
11-20	26 (13%)	54 (26%)	46 (40%)	18 (22%)
21-30	91 (46%)	99 (48%)	29 (25%)	14 (17%)
31-40	52 (26%)	21 (10%)	10 (9%)	5 (6%)
41-50	13 (7%)	15 (7%)	5 (4%)	1 (1%)

51+	8 (4%)	1 (0%)	1 (1%)	1 (1%)
Total	199 (100%)	205 (100%)	115 (100%)	81 (100%)

Length of residency (Question 17). Roughly half of the respondents from each group (ranging from 49% to 63%) have lived in their current city and/or state for ten years or less (Table 4.11). Roughly a quarter of respondents from each group (ranging from 23% to 28%) have done so for eleven to twenty years and another quarter or less (from each) has lived in their current city and/or state for more than twenty years (with a mere 6% or less residing for more than 40 years).

Table 4.11. Ethnic Consumer Respondents by Length of Time at Current Residence (City and State)

Years in Current Location	**Ethnicity**			
	Chinese	**Asian Indian**	**Mexican**	**Puerto Rican**
	Frequency (Percent)	**Frequency (Percent)**	**Frequency (Percent)**	**Frequency (Percent)**
0-10	152 (58%)	155 (59%)	167 (63%)	130 (49%)
11-20	74 (28%)	61 (23%)	62 (23%)	64 (24%)
21-30	30 (12%)	32 (12%)	23 (9%)	32 (12%)
31-40	4 (2%)	11 (4%)	8 (3%)	24 (9%)
41-50			5 (2%)	14 (5%)
51-60		2 (1%)		3 (1%)
Total	260 (100%)	261 (100%)	265 (100%)	267 (100%)

Neighborhood Type (Question 16). Roughly half of the respondents from each of the Asian sub-groups live in urban neighborhoods, while another half or so live in suburban communities, and 7% or less live in rural settings (Table 4.12; Urban; 58% and 46%, Suburban; 40% and 48% of Chinese and Asian Indians, respectively). In comparison, slightly fewer Mexican and Puerto Rican respondents live in urban and suburban

neighborhoods, respectively, offset by higher percentages in rural areas (25% and 18% if Mexicans and Puerto Ricans, respectively).

Table 4.12. Ethnic Consumer Respondents by Neighborhood Type

Neighborhood Type	Ethnicity			
	Chinese	Asian Indian	Mexican	Puerto Rican
	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)
Urban	157 (58%)	124 (46%)	88 (32%)	126 (46%)
Suburban	108 (40%)	129 (48%)	116 (43%)	96 (35%)
Rural	6 (2%)	18 (7%)	67 (25%)	49 (18%)
All	271 (100%)	271 (100%)	271 (100%)	271 (100%)

Language (Question 26). More than three quarters of respondents from each group indicated that they speak their respective ethnic language (Table 4.13). This is generally consistent with the percentage of bilingual persons from each ethnic group at a national level, where more than three quarters from each respective ethnic group are bilingual at home (based on respective figures in Table 2.1; 'Speak a language other than English at home – population 5 years and over', relative to 'Total Population' with population 'under 5 years' removed). Less than 8% in each group indicated that they speak their respective ethnic language only 'somewhat' or 'very little', with a range of 6% to 21% that do not speak their ethnic language at all.

Table 4.13. Ethnic Consumer Respondents by Ethnic Language Fluency

Speak Ethnic Language?	Ethnicity			
	Chinese	Asian Indian	Mexican	Puerto Rican
	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)
Yes	208 (77%)	250 (92%)	210 (77%)	239 (88%)
No	58 (21%)	18 (7%)	40 (15%)	17 (6%)
Somewhat or very little	5 (2%)	3 (1%)	21 (8%)	15 (6%)
Total	271 (100%)	271 (100%	271 (100%)	271 (100%)

4.1.2. Shopping Patterns

Frequency and Spending (Questions 2 and 3). The frequency of purchase for all respondents was 4.2 times per month but this varied by ethnic group. The Chinese group shopped on average 55% more frequently than the three other groups, shopping 5.8 times per month as compared to 3.7, 4.0, and 3.6 for Asian Indians, Mexican, and Puerto Ricans respectively (Table 4.14.) However, although the Chinese made more shopping visits per month for ethnic produce, on average they spent less per visit than the other three groups, such that the average monthly expenditures by Chinese consumers was within 28% of the other groups. Specifically, the average monthly ethnic produce expenditures by group were; $98 for Chinese, $91 for Asian Indian, $79 for Mexican, and $77 for Puerto Ricans, with an overall average across all respondents of $86 (expenditure per month is the product of visits/month and expenditure/visit for each respondent; group averages are calculated accordingly).. The principal shoppers from the Asian sub-groups generally spent, on average, between 15% and 28% more on ethnic produce for their households than the principal shoppers in the Hispanic sub-groups.

Table 4.14. Shopping Frequency and Household Spending by Ethnic Consumer Group

Frequency and Spending	Ethnicity				Total	Minimum N
	Chinese	Asian Indian	Mexican	Puerto Rican		
AVG Number Times per Month	5.8	3.7	4.0	3.6	4.2	246
AVG Expenditure per Visit (reference only)	$21	$28	$21	$23	$23	243
AVG Expenditure per Month On Ethnic Produce ($ per HH)*	$98	$91	$79	$77	$86	224
** AVG Exp/month across all respondents (i.e.Visits/month x $/visit; by respondent);*						
a function of Exp/monh for each respondent that reported both Visits/month and $/visit						
(i.e. NOT the product of AVG Visits/month and AVG $/visit, by ethnic group).						

Point of Purchase (Question 5). Roughly half or more of respondents from each group buy ethnic produce from ethnic grocery stores (Table 4.15) and approximately 85% of Asians (from each sub-group) do so. With the exception of Chinese respondents who did not generally indicate multiple points of purchase, more than half of respondents from each ethnic group also shop at typical American grocery stores for ethnic produce. Approximately 23% of the Hispanic respondents (both Mexican and Puerto Rican) buy

ethnic produce at community farmer markets, as compared to 14% of Asian Indians (and less than 2% of Chinese). Fewer than 20% in each group shop at on-farm markets or roadside stands (18% of Mexicans, 11% of Puerto Ricans, 8% of Asian Indians, and 1% of Chinese).

Table 4.15. Markets where Ethnic Consumers Buy Ethnic Fruits and Vegetables

Places to Buy	Ethnicity			
	Chinese	Asian Indian	Mexican	Puerto Rican
	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)
Typical American grocery store	45 (17%)	154 (57%)	225 (83%)	187 (69%)
Ethnic grocery stores	235 (87%)	228 (84%)	120 (44%)	160 (59%)
Community farmers market	5 (2%)	38 (14%)	62 (23%)	64 (24%)
On-farm markets or roadside stand	4 (1%)	22 (8%)	49 (18%)	31 (11%)
Total*	289 (107%)	442 (163%)	456 (168%)	442 (163%)

** Total number of responses by 271 respondents per ethnic group; percent is relative to 271 respondents*

Proximity to an Ethnic Grocery or Market (Question 7). More than 70% of respondents from each group live within ten miles of an ethnic grocery store or market (Table 4.16). More than 80% from each group live within 20 miles of such an outlet seemingly correlated with the findings that a maximum of roughly this proportion (87% from each group) indicated they shop at ethnic grocery stores. This suggests that relatively few purchasers are willing to travel more than 20 miles to an ethnic store and may be forced to shop at an alternative store. (As a point of reference, Americans travel on average 26 miles to work and the comparable statistic for the four ethnic groups of study ranges from the national average of 26, up to 31 miles; Census 2000; Table 2.1. In general, consumers may not be willing to drive as far as or farther to shop than they would to work.) Based on the responses by non-purchasers (discussed in section 4.2) who cited

lack of ethnic store availability as a reason for non-purchase, some ethnic consumers may not find the ethnic store alternatives satisfy their ethnic shopping needs.

Table 4.16. Distance from Ethnic Consumers' Homes to Nearest Ethnic Market

Distance in Miles	Ethnicity			
	Chinese	Asian Indian	Mexican	Puerto Rican
	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)
0-10	196 (72%)	210 (77%)	200 (74%)	215 (79%)
11-20	34 (13%)	31 (11%)	19 (7%)	16 (6%)
21-30	13 (5%)	6 (2%)	2 (1%)	4 (1%)
31-40	4 (1%)	7 (3%)	2 (1%)	
41-50	4 (1%)	3 (1%)	3 (1%)	2 (1%)
51-60	5 (2%)	4 (1%)	2 (1%)	4 (1%)
61+	15 (6%)	10 (4%)	43 (16%)	30 (11%)
ALL	271 (100%)	271 (100%)	271 (100%)	271 (100%)

4.1.3. Opinions, Preferences, Willingness to Pay, and Related Practices

Attribute Importance (Product; Question 9). Ethnic consumers from all four ethnicities of study showed basic consistencies in terms of rating the relative importance ('very', 'somewhat', or 'not'), of seven specific store and/or product attributes in terms of their decisions to shop for and purchase ethnic produce (Table 4.17). Roughly half or more of respondents from each group rated the seven attributes of study as 'important' (either 'very' or 'somewhat'). Freshness and quality were each deemed 'important' by an overwhelming 98% or more of respondents in each of the groups, followed closely by selection which was deemed 'important' by 93% to 96% in each group. There was more variability across groups in terms of the importance of the four remaining attributes, but product price and store availability were consistently deemed 'important' by more respondents in each group than either language (spoken/on labels/in ads) or product packaging. (Product price and store availability were consistently deemed 'important' by

79% to 93% of respondents in each group, as compared to language and product packaging, deemed 'important' by 49% to 79% in each group).

Table 4.17. Ethnic Consumers' Ratings of Attribute Importance in Decisions to Shop and Purchase Ethnic Produce

Opinion: How Important?	Ethnicity							
	Chinese		Asian Indian		Mexican		Puerto Rican	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Store Availability								
Very	203	75%	202	75%	184	68%	184	68%
Somewhat	32	12%	46	17%	63	23%	57	21%
Not	31	11%	21	8%	21	8%	28	10%
Unsure	5	2%	2	1%	3	1%	2	1%
Language								
Very	120	44%	85	31%	103	38%	114	42%
Somewhat	42	15%	70	26%	52	19%	62	23%
Not	102	38%	116	43%	113	42%	95	35%
Unsure	7	3%			3	1%		
Selection								
Very	229	85%	197	73%	197	73%	194	72%
Somewhat	22	8%	57	21%	63	23%	61	23%
Not	17	6%	17	6%	9	3%	16	6%
Unsure	3	1%			2	1%		
Freshness								
Very	254	94%	251	93%	250	92%	258	95%
Somewhat	12	4%	16	6%	19	7%	8	3%
Not	3	1%	3	1%	1	0%	5	2%
Unsure	2	1%	1	0%	1	0%		
Quality								
Very	249	92%	260	96%	248	92%	254	94%
Somewhat	17	6%	9	3%	20	7%	14	5%
Not	2	1%	1	0%	1	0%	3	1%
Unsure	3	1%	1	0%	2	1%		
Price								
Very	164	61%	134	49%	163	60%	171	63%
Somewhat	51	19%	104	38%	89	33%	74	27%
Not	49	18%	31	11%	19	7%	25	9%
Unsure	7	3%	2	1%			1	0%
Packaging								
Very	53	20%	82	30%	77	28%	124	46%
Somewhat	81	30%	81	30%	110	41%	91	34%
Not	97	36%	99	37%	82	30%	54	20%
Unsure	40	15%	9	3%	2	1%	2	1%
N =	**271**		**271**		**271**		**271**	

Roughly half or more of respondents from each group also rated every attribute, with the exceptions of language and packaging, as '*very* important' factors in their decision-making. The consistent priorities among the groups were freshness and quality (with minimal distinction/preference between the two for each group), both in terms of general importance and extreme importance (i.e. 'very important'). Specifically, freshness and quality were each rated as '*very* important' by 92% to 96% of respondents in each group. Selection was consistently the third most commonly cited 'important' attribute by all groups but was cited as 'very important' by more Chinese than Asian Indians, Mexicans, or Puerto Ricans (rated '*very* important' by 85% of Chinese respondents, as compared to 72% to 73% of respondents in the other three groups). Store availability and price varied slightly in priority across groups (rated '*very* important' by 68%-75% and 49%-63% of respondents from each group, respectively). Language and packaging were rated '*very* important' by 28% to 46% in each group, with the exception the Chinese group's slightly less favorable rating of packaging. 20% of the Chinese group deemed 'packaging' as 'very important', while 15% of the Chinese indicated they were 'unsure' as to the importance of this attribute ('unsure' responses were cited elsewhere but represented 3% or less of responses by each group, for any given attribute).

Ethnic Outlets as Compared to Conventional Establishments (Placement; Question 10). Roughly half or more of respondents in each ethnic group, with the exception of Mexicans, rated ethnic outlets as 'better' than in conventional establishments, in terms of selection and price of produce (Table 4.18). Slightly fewer Mexicans, in contrast, rated ethnic outlets as 'better' based on the same two attributes (38%-39%), seemingly offset by a higher percentage from this group which were 'unsure' as to how the ethnic (versus conventional) outlets compared (in general, for various attributes). Less than a third of respondents in all four ethnic groups considered the selection and price of produce in ethnic and conventional outlets as the 'same', and even fewer (18% or less in each group) considered them 'worse'. Relatively few respondents were 'unsure' (17% of Mexicans, in contrast to 11% or less in the other three groups). These findings, combined with the relative importance of selection and price in consumers' purchase decisions, suggest that

selection and price are determining factors in the decision to shop at ethnic outlets. This finding is even more pronounced in the Chinese respondents' perceptions of selection which was rated 'very important' (by 85%) and perceived (by 72%) to be 'better' in ethnic versus conventional establishments.

Interestingly, freshness and quality were the two most frequently cited 'important' (and moreover 'very important') product attributes by all four ethnic groups, yet a majority of ethnic respondents did not find the produce in ethnic outlets to be better than conventional establishments on the basis of these two criteria. Rather, respondents from each group were roughly split between rating ethnic outlets 'better' or the 'same' with respect to freshness and quality; 30% to 50% from each group fell into each of these categories. Less than 20% in each group considered ethnic outlets 'worse' in this regard and relatively few respondents were 'unsure' as to how ethnic outlets compared based on these two attributes (17% of Mexicans, and 8% or less in the other three groups). These findings, combined with consumers' product attribute importance ratings, suggest that freshness and quality may be secondary to selection (and to a lesser degree, price) in terms of consumers' decisions to shop at ethnic outlets.

Packaging was the only attribute for which ethnic outlets were rated favorable by less than 30% of respondents in all four ethnic groups, indicating it is not a determining factor in most ethnic consumers' decisions to shop ethnic outlets. A majority of respondents from the two Hispanic sub-groups rated ethnic outlets as the 'same' in terms of packaging, while 15% or less of Hispanic respondents rated them 'worse' in this regard. In comparison, between 35% and 40% of respondents from the two Asian sub-groups rated ethnic outlets as the 'same' in terms of packaging, while roughly a quarter rated them 'worse'. 14% to 23% from the Asian sub-groups were 'unsure' how ethnic outlets compared in this regard, revealing a higher level of uncertainty (by Asians) relative to other attributes. The uncertainty by respondents from the respective Hispanic sub-groups was relatively consistent across all attributes (i.e. consistently less than 20% for Mexicans and 7% or less for Puerto Ricans).

Table 4.18. Ethnic Consumers' Comparison of Ethnic Outlets to Conventional Establishments

Opinion	Ethnicity							
	Chinese		Asian Indian		Mexican		Puerto Rican	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Selection Better	196	72%	133	49%	107	39%	147	58%
Same	50	18%	70	26%	90	33%	87	32%
Worse	8	3%	45	17%	28	10%	21	8%
Unsure	17	6%	23	8%	46	17%	16	590%
Freshness Better	134	49%	99	37%	88	32%	110	41%
Same	98	36%	105	39%	100	37%	122	45%
Worse	22	8%	47	17%	39	14%	20	7%
Unsure	17	6%	20	7%	44	16%	19	7%
Quality Better	118	44%	91	34%	84	31%	104	38%
Same	101	37%	111	41%	106	39%	136	50%
Worse	31	11%	53	20%	34	13%	14	5%
Unsure	21	8%	16	6%	47	17%	17	6%
Price Better	160	59%	145	54%	104	38%	138	51%
Same	54	20%	57	21%	73	27%	70	26%
Worse	28	10%	45	17%	48	18%	44	16%
Unsure	29	11%	24	9%	46	17%	19	7%
Packaging Better	43	16%	65	24%	42	16%	68	25%
Same	107	39%	97	36%	138	51%	158	58%
Worse	58	21%	70	26%	39	14%	27	10%
Unsure	63	23%	39	14%	52	19%	18	7%
N =	**271**		**271**		**271**		**271**	

Willingness to Pay (Price; Question 11). A majority of respondents in each ethnic group were willing to pay more for ethnic produce than the comparable American or conventional substitutes (Table 4.19). Roughly a quarter of respondents from each group were willing to pay a maximum of up to 5% more. 15% to 21% from each group were willing to pay a maximum of 6% to 10% more. Less than 15% in each group were willing to pay a maximum of 11% to 20%. 2% to 13% in each group were willing to pay a premium of greater than 25%, with Asian Indians and Chinese at the respective

extremes (this category showed the largest variation across ethnic groups). In general, the diminishing willingness to pay associated with increasingly higher premiums was similar among ethnic groups, until the premiums exceeded 20% at which point 13% of Chinese were willing to pay the premium, as compared to 2% to 8% from the other groups.

Table 4.19. Ethnic Consumers' Willingness to Pay More for Ethnic Produce

Willing to Pay Premium of…	Ethnicity			
	Chinese	Asian Indian	Mexican	Puerto Rican
	Frequency Percent	Frequency Percent	Frequency Percent	Frequency Percent
None	67 (28%)	118 (49%)	93 (38%)	83 (33%)
Up to 5%	70 (29%)	64 (27%)	59 (24%)	66 (26%)
6-10%	51 (21%)	37 (15%)	45 (19%)	48 (19%)
11-15%	9 (4%)	6 (3%)	17 (7%)	18 (7%)
16-20%	9 (4%)	9 (4%)	11 (5%)	20 (8%)
> 20 %	32 (13%)	5 (2%)	17 (7%)	20 (8%)
Total	238 (100%)	239 (100%)	242 (100%)	255 (100%)

Related Practices (Promotion; Questions 13, 14, and 15). Respondents were asked questions with regard to current practices and habits that may impact their ethnic produce purchases in the future. Specifically, respondents were asked what types of advertisements (e.g. out-of-store, visible-from-road, on-site/in-store, and point-of-purchase ads) would influence their decision to purchase ethnic produce, whether or not they grow ethnic produce for consumption, and whether they vegetarians.

With regard to ethnic produce advertisements, in general the Hispanic sub-groups indicated they would be more influenced by such promotions than their Asian counterparts (question 13; Table 4.20). Fewer than 10% of respondents from each of the Hispanic sub-groups indicated that they would not be influenced by any such advertisements, in contrast to 52% of Chinese and 30% of Asian Indians whose responses

suggested that such promotions would not effective. The Hispanic sub-groups were also more likely to be impacted by multiple advertisement types than the Asian sub-groups (the number of responses were more than double the number of influenced respondents from each of the Hispanic sub-groups, as compared to roughly a third as many advertisement types as number of respondents in each of the Asian sub-groups). A majority of all Hispanic respondents (55% to 71%) indicated that out-of-store ads (defined as media including radio, TV, newspaper, and on-line) and/or on-site ads (displays, demos, brochures, posters/banners, or announcements), influence their decision to purchase. Slightly fewer (35% to 48%) indicated that visible-from-road (billboards, on-farm, or roadside stands promotions) and/or point-of-purchase ads (price cards, tags, or produce labels/stickers) are influential. The potential impact of advertisements to the Asian sub-groups is less promising in that no single type influences more than 38% of either group. Moreover, visible-from-road ads (the least influential among all surveyed groups) influence 11% or fewer from each of the Asian sub-groups. Point-of-purchase ads influence slightly more Asian Indian consumers than do out-of-store media (24% and 18%, respectively), but this exception aside, out-of store media and on-site ads are generally the most effective advertisements among all respondents.

Table 4.20. Influence of Advertisement Types on Ethnic Consumers' Decision to Purchase Ethnic Produce

Advertisement Type	Ethnicity			
	Chinese	Asian Indian	Mexican	Puerto Rican
	Frequency Percent	Frequency Percent	Frequency Percent	Frequency Percent
Out-of Store Ads	79 (29%)	50 (18%)	149 (55%)	154 (57%)
Visible-from Road Ads	15 (6%)	29 (11%)	112 (41%)	94 (35%)
On-Site or In-Store Ads	56 (21%)	103 (38%)	192 (71%)	155 (57%)
Point-of -Purchase Ads	16 (6%)	65 (24%)	129 (48%)	122 (45%)
None	141 (52%)	82 (30%)	27 (10%)	25 (9%)
Total*	307 (113%)	329 (121%)	609 (225%)	550 (203%)

** Total number of responses by 271 respondents per ethnic group; percent is relative to 271 respondents*

Roughly a quarter or less of respondents in each group grow their own ethnic produce for consumption, with slightly more Mexicans (32% versus 25% or less in other groups) growing their own (question 14; Table 4.21).

Table 4.21. Ethnic Consumers Growing Fruits and Vegetables for Consumption

Grow Fruits and Vegetables?	Ethnicity			
	Chinese	Asian Indian	Mexican	Puerto Rican
	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)
Yes	55 (20%)	65 (24%)	86 (32%)	68 (25%)
No	216 (80%)	206 (76%)	185 (68%)	203 (75%)
Total	271 (100%)	271 (100%)	271 (100%)	271 (100%)

Half (51%) of the Asian Indian respondents indicated they were vegetarians. In contrast, fewer than 7% of respondents in each of the other three ethnic groups were vegetarians (question 15; Table 4.22). This suggests that produce, in general, is an important staple in the Asian Indian diet and few (non-produce) substitutes may exist for this group relative to ethnic or consumer groups with who are not typically vegetarians. As such, Asian Indian vegetarians are a prime target market for ethnic produce, as vegetables are a mainstay in their diet.

Table 4.22. Ethnic Consumers Self-Identified as Vegetarians

Food Habit; Vegetarian?	Ethnicity			
	Chinese	Asian Indian	Mexican	Puerto Rican
	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)	Frequency (Percent)
Yes	18 (7%)	138 (51%)	18 (7%)	10 (4%)
No	253 (93%)	133 (49%)	253 (93%)	261 (96%)
Total	271 (100%)	271 (100%)	271 (100%)	271 (100%)

4.2. Non-Purchasers: Reasons for Not Purchasing

Reasons (Question 1b). The "non-purchasers" (respondents with a negative answer) were urged to provide reasons they do not generally purchase ethnic produce and were

prompted with plausible causes, if need be, such as “do not like ethnic produce”, “lack of availability”, “poor selection”, “ethnic outlet not available or too far”, or “other”. These respondents then proceeded to complete the abridged form of the survey, in order to explore the potential to capture some portion of this market with increased ethnic produce availability and/or offerings.

A significant majority of all respondents cited gave a sole response when asked for their reasons for not purchasing ethnic produce (Table 4.23; 298 reasons/responses from 282 respondents; response percentages are expressed relative to number of respondents, such that it totals to 106%). A third of the non-purchasers surveyed indicated they do not purchase because they do not like ethnic produce. An additional 10% or so of non-purchasers cited reasons generally related to their personal consumption and/or shopping practices; such as not typically cooking (ethnic or otherwise), age, health, lack of time, or that they grow their own. This portion of the market is not likely to benefit significantly from a local production and marketing of fresh ethnic produce, as a shift in their demand would require drastic changes in personal tastes and/or practices.

Table 4.23. Ethnic Consumers’ Reasons for NOT Purchasing Ethnic Produce

		Total	% of Respondents*
RESPONDENTS		**282**	
RESPONSES - Reasons for non-purchase			
Do not like ethnic produce		92	33%
Lack of availability in American stores		62	22%
Poor Selection in American stores		14	5%
Closest ethnic outlet is too far		10	4%
No ethnic store/outlet available		30	11%
Other:	*no specific reason*	*26*	*9%*
	unfamiliar/don't know how to prepare/just arrived in US	*16*	*6%*
	don't cook ethnic; restaurant/prepared only	*15*	*5%*
	don't cook in general; eat/take out/buy prepared	*12*	*4%*
	age/health reasons (problems/diet/heartburn)	*8*	*3%*
	don't buy/like vegetables (of any kind)	*5*	*2%*

	no time to buy/cook	*4*	1%
	grow their own (home-garden)	*3*	1%
	too expensive	*1*	0%
Total*		*298*	*106%*
** Percentage relative to number of respondents;* *Total is the sum of responses and % respondents, respectively.*			

However, the results indicate that supply-side potential does exist for more than half of this current 'non-purchaser' segment. 27% cited lack of availability and/or poor selection in American stores as reasons for not purchasing. 15% cited proximity, or lack thereof, to an ethnic store or outlet as a reason for non-purchase. Another 15% cited no specific reason or that they were simply either unfamiliar with ethnic produce and how to prepare it. Given these findings, an increase in produce availability and selection, the introduction of additional ethnic outlets, and an improvement in marketing of ethnic produce all present opportunities to reach more than half of the current non-purchasing market. More specifically (in order of time to implement; short to long term), survey findings suggest that simply broadening the distribution (i.e. increasing the local supply) of ethnic produce to existing American stores could extend producers' reach to more than 20% of ethnic consumers not currently purchasing fresh ethnic produce. In addition, improving the selection and/or varieties offered in these mainstream outlets, and accompanying these selections with appropriate and/or enhanced marketing programs (which include educational information that familiarizes consumers with the selections and how to prepare them), has the potential to extend this reach to another 20% of this same non-purchaser market. Introduction of appropriately located new ethnic outlets to supply and promote these and other ethnic produce items may help to extend the reach to over half of all current non-purchasers.

4.3. Purchasers and Non-Purchasers: Willingness to Try/Buy

Willingness (Question 12). Both purchasers and non-purchasers were asked questions about their *relative* willingness (more willing, indifferent, less willing, or unsure) to buy ethnic produce based on certain factors and/or product attributes (six specifically; sold in

ethnic outlets, locally grown, organically grown, genetically modified, country of origin labeling or COOL, and new to market; Table 4.24) .

Table 4.24. Ethnic Consumers' Willingness to Buy Ethnic Produce based on Availability of Certain Characteristics

Opinion	Purchasers								Non-Purchasers	
	Ethnicity									
	Chinese		Asian Indian		Mexican		Puerto Rican		4 Ethnicities Combined	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Sold in Ethnic Outlet	183	67.52%	161	59.40%	210	77.49%	212	78.22%	113	40.07%
More willing										
Indifferent	45	16.60%	71	26.19%	36	13.28%	33	12.17%	65	23.05%
Less willing	21	7.74%	22	8.11%	19	7.01%	15	5.53%	54	19.15%
Unsure	22	8.11%	17	6.27%	6	2.21%	11	4.05%	50	17.73%
Grown on Local Farms	176	64.94%	148	54.61%	216	79.70%	208	76.75%	118	41.84%
More willing										
Indifferent	42	15.49%	84	30.99%	36	13.28%	34	12.54%	66	23.40%
Less willing	24	8.85%	25	9.22%	12	4.42%	24	8.85%	48	17.02%
Unsure	29	10.70%	14	5.16%	7	2.58%	5	1.84%	50	17.73%
Organically Grown	131	48.33%	125	46.12%	152	56.08%	149	54.98%	98	34.75%
More willing										
Indifferent	74	27.30%	75	27.67%	72	26.56%	62	22.87%	74	26.24%
Less willing	33	12.17%	56	20.66%	32	11.80%	48	17.71%	58	20.57%
Unsure	33	12.17%	15	5.53%	15	5.53%	12	4.42%	52	18.44%
Genetically Modified	49	18.08%	26	9.59%	31	11.43%	33	12.17%	26	9.22%
More willing										
Indifferent	63	23.24%	84	30.99%	59	21.77%	48	17.71%	62	21.99%
Less willing	110	40.59%	130	47.97%	152	56.08%	170	62.73%	128	45.39%
Unsure	49	18.08%	31	11.43%	29	10.70%	20	7.38%	66	23.40%
COOL Labeling	141	52.02%	75	27.67%	118	43.54%	136	50.18%	69	24.47%
More willing										
Indifferent	83	30.62%	130	47.97%	117	43.17%	103	38.00%	103	36.52%
Less willing	24	8.85%	42	15.49%	23	8.48%	24	8.85%	53	18.79%
Unsure	23	8.48%	24	8.85%	13	4.79%	8	2.95%	57	20.21%
Recently Introduced/ new	166	61.25%	94	34.68%	157	57.93%	138	50.92%	85	30.14%
More willing										
Indifferent	59	21.77%	93	34.31%	68	25.09%	67	24.72%	73	25.89%
Less willing	21	7.74%	58	21.40%	37	13.65%	52	19.18%	62	21.99%
Unsure	25	9.22%	26	9.59%	9	3.32%	14	5.16%	62	21.99%
N =	**271**		**271**		**271**		**271**		**282**	

Purchasers. A majority of purchasers in each ethnic group were 'more willing' to purchase ethnic produce that is sold in ethnic outlets or grown on local farms (ranging from 55% to 80%, depending on ethnicity, with similar responses to each characteristic within an ethnicity). Approximately half (46%-56%) of the purchasers in each group were 'more willing' to purchase organically grown ethnic produce (with Asians at the lower extremes). The willingness to purchase ethnic produce based on COOL or newness in the marketplace varied by ethnic group. A slim majority of Chinese and Puerto Ricans were 'more willing' to purchase based on each of these characteristics as compared to roughly a third of Asian Indians (offset by a higher percentage of 'indifferent' and 'less willing'). Just under half of Mexicans (44%) were 'more willing' to purchase based on COOL, while slightly more than half (58%) were 'more willing' to purchase ethnic produce that is new to market. The propensity to purchase genetically modified ethnic produce was lower than the propensity to purchase based on every other characteristic; 41% to 63% from each group were 'less willing' to purchase genetically modified as compared to less than a quarter of respondents in each group that were 'less willing' to purchase based on any other characteristic listed. The question of genetic modification also yielded the largest percentage of 'unsure' responses from each ethnic group, relative to every other characteristic listed ('unsure' responses were a maximum of 12% or less of in each group, with the exception of 18% of the Chinese respondents who were 'unsure' about genetic modification).

Non-purchasers. The non-purchaser responses were based on a sample that spanned the four ethnic groups (total of 282 from four ethnicities) and represented their propensity to purchase ethnic produce, relative to purchasers, based upon the availability of the same six characteristics. The relative propensity based on the six attributes was similar among non-purchasers as with purchasers, although the absolute degree (percent) of willingness (i.e. more, indifferent, less, or unsure) differed. Specifically, a larger percentage of non-purchasers (albeit not quite a majority) were 'more willing' to purchase ethnic produce that was sold in ethnic outlets (40%) or grown on local farms (42%) than any other characteristic. These characteristics were followed by 'organically grown', in terms of non-purchaser willingness (i.e. 35% 'more willing'). In terms of COOL and newness to

market, the willingness within each category was not as distinct. 30% of non-purchasers were 'more willing' to purchase newly introduced ethnic produce, yet the percentage of non-purchasers that were indifferent, less willing, or unsure were not far behind (26%, 22%, and 22%, respectively). 24% of non-purchasers were 'more willing' to purchase ethnic produce with country of origin labeling, but a higher percentage (37%) were indifferent in this regard (as was the case with the Asian Indian purchaser group). In general, the primary difference between purchasers and non-purchaser willingness was that fewer non-purchasers were 'more willing' to purchase based on each characteristic, offset by more non-purchasers in the 'less willing' and 'unsure' categories. Moreover, the 'less willing' and 'unsure' categories for non-purchasers were roughly the same for all characteristics (as opposed to a higher 'less willing') and ranged from 17% to 23%. This reveals slightly more uncertainty by non-purchasers than purchasers suggesting that non-purchasers may be more receptive to such characteristics (attributes) with additional availability and promotion. Although their propensity to purchase based upon the availability of specific characteristics may not be as strong as that of current purchasers, substantial opportunities do exist to capture upwards of 40% of the current ethnic non-purchasers through either increasing availability in ethnic outlets or selling locally grown ethnic produce. Additional opportunities associated with the remaining characteristics do exist for non-purchasers, as with purchasers, but to a lesser degree (i.e. similar order of potential impact; COOL and new to market preferred to genetically modified).

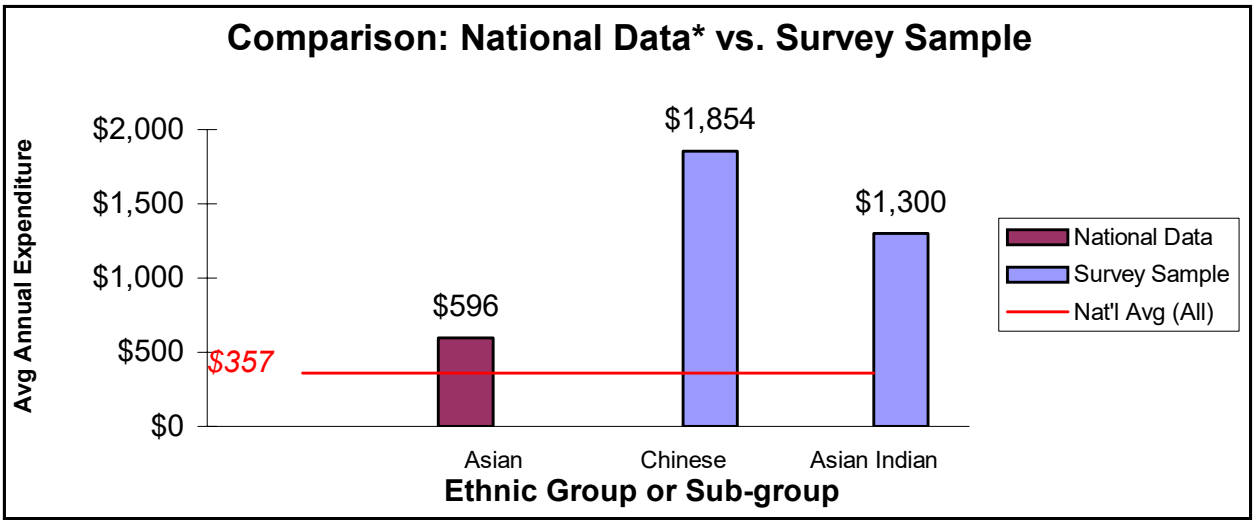
4.4. Produce Expenditures

The survey collected three types of ethnic consumer expenditures; total produce expenditure, ethnic produce expenditure, and expenditures for specific ethnic produce items (which varied by ethnic group). All three expenditure types were based on estimates by each respondent's (i.e. principal household grocery shopper's) estimate of average purchases during a specified period of time, over the course of the past twelve months. The period of time specified for total and ethnic produce expenditures was a month and these related questions were grouped together, in the beginning of the survey. The period of time specified for purchase data details for specific ethnic produce items (which included quantity purchase and typical price paid) was one week. The period of

time for these detailed estimates was abbreviated from the overall spending estimates, given the details the respondent's were asked to recollect and average over the time period, especially given the greater shopping frequency experienced by Asians and Hispanics, as compared to the general U.S. population (PMA, 2006; sources cited: 'The Fresh Imperative: Creating excellence in Asian food retailing," Coca Cola, 2005 and 'Numero Uno Atencion!," Produce Business, May 2003). These produce-related questions were in a separate, subsequent section the survey, removed from the questions of monthly spending estimates, to avoid respondent confusion over the distinct periods of time.

Data Validity Check: Average Expenditures by Ethnic Group. Comparisons between average produce expenditures for each ethnic group and national averages for fresh produce expenditures for the corresponding race or origin were conducted. Specifically, surveyed ethnic sub-group data was compare to national data by race and ethnic origin, as national ethnic sub-group data does not exist (i.e. surveyed Chinese and Asian Indian data compared to national benchmarks for Asians; surveyed Mexican and Puerto Rican data compared to national benchmarks for consumers of Hispanic/Latino origin). Moreover, national data does not exist for specific demographic characteristics within a given ethnicity (i.e. cross-tabulated data by ethnic group). In general, the average annual fresh fruit and vegetable expenditures by the Asian and Hispanic groups, both national and survey sample data, were higher than the overall national average (i.e. $357 for the entire population, irrespective of ethnicity; BLS, 2005). Not accounting for demographic characteristics other than ethnicity (e.g. region, income and other attributes), the comparisons of sample data to national benchmarks revealed that the average expenditures by ethnic consumers surveyed were as much as two to three and a half times the respective national averages, depending on the ethnicity (Figures 4.1.a. and 4.1.b.). Absent a suitable national benchmark for ethnic consumers by demographic characteristic, an in-depth analysis of the available data suggests that the average expenditures for ethnic consumers this study's sample should exceed the respective national ethnic benchmarks, but the findings contained in this study are unprecedented.

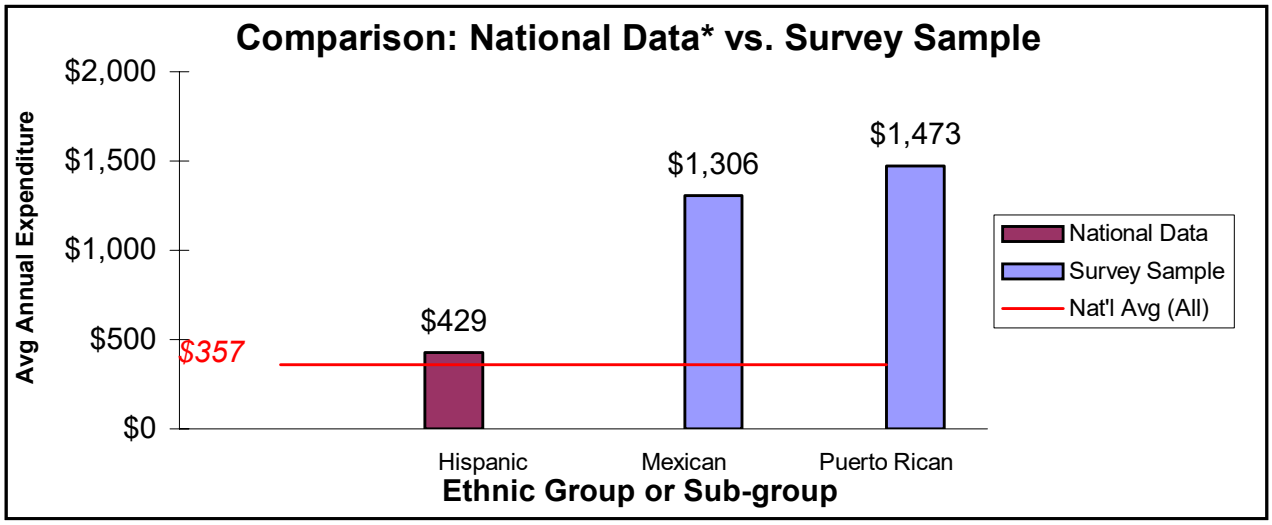
Figure 4.1.a. Fresh Produce Expenditures: Asian Consumers



* Source: Consumer Expenditure Survey, 2005; Bureau of Labor Statistics, US Dept of Commerce

Note: Survey results for Chinese and Asian Indians are compared to a national average for all Asians, as the relevant country of origin data does not exist at a national level.

Figure 4.1.b. Fresh Produce Expenditures: Hispanic/Latino Consumers



* Source: Consumer Expenditure Survey, 2005; Bureau of Labor Statistics, US Dept of Commerce

Note: Survey results for Mexicans and Puerto Ricans are compared to a national average for all Hispanics, as the relevant country of origin data does not exist at a national level.

Detailed Benchmark Comparisons and Analysis: A Unique Target Market. The substantial disparity between the survey sample and national data can be partially attributed to the inconsistent definitions of ethnicity as a result of lack of data availability (by ethnic sub-group) at a national level. Prior research suggests that the average fresh produce expenditure by all Asians is lower than that of the Chinese and Asian Indian sub-groups (related ethnic studies of the three primary Asian sub-groups showed that the average fresh produce expenditures by each of the Chinese and Asian Indians sub-groups exceeded the corresponding Korean average; Govindasamy et al., 2006). It is plausible that the same logic applies to Hispanics, relative to the Mexican and Puerto Rican sub-groups, such that a similar disparity in expenditures would be justified.

Another reason for relatively high survey expenditures is that the national expenditure averages may include consumers with no expenditures, whereas the survey data only includes responses of non-zero expenditures. Also, the survey data only includes responses from ethnic consumers that purchase ethnic produce and prior studies have shown that these consumers tend to have higher fresh produce expenditures in general (ethnic and American combined) than their ethnic consumer counterparts who do not purchase fresh ethnic produce (Govindasamy et al., 2006).

A more detailed analysis suggests that expenditure differences are also attributable the different demographic profiles for each target (niche) ethnic market, relative to the profiles of the larger ethnic populations. The analysis showed that, on the basis of average national expenditures by region, education level, and/or household size, the demographic profiles of surveyed consumers for this study would result in even higher expenditures than the respective Asian and Hispanic national averages ($526 and $429, respectively; BLS, 2005). The exact magnitude of this expectation is not quantifiable, as the relevant cross-tabulations of demographics by ethnicity are not available as a national benchmark. Consequently, comparisons of national and survey data should be interpreted as relative (directional) information, as opposed to absolute data (deltas). The following demographic differences between the composition of the survey sample and

the national data (irrespective of race and/or origin) help illustrate this point and validate the relatively high expenditures reported in this study (Figure 4.2.);

Region

The national data is divided into four regions; Northeast, South, Midwest, and West. Average fresh fruit and vegetable expenditures by consumers in the Northeast region exceed those of consumers nationwide and in each of the other three regions ($431 annually, or 21% more, relative to $357 national benchmark; BLS, 2005), but less than a third of all consumers reside in the Northeast. In comparison, a majority of survey respondents from each ethnicity (i.e. Asian and Hispanic) reside in the Northeast Region where expenditures are generally higher. Specifically, 64% of all those surveyed reside in the Northeast region (with up to 80% of some ethnic sub-groups living in this area).

Education

Nationally, consumers having Associate's Degrees or higher average higher fresh produce expenditures than the overall population (up to $562 annually, or 57% more, relative to $357 national benchmark, BLS, 2005). 37% of consumers across the nation have Associates Degrees or higher, as compared to 60% of consumers in the survey sample for this niche market study.

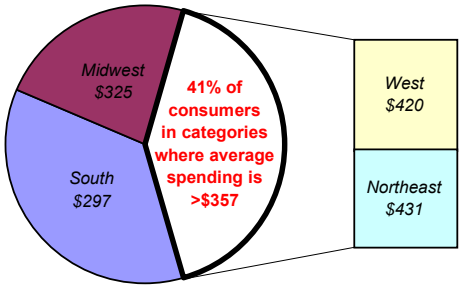
Household Size (or "consumer unit")

A majority of consumers across the nation have one or two people in their household. 39% of consumers have households that consist of more than two people and average higher expenditures than the national average (up to $551 annually, or 54% more, relative to $357 national benchmark; BLS, 2005). In contrast, three quarters of consumers in the survey sample have three or more people in their household.

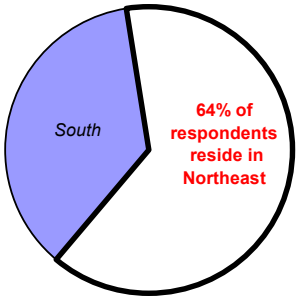
Figure 4.2. Ethnic Consumer Characteristic Comparison: National Data vs. Survey Sample

Percent Population in Categories where Average Annual Expenditures Exceed National Average* Compared to Corresponding Percent of Survey Sample Respondents in Similar Categories

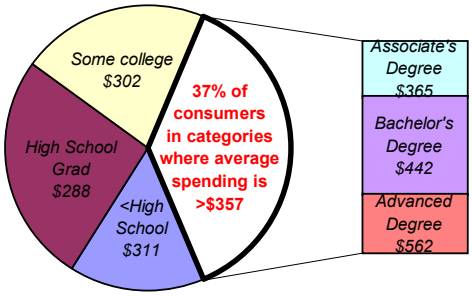
National Data: Average Annual Consumer Expenditures by Region



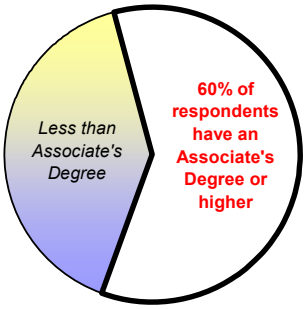
Survey Sample: Respondents by Region (Chinese, Asian Indian, Mexican, & Puerto Rican)



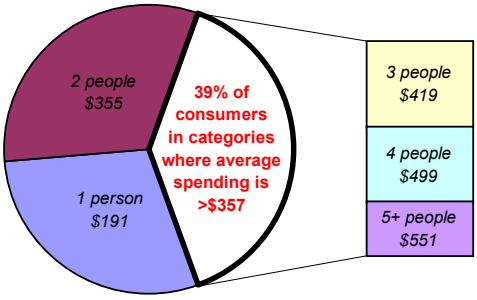
National Data: Average Annual Consumer Expenditures by Education Level



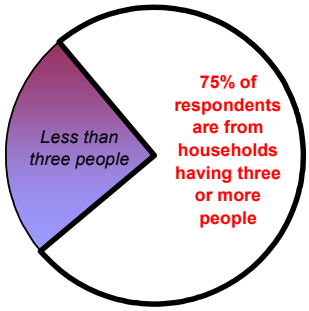
Survey Sample: Respondents by Education Level (Chinese, Asian Indian, Mexican, & Puerto Rican)



National Data: Average Annual Consumer Expenditures by Size of Consumer Unit



Survey Sample: Respondents by Household Size (Chinese, Asian Indian, Mexican, & Puerto Rican)



** National Average Annual Consumer Expenditures for Fresh Fruits and Vegetables = $357 **

Source: Consumer Expenditure Survey, 2005; Bureau of Labor Statistics, United States Department of Commerce

4.4.1. Specific Ethnic Crops

The primary purpose of the average weekly expenditure data for 42 specific ethnic crops (survey question #8) was to prioritize subsequent production research. Detailed data including quantity, price, and expenditure for each produce item was collected. Once summarized, this data yielded average expenditures for each crop, by ethnic group, and served as a common denominator to compare and prioritize crops within each group.

Additional organization and analysis of the quantity and price data was conducted to assess relevant retail sales data for each produce item (i.e. typical quantities, unit types, and retail prices) based specifically on data provided by only the ethnic respondents that purchase each particular item (i.e. excluding zero purchases by ethnic respondents). The analysis itself entailed grouping respondent data by unit of measure (pounds, bunches, and numbers), calculating average quantity and price by unit type for each item by ethnic group, and determining the commonly purchased unit (Tables 4.25.a. through 4.25.d., by ethnic group). The resulting outputs provide the appropriate market price and volume specifics, based on a subset of respondents, to facilitate future marketing decisions and strategies when combined with the final production crop research recommendations. As an example, Baby Pak Choy yields the highest expenditures relative to other respectively purchased Chinese produce items (i.e. average expenditure by item across Chinese respondents, exclusive of zero-purchases). Baby Pak Choy was purchased by a significant majority of Chinese respondents (188 of 271), primarily by the pound (96% of all unit types), and had a relatively high average retail price per pound ($1.52) and average quantity purchased (1.96 pounds). By combining this data with production cost and yield data (estimated quantity), a grower could project the approximate (direct) retail sales dollars and pounds, number of customers, and potential profits associated with harvesting this crop (assumes grower sells direct to market). Similarly, in cases where an extended distribution chain is involved a wholesaler and/or retailer could, in turn, determine their potential (respective) profits based upon the quantity available and their (respective) costs and/or markups along the distribution channel. Such information is essential to successful planning, pricing, and marketing and should be used in conjunction with subsequent crop production recommendations accordingly.

Table 4.25.a. Average Quantity Purchased and Price Paid for Specific Ethnic Produce Items: Chinese Respondents

Produce Item	Average Respondent Purchases per Household									
	Quantity Purchased**			Price Paid			Expenditure	N*	Most Frequently Purchased	
	Pounds	*Bunches*	*# items*	*$/pound*	*$/bunch*	*$/item*	*All Units*	*(exp)*		
Basil	1.00	**1.20**	1.50	$1.53	$1.02	$0.50	$1.22	*48*	*77%*	*Bunches*
Baby Pak Choy	**1.96**	1.38	1.60	$1.52	$1.72	$2.10	$2.91	*188*	*96%*	*Pounds*
Edamame	1.16	**1.35**	1.61	$1.47	$1.28	$1.11	$1.74	*112*	*39%*	*Bunches*
Luffa	**1.52**	1.00	1.45	$1.42	$1.00	$3.12	$2.35	*111*	*76%*	*Pounds*
Malabar Spinach	**1.00**	1.00	*n/a*	$1.95	$1.58	*n/a*	$1.78	*30*	*56%*	*Pounds*
Napa Cabbage	**2.17**	1.54	1.19	$0.63	$2.06	$1.27	$1.43	*177*	*82%*	*Pounds*
Oriental Eggplant	**1.72**	1.00	2.70	$1.31	$1.65	$1.14	$2.51	*155*	*86%*	*Pounds*
Oriental Spinach	1.56	**1.51**	1.78	$1.42	$1.08	$1.12	$1.77	*173*	*62%*	*Bunches*
Oriental Mustard	**1.58**	1.22	1.00	$1.03	$1.01	$1.63	$1.70	*104*	*92%*	*Pounds*
Pak Choy	**2.10**	1.20	1.50	$1.09	$1.82	$1.40	$2.05	*207*	*93%*	*Pounds*
Perilla	1.00	1.00	**1.00**	$1.43	$1.43	$1.42	$1.39	*37*	*49%*	*# items*
Snow Peas	**1.43**	1.00	1.50	$1.59	$2.00	$2.50	$2.19	*139*	*99%*	*Pounds*

** N represents number of responses included in the Average Expenditure across all units.*

The number of responses varies by Quantity and Price, depending on the unit type (lb/bunch/#).

*** Figures in bold for "Quanitity Purchased" indicate most frequently purchased unit type.*

Table 4.25.b. Average Quantity Purchased and Price Paid for Specific Ethnic Produce Items: Asian Indian Respondents

Produce Item	Average Respondent Purchases per Household									
	Quantity Purchased**			Price Paid			Expenditure	N*	Most Frequently	
	Pounds	*Bunches*	*# items*	*$/pound*	*$/bunch*	*$/item*	*All Units*	*(exp)*	*Purchased*	
Amaranth	**1.97**	1.56	1.00	$1.97	$1.80	$0.99	$3.54	*46*	*65%*	*Pounds*
Bottle Gourd	**1.60**	1.33	1.64	$1.60	$1.63	$1.53	$2.72	*114*	*69%*	*Pounds*
Bitter Gourd	**1.77**	1.25	4.55	$2.01	$0.99	$1.75	$4.07	*138*	*94%*	*Pounds*
Cluster Beans	**1.63**	1.75	1.33	$2.14	$2.00	$1.75	$3.64	*87*	*93%*	*Pounds*
Eggplant	**1.56**	1.29	2.20	$1.49	$1.83	$1.53	$2.87	*174*	*62%*	*Pounds*
Fenugreek Leaves	1.74	**1.56**	1.63	$1.91	$1.48	$1.36	$2.53	*141*	*65%*	*Bunches*
Mint Leaves	1.43	**1.19**	1.24	$1.10	$1.14	$1.12	$1.45	*116*	*79%*	*Bunches*
Mustard Leaves	2.47	**2.13**	1.33	$1.73	$1.79	$1.76	$4.34	*62*	*52%*	*Bunches*
Ridged Gourd	**1.86**	2.00	1.92	$1.68	$2.50	$1.78	$3.11	*76*	*87%*	*Pounds*
White Pumpkin	**1.58**	1.75	1.30	$1.45	$1.33	$1.85	$2.22	*62*	*77%*	*Pounds*

** N represents number of responses included in the Average Expenditure across all units.*

The number of responses varies by Quantity and Price, depending on the unit type (lb/bunch/#).

*** Figures in bold for "Quanitity Purchased" indicate most frequently purchased unit type.*

Table 4.25.c. Average Quantity Purchased and Price Paid for Specific Ethnic Produce Items: Mexican Respondents

Produce Item	Average Respondent Purchases per Household									
	Quantity Purchased**			Price Paid			Expenditure	N*	Most Frequently	
	Pounds	*Bunches*	*# items*	*$/pound*	*$/bunch*	*$/item*	*All Units*	*(exp)*	*Purchased*	
Anaheim Pepper	**1.67**	1.43	2.15	$1.90	$2.09	$1.54	$3.42	*61*	*75%*	*Pounds*
Calabacita	**2.26**	1.55	2.59	$1.69	$2.26	$1.29	$3.90	*79*	*73%*	*Pounds*
Chili Jalapeno	**1.99**	2.15	4.56	$1.87	$2.08	$1.50	$4.06	*161*	*72%*	*Pounds*
Chili Habanaro	**1.57**	1.43	2.18	$1.61	$2.03	$0.75	$2.38	*26*	*62%*	*Pounds*
Chili Poblano	**1.98**	1.20	3.24	$2.40	$1.96	$1.93	$4.45	*72*	*69%*	*Pounds*
Chili Serrano	**1.46**	1.11	5.14	$1.90	$1.68	$1.33	$3.36	*69*	*75%*	*Pounds*
Calabaza	**2.24**	1.86	2.04	$1.80	$2.17	$1.51	$4.08	*85*	*71%*	*Pounds*
Cilantro	1.89	**1.51**	1.33	$1.45	$1.05	$0.95	$1.68	*176*	*89%*	*Bunches*
Tomatillo	**2.25**	2.17	4.33	$1.94	$1.40	$1.02	$3.97	*104*	*88%*	*Pounds*
Tutuma	**1.67**	1.00	1.00	$1.93	$2.00	$1.74	$2.85	*9*	*67%*	*Pounds*

** N represents number of responses included in the Average Expenditure across all units.*

The number of responses varies by Quantity and Price, depending on the unit type (lb/bunch/#).

*** Figures in bold for "Quanitity Purchased" indicate most frequently purchased unit type.*

Table 4.25.d. Average Quantity Purchased and Price Paid for Specific Ethnic Produce Items: Puerto Rican Respondents

Produce Item	Average Respondent Purchases per Household									
	Quantity Purchased**			Price Paid			Expenditure	N*	Most Frequently	
	Pounds	*Bunches*	*# items*	*$/pound*	*$/bunch*	*$/item*	*All Units*	*(exp)*	*Purchased*	
Aji Dulce	**2.77**	1.43	3.19	$2.08	$2.10	$1.14	$4.54	*90*	*54%*	*Pounds*
Batata	**1.97**	2.64	2.16	$1.57	$2.20	$1.35	$3.48	*120*	*78%*	*Pounds*
Berenjena	**1.26**	2.00	2.05	$1.67	$2.76	$1.30	$2.68	*49*	*65%*	*Pounds*
Calabacita	**2.07**	2.67	1.33	$1.36	$2.30	$1.07	$3.12	*36*	*58%*	*Pounds*
Calabaza	**1.65**	1.00	1.37	$1.54	$2.64	$2.08	$2.43	*98*	*78%*	*Pounds*
Chili Caribe	**1.96**	1.83	1.76	$2.06	$2.22	$1.30	$3.64	*41*	*54%*	*Pounds*
Cilantro	1.26	**1.72**	1.60	$1.57	$1.43	$0.50	$2.57	*165*	*82%*	*Bunches*
Fava Beans	**1.80**	2.57	3.20	$1.45	$0.97	$0.82	$3.02	*54*	*51%*	*Pounds*
Pepinillo	1.52	2.07	**2.04**	$1.35	$2.02	$0.89	$2.14	*83*	*57%*	*# items*
Verdolaga	1.00	**1.86**	*n/a*	$1.39	$1.92	*n/a*	$4.68	*6*	*83%*	*Bunches*

** N represents number of responses included in the Average Expenditure across all units.*

The number of responses varies by Quantity and Price, depending on the unit type (lb/bunch/#).

*** Figures in bold for "Quanitity Purchased" indicate most frequently purchased unit type.*

4.4.2. Ethnic Produce

The ethnic produce expenditures per person for each household (survey questions #2, #3, and #18) were utilized to arrive at the corresponding averages by ethnic group. Specifically, the per person expenditures for each respondent household were calculated as the product of purchase frequency (number of typical visits per month; survey question #2) and average spending per visit per household member (average spending per visit; survey question #3, divided by the number of household members; survey question #18). These expenditures were summarized by ethnic group with monthly expenditure per person averages as follows; $32 for Chinese, $27 for Asian Indian, $22 for Mexican, and $23 for Puerto Ricans (Table 4.26). In general, the Asian sub-groups spent 19% to 47% more per person on ethnic produce, on average, than the Hispanic sub-groups (revealing even more disparity between groups on a *per person* basis than the corresponding 15% to 28% more *per household* previously cited in section 4.1.2). These same averages were subsequently compared to the respective average total produce expenditures for each ethnic group and were ultimately used to estimate the respective ethnic market estimates for each respective local population (Section 5).

Table 4.26. Ethnic and Total Produce Expenditures by Ethnic Consumer Group

Frequency and Spending	Ethnicity					
	Chinese	Asian Indian	Mexican	Puerto Rican	Total	Minimum N
AVG Expenditure per Month On Ethnic Produce ($ per person)*	$32	$27	$22	$23	$26	213
AVG Expenditure per Month on All Produce ($ per person)	$48	$33	$31	$37	$37	237
Ethnic as % of Total Produce Expenditure (per person)	67%	82%	71%	62%	69%	

** AVG Exp/month across all respondents (i.e.Visits/month x $/visit, divided by household size, by respondent); a function of Exp/monh for each respondent that reported Visits/month, $/visit, and HH size (i.e. NOT the product of AVG Visits/month pp and AVG $/visit pp, by ethnic group).*

4.4.3. Total Produce

The average monthly per person expenditures for all produce items (survey question #4), ethnic and American, ranged from $31 for Mexicans to $48 for Chinese (with $33 for Asian Indians and $37 for Puerto Ricans), with an average of $37 for respondents from all four groups (Table 4.26). A comparison of ethnic to total produce expenditures per person (i.e. ethnic produce, as a percentage of all produce expenditures) for each ethnic group reveals that ethnic produce comprises more than 60% of total produce expenditures for each ethnic group. Ethnic produce is even more predominating in Asian Indian produce spending, comprising an average of 82% of total produce expenditures by this group. This suggests that Asian Indians dedicate a relatively higher portion of their produce spending to ethnic items and as such, may be less likely to purchase to American substitutes than their Mexican, Chinese, and Puerto Rican counterparts accordingly. This, combined with the finding that 51% of Asian Indians surveyed were vegetarians, reinforces the long term economic advantages of addressing the ethnic produce demand by this prime target market in particular (i.e. dedicated consumer base).

5. MARKET ESTIMATION BY ETHNIC GROUP

Per Person Expenditure Estimates. The average monthly ethnic produce expenditures per person for each ethnic group sampled were the basis for the ethnic produce market size estimates for the corresponding East Coast ethnic populations (the expenditures are

the result of the total monthly produce expenditures described in section 4.4, divided by the number of people per household for each respondent). The estimation process began with annualizing the monthly per person figures by ethnic group (i.e. monthly x 12), to arrive at expenditures per person, for each ethnic group sample.

$$EXP_{\text{Sample Mean}} = [(\sum_{N=1}^{271} \text{Monthly Expenditure}_N/\text{Household size}_N) \div 271] \times 12$$

where EXP = annual ethnic produce expenditure per person, by ethnic group

N = number of respondents from each (of four) ethnic group(s) of study

These sample means were then utilized to estimate monthly ethnic produce expenditures per person for the respective East Coast ethnic populations. These estimates were developed in an interval fashion to arrive at a 90% Confidence Interval for the population mean, such that upper and lower bounds were estimated within 1.645 standard errors of the sample mean (i.e. average expenditure).

$$EXP_{\text{Pop Mean (Lower Bound)}} = EXP_{\text{Sample Mean}} - 1.645 \text{ Std Error}_{\text{Sample}}$$

and

$$EXP_{\text{Pop Mean (Upper Bound)}} = EXP_{\text{Sample Mean}} + 1.645 \text{ Std Error}_{\text{Sample}}$$

where $EXP_{Pop\ Mean}$ = *a range (lower/upper bound) estimate, by ethnic group*

$\text{Std Error}_{Sample}$ = *(Standard Deviation*$_{Sample}$*)/SquareRoot(N), by group*

Expenditure Extrapolation. Census population data for each ethnic group served as the basis for estimating the approximate East Coast ethnic consumer base for each group (Census 2000; 'Total' East Coast population per ethnic group in Table 3.1).

$$POP_{\text{East Coast}} = \sum_{State=1}^{17} POP$$

where POP = U.S. Census 2000 population for the respective ethnic group

State = 16 states + D.C. as defined by study as 'East Coast'

Survey findings were utilized to estimate the portion of the ethnic population(s) that typically *purchase* ethnic produce. The number of completed surveys were utilized to

determine the percentage of ethnic consumers sampled that did *NOT purchase* ethnic produce, to serve as a proxy for non-purchasers in the larger population. Specifically, non-purchaser (short) surveys accounted for 282 out of the total 1,366 ethnic consumer surveys completed, or 21%. A post-mortem analysis of survey implementation findings supported the use of these completed survey counts as a proxy for non-purchasers in the larger population, despite the fact that the counts were originally a function of sample size requirements (i.e. limited to the sample size requirements, as statistically determined to ensure representation of both purchaser and non-purchaser demand perspectives). Moreover, although interviews continued until both purchaser and non-purchaser survey requirements were met, survey administration results indicated that the respective sample size objectives for each (271 per ethnic group and 271 *across* all groups, respectively) were achieved almost simultaneously.

An ad-hoc analysis revealed that purchaser sample size requirements (for each ethnic group) were achieved first, while concurrent calls to all ethnic groups continued until which time the non-purchaser sample requirement was achieved. At the time the purchaser requirements were met, the number of completed surveys by non-purchasers was within 10% or so of the minimum requirement (the precise number is not known because of the simultaneous interview process). Ultimately, the final number of short surveys (282) exceeded of the minimum sample size requirement (271) by the time calling ceased. Absent a precise number, these ad-hoc results suggest that 21% is a conservative estimate of non-purchasers (relative to 20% based on sample size objectives, or something less) for the purpose of extrapolating expenditures to the estimated purchasing populations only.

The East Coast ethnic consumer base for each ethnic group was reduced by 21% to arrive at an adjusted ethnic consumer base, exclusive of non-purchasers of ethnic produce. The estimated lower and upper bounds for average annual produce expenditure per person for each ethnic group were multiplied by the respective, reduced East Coast Census population counts to arrive at lower and upper bound market expenditure estimates, by ethnic group (i.e. 90% Confidence Interval for respective population means).

$$MKT_{(Lower\ Bound)} = EXP_{Pop\ Mean\ (Lower\ Bound)} \times [POP_{East\ Coast} \times (1 - 0.21)]$$

and

$$MKT_{(Upper\ Bound)} = EXP_{Pop\ Mean\ (Upper\ Bound)} \times [POP_{East\ Coast} \times (1 - 0.21)]$$

where MKT = East Coast market size (annual expenditures; $), by ethnic group and [POP x (1 - 0.21)] is a proxy for the population of ethnic produce purchasers, by ethnic group

The resulting produce market estimates are as follows; $245M to $296M for Chinese, $190M to $230M for Asian Indian, $281M to $362M for Mexican, and $531M to $655M for Puerto Ricans (Table 5.1.). The associated margin of error for each ethnic group ranges from 5.37% to 5.64%.

Table 5.1. Ethnic Produce Market Estimates

Survey Sample Data	**Chinese**	**Indian**	**Mexican**	**Puerto Rican**
# Respondents (survey N)	213	234	233	232
Avg Ethnic Produce Expenditure/Month per person	$32	$27	$22	$23
Avg Ethnic Produce Expenditure/Year per person	$385	$326	$261	$275
Standard Deviation (Produce Exp/Yr pp)	$319	$287	$307	$266
Standard Error (Produce Exp/Yr pp)	$22	$19	$20	$17
Expenditure Estimate for Ethnic Population Mean (Sample Mean ± 1.645 Std. Error)				
Avg Produce Exp/Yr pp estimate; Lower Bound (90% CI)	$349	$295	$228	$246
Upper Bound (90% CI)	$421	$357	$295	$304
Margin of error (90% CI)	5.64%	5.37%	5.38%	5.40%
Produce Market Estimates				
East Coast Population (Census 2000)	884,748	812,576	1,549,761	2,718,495
Estimated East Coast Pop. Purchasing Ethnic Produce (~79%, based on survey findings)	702,099	644,826	1,229,825	2,157,283
East Coast Produce Market Est.; Lower Bound (90% CI)	$245,255,771	$190,308,137	$280,759,513	$531,158,415
Upper Bound (90% CI)	$295,679,025	$230,079,604	$362,196,607	$655,128,850
Margin of error (90% CI)	5.64%	5.37%	5.38%	5.40%

6. MARKET-DRIVEN PRODUCTION RESEARCH

The results of the produce expenditure data from 1,084 surveys completed by ethnic produce purchasers, combined with the expertise of local crop specialists with consideration for production and logistical concerns, provided the tools necessary to prioritize crops for subsequent production research. A combined assessment (actual survey demand and estimated production potential) was particularly important in cases where a single systematic demand approach was not sufficient to distinguish between crops for research prioritization purposes.

6.1. Crop Demand and Supply Considerations

Demand; Rank Crops by Ethnicity. Results of the survey of 271 randomly selected East Coast consumers from each of the four ethnic groups were used to rank the crops included in the questionnaire, within ethnicity, according to expenditure and/or purchase data. Multiple criteria were established to rank produce items according to: (1) mean (weekly) expenditures across all respondents (including zero purchases); (2) mean (weekly) expenditures across only respondents purchasing that item (excluding zero purchases); (3) frequency of purchase across respondents (binary; 1 or 0 for purchase or non-purchase, respectively), (4) volume (number of pounds, bunches, or units) purchased by each respondent for each produce item; and (5) overall rank (average of results rankings #1 thru #4) for each produce item.

The rank order according to survey respondents' purchases varied somewhat across the multiple criteria (Tables 6.1.a. through 6.1.d., by ethnic group). However, a few produce items from each ethnicity consistently ranked 8 or higher in a majority of the (5) criteria. This allowed for a systematic approach to eliminate crops from the research candidacy list. An Overall Rank threshold of 8 (average rank higher than 7) was established to help identify crops with relatively low survey demand in an initial attempt to arrive at 28 crops for the final production study. Crops at or above this threshold were more closely examined based on the other (four) criteria. Crops ranked 8 or higher in *all* (5) categories

were automatically removed from further production considerations (i.e. seven crops eliminated due to low survey demand).

Table 6.1.a. Ethnic Produce Survey Ranking:

Chinese Respondents

Produce	Rank Based on Criteria						Expenditure
	Avg Exp* (Includes all respondents)	Avg Exp** (Purchasers only)	Produce Purchase Frequency	Volume of Produce Bought	Average Rank	Overall Rank	Avg Exp* (Includes all respondents)
Baby Pak Choy	1	1	2	2	1.5	1	$2.26
Pak Choy	2	5	1	1	2.25	2	$1.77
Oriental Eggplant	3	2	5	4	3.5	3	$1.60
Snow Peas	4	4	6	6	5	4	$1.29
Oriental Spinach	5	7	4	5	5.25	5	$1.28
Napa Cabbage	7	10	3	3	5.75	6	$1.04
Luffa	6	3	8	7	6	7	$1.10
Edamame	8	8	7	9	8	8	$0.79
Oriental Mustard	9	9	9	8	8.75	9	$0.71
Malabar Spinach	11	6	12	12	10.25	10	$0.20
Basil	10	12	10	10	10.5	11	$0.22
Perilla	12	11	11	11	11.25	12	$0.19

** Avg Exp (Expenditures); includes all consumer responses (whether or not the respondent purchased a particular item, or reported "0").*

*** Avg Exp (Expenditures); includes only consumers who purchased the item (excludes purchases equal to "0").*

Table 6.1.b. Ethnic Produce Survey Ranking:

Asian Indian Respondents

Produce	Rank Based on Criteria						Expenditure
	Avg Exp* (Includes all respondents)	Avg Exp** (Purchasers only)	Produce Purchase Frequency	Volume of Produce Bought	Average Rank	Overall Rank	Avg Exp* (Includes all respondents)
Bitter Gourd	1	2	3	2	2	1	$2.48
Eggplant	2	6	1	1	2.5	2	$2.23
Fenugreek Leaves	3	8	2	3	4	3	$1.48
Cluster Beans	4	3	6	5	4.5	4	$1.33
Bottle Gourd	5	7	5	4	5.25	5	$1.31
Mustard Leaves	6	1	8	7	5.5	6	$1.06
Ridge Gourd	7	5	7	6	6.25	7	$0.94
Mint Leaves	8	10	4	8	7.5	8	$0.68
Amaranth	9	4	10	10	8.25	9	$0.61
White Pumpkin	10	9	9	9	9.25	10	$0.56

** Avg Exp (Expenditures); includes all consumer responses (whether or not the respondent purchased a particular item, or reported "0").*

*** Avg Exp (Expenditures); includes only consumers who purchased the item (excludes purchases equal to 0).*

Table 6.1.c. Ethnic Produce Survey Ranking:

Mexican Respondents

Produce	Rank Based on Criteria						Expenditure
	Avg Exp* (Includes all respondents)	Avg Exp** (Purchasers only)	Produce Purchase Frequency	Volume of Produce Bought	Average Rank	Overall Rank	Avg Exp* (Includes all respondents)
Chili Jalapeno	1	3	2	1	1.75	1	$2.76
Tamatillo	2	4	3	2	2.75	2	$1.73
Calabaza	3	2	4	4	3.25	3	$1.49
Chili Poblano	5	1	6	6	4.5	4	$1.28
Calabacita	4	5	5	5	4.75	5	$1.28
Cilantro	6	10	1	3	5	6	$1.24
Chili Serrano	7	7	7	7	7	7	$0.92
Anaheim Pepper	8	6	8	8	7.5	8	$0.83
Chili Habanaro	9	9	9	9	9	9	$0.24
Tutuma	10	8	10	10	9.5	10	$0.10

** Avg Exp (Expenditures); includes all consumer responses (whether or not the respondent purchased a particular item, or reported "0").*

*** Avg Exp (Expenditures); includes only consumers who purchased the item (excludes purchases equal to 0).*

Table 6.1.d. Ethnic Produce Survey Ranking:

Puerto Rican Respondents

Produce	Rank Based on Criteria						Expenditure
	Avg Exp* (Includes all respondents)	Avg Exp** (Purchasers only)	Produce Purchase Frequency	Volume of Produce Bought	Average Rank	Overall Rank	Avg Exp* (Includes all respondents)
Batata	1	4	2	1	2	1	$1.74
Aji Dulce	3	2	4	3	3	2	$1.58
Cilantro	2	8	1	2	3.25	3	$1.68
Calbaza	4	9	3	4	5	4	$0.96
Fava Beans	6	6	6	6	6	5	$0.63
Pepinillo	5	10	5	5	6.25	6	$0.70
Chili Caribe	7	3	8	9	6.75	7	$0.56
Berenjena	8	7	7	7	7.25	8	$0.51
Calabacita	9	5	9	8	7.75	9	$0.43
Verdolaga	10	1	10	10	7.75	10	$0.10

** Avg Exp (Expenditures); includes all consumer responses (whether or not the respondent purchased a particular item, or reported "0").*

*** Avg Exp (Expenditures); includes only consumers who purchased the item (excludes purchases equal to 0).*

Supply: Production Research Prioritization. In addition to assessment of the survey demand, crops were also evaluated for production research potential (research interest/uniqueness, maximum/cross-ethnicity impact, cultivar comparisons, etc.) by field study participants at each site. The crops that remained after automatic elimination from production candidacy due to low survey demand, were re-evaluated based upon supply-side potential, consolidated across ethnic groups (i.e. duplicates removed or replaced by another variety, where available) to maximize production research, and re-prioritized to identify crops for replicated and demonstration production trials. This process resulted in a proposed list of 28 production research crops (Govindasamy, 2007). Seasonality

factors and seed availability issues prompted the decision to include just 22 of these crops (12 replicated/research and 10 demonstration crops; Table 6.5) in actual trials implemented at six sites, leaving six plots at each site for ethnic crops of each respective cooperator's choice.

Table 6.2. Production Crop Selection

Ethnic Group	Plot Type	Ethnic Crop Name	Scientific Name
Chinese	Research	Baby Pak Choy	*Brassica rapa* L. ssp *chinensis*
		Oriental Eggplant	*Solanum melongena* L.
		Smooth Luffa	*Luffa aegyptiaca* Mill. (or *L. cylindrica* (L) M. Roemer)
	Demo	Edamame	*Glycine max* (L.) Merr.
		Napa Cabbage	*Brassica rapa* L. ssp *chinensis*
		Oriental Spinach	*Spinacia oleracea* L.
		Pak Choy	*Brassica rapa* L. ssp *chinensis*
		Snow Peas	*Pisum sativum* L. var. *macrocarpon*
Asian Indian	Research	Bottle Gourd	*Lagenaria siceraria* (Mol.) Standl.
		Eggplant (Raavayya)	*Solanum melongena* L. var. Raavayya
		Eggplant (Bharta)	*Solanum melongena* L. var. Bharta
		Ridged Gourd	*Luffa acutangular* (L.) Roxb.
	Demo	Fenugreek Leaves	*Trigonella foenum-graecum* L.
		Mint Leaves (Spearmint)	*Mentha spicata* L.
Mexican	Research	Chili Jalapeno	*Capsicum anuum* L.
		Tomatillo	*Physalis philadelphica* Lam. (or *P. ixocarpa* Brot.)
	Demo	Calabacita	*Cucurbita pepo L.*
		Chili Pablano/Ancho	*Capsicum anuum* L.
Puerto Rican	Research	Aji Dulce	*Capsicum chinense* Jacq
		Batata	*Ipomoea batatas* (L.) Lam.
		Pepinillo/Bitter gourd	*Momordica charantia* L.
	Demo	Cilantro/Coriander	*Coriandrum sativum* L.

6.2. Production Trials and Research Program

Upon completion the first phase of the ethnic produce project related to consumer survey results, the second phase of the project began its focus on crop production research and demonstration. The four primary objectives of this phase were to;

1) establish a common set of field demonstration and research plots in each collaborating state;
2) demonstrate and evaluate a variety of ethnic crops grown at each site;
3) conduct case-studies of specialty-ethnic produce growers; and
4) communicate ethnic crop production information to advisors and growers via presentations, tours, websites, fact sheets, articles, and other forms of informational literature.

Six sites located in three states along the East Coast: two in Florida, one in Massachusetts, and three in New Jersey, were established to conduct the ten demonstration crops and twelve research crops selected on previously described criteria.

Crop quality and yield parameters were developed in order to make recommendations for geographic sequencing of production, by month/season, to sustain a twelve month production supply in the eastern United States.

7. CONCLUSIONS, RECOMMENDATIONS, AND FURTHER RESEARCH

The approach outlined in this paper uses a detailed market driven assessment and then custom tailors field production research and supportive applied studies to bolster and drive the market study. This method bridges the gap between consumer, distributors, and growers through a strategic approach to new crop introduction and marketing and a critical research link to specific consumer demands.

1,084 surveys from a statistically representative sample of Chinese, Indian, Mexican and Puerto Rican residents along the East Coast were utilized to assess ethnic consumers'

characteristics, patterns of purchase, and propensity to purchase ethnic produce. Results analysis and relative benchmark comparisons were conducted to highlight general, social, and economic characteristics somewhat unique to these specific ethnic consumer groups.

Ethnic Consumer Characteristics

Survey results revealed that a majority of the principal shoppers from each of these ethnic groups were female, most commonly between the ages of 36 to 50 years of age, typically from households with two to four members (with slightly larger households and more children under the age of 18 found in the Hispanic relative to the Asian sub-groups, generally consistent with the respective national populations). The age distribution of shoppers each ethnic group seemingly correlated with the respective Census data at a national level, and revealed that shoppers (national populations) from the Hispanic sub-groups are on average younger than their Asian sub-group counterparts (respective national populations, as well as the overall population at large).

The social and economic characteristics of survey respondents from each group were generally consistent with national averages for each respective ethnic group. More than half of the respondents from each group completed at least two or more years of college, with more Asians than Hispanics completing four years or more and with Asian Indians the high (most educated) extreme. Similarly, more than half of the respondents from each group were married, with more Asians than Hispanics in this category, seemingly correlated with respondent age (i.e. younger and more single respondents from the Hispanic relative to the Asian sub-groups). Roughly two thirds or more of respondents from each group were employed, whether self-employed or by someone else. Roughly half or more of respondents from each group made under $60,000 per year, with higher percentages of Asian Indians falling into higher income categories relative to respondents from the other three ethnic groups. The higher incomes by Asian Indians followed closely by Chinese and relative to the Hispanic sub-groups, seemingly correspond to the higher education levels, both by Asian respondents and their respective national ethnic populations. Moreover, in terms of both income and education at a national level relative to mainstream America, the Asian and Hispanic sub-groups in question are above and

below the overall (and White alone) populations, respectively. Such a distinction between ethnic groups and White alone (or overall) is not as apparent in the case of marital status and employment, as the proportions across the four ethnic groups, Whites, and overall are somewhat comparable.

In terms of acculturation factors, a substantial majority of foreign-born respondents from the Asian sub-groups (86%-87%) were born in their country of ethnic origin, as compared to less than half from each of the Hispanic sub-groups. These Asian immigrants generally arrived to the United States at older ages than their Hispanic counterparts and lived, on average, most of their childhood years in their country-of-origin. Regardless of birthplace, more than three quarters of respondents from each ethnic group speak their respective ethnic language and roughly half have lived in their current city and/or state of residence for more than ten years. A majority of respondents from each group reside in either urban or suburban neighborhoods (and are roughly evenly distributed between), with just under a quarter of respondents from each of the Hispanic sub-groups living in rural areas.

Shopping Patterns and Propensity to Purchase

Average monthly ethnic produce expenditure per household ranged from $77 to $98 by ethnic group and averaged $86 across all respondents, with the Asian and Hispanic sub-groups above and below the mean, respectively. Respondents from the Chinese group shopped for ethnic produce six times per month or, on average two more visits per month than the other three ethnic groups. This was partially offset by higher spending per visit by Asian Indian respondents.

The most common places of purchase for all groups were ethnic produce were ethnic grocery stores and typical American grocery stores, which were most popular with Asian and Hispanic respondents, respectively. Community farmers' markets and on-farm/roadside markets were not as popular, visited by roughly a quarter or less of Hispanic respondents, and even fewer Asian respondents. Roughly one third of Mexicans

surveyed grow their own ethnic produce, as compared to a quarter or less from the other three groups (perhaps associated with a higher portion of Mexicans living in rural areas).

A majority of ethnic produce purchasers from each group (59%-78%), and just under half of the current non-purchasers (40%) indicated that they are (would be) 'more willing' to purchase ethnic produce that is sold in ethnic outlets (if made available). More than 80% of ethnic produce purchasers from each group live within twenty miles of ethnic grocery store/market. This corresponds with the maximum percentage (~85%) of purchasers that shop ethnic grocery stores. This suggests that while they prefer ethnic outlets, they may not be willing to travel more than 20 miles to an ethnic market.

Ethnic produce purchasers from each ethnic group consistently rated ethnic outlets more favorably than conventional outlets in terms of selection and price, relative to the other attributes compared (followed by freshness, quality, and packaging, in that order, for all groups). A maximum of roughly half (one quarter) of respondents from any group considered ethnic and conventional outlets the same (worse) in terms of attributes provided, suggesting more respondent indifference to outlet types with regard to freshness, quality and packaging, relative to selection and price. In terms of produce attributes, regardless of place of purchase, freshness and quality were consistent priorities among all four ethnic groups of current purchasers ('very important'' to $\geq$ 92% from each). Selection was consistently the third most commonly cited important attribute by all groups (somewhat/very important to $\geq$ 93%, very important to $\geq$ 72%), followed closely by store availability and price (important to $\geq$ 79%), and then language and packaging. These findings suggest that freshness and quality are critical to ethnic produce sales in general, but that consumers do not perceive these attributes to vary significantly between ethnic and conventional outlets. They do, however, place high importance on store availability and generally prefer ethnic to conventional outlets based upon (more) selection and (lower) price, where available. When asked about willingness to purchase based upon availability of specific attributes, roughly half or more purchasers from each group were receptive to produce grown on local farms and/or organically grown (in contrast to similar proportions that were *less* willing to purchase genetically

modified produce). Similarly, roughly half or more of the Chinese, Mexicans, and Puerto Ricans were receptive to newly introduced or country of origin labeling, but only a quarter or so of Asian Indians were receptive in this regard. Interestingly, the willingness expressed by non-purchasers was directionally similar to that of purchasers, but to a lesser degree, offset by more responses of uncertainty. Promotions of ethnic produce and/or outlet types should be tailored accordingly and highlight availability (location, freshness, and/or quality), selection, price, and locally and/or organically grown, (and COOL and new items) as appropriate.

In terms of delivering promotions, respondents from the Hispanic sub-groups are more likely to be influenced by advertisements than their Asian counterparts. On-site/in-store ads and out-of store ads were most effective with Hispanic respondents, influencing more than half from each sub-group (as compared to 18% to 38% from the Asian sub-groups). Point-of-purchase and visible-from-road ads influenced between one third and half of the respondents from each Hispanic sub-group (as compared to less than a quarter of respondents from the Asian sub-groups).

Half or more of respondents (purchasers) from each ethnic group were willing to pay more for ethnic produce than the comparable American or conventional substitutes. Specifically, roughly 25%, 15%-21%, 8%-15%, and 13% or less from each group were willing to pay maximums of up to 5%, 6%-10%, 11%-20%, or more than 20%, respectively. In general, Asian Indian respondents on average were slightly less likely to pay premiums for ethnic produce, relative to the other three groups. This is perhaps associated with the fact that half of the Asian Indian respondents were vegetarians (in contrast to 7% or less from the other three groups). This finding, combined with the fact that Asian Indians had slightly higher ethnic produce expenditures per household and a higher portion of their produce expenditures devoted to ethnic produce, may cause them to be less agreeable to higher ethnic produce prices than the other ethnic groups. As many are vegetarians, Asian Indians are a prime target for ethnic produce promotions, but associated pricing strategies by retailers should bear in mind their potential price elasticity limitations.

Produce Expenditures and Market Estimates

The typical monthly per person expenditure for all ethnic produce items purchased averaged $26 and ranged from $22 to $32 by ethnic group, with Asian and Hispanic sub-groups above and below the mean, respectively. The comparable total produce expenditure, inclusive of ethnic and American produce, averaged $37, ranged from $31 to $48 by ethnic group, and revealed that ethnic produce comprised more than 60% of total produce expenditures for each ethnic group surveyed (with Asian Indians at the high extreme at 82%). The same empirical ethnic produce expenditure data was also combined with Census population data to develop market estimates for the respective larger ethnic populations along the East Coast (adjusted downward for a survey-based estimate of ethnic consumers that do not purchase ethnic produce). The extrapolations resulted in upper and lower-bound estimates within a 90% Confidence Interval (and an associated margin of error for each ethnic group ranging from 5.37% to 5.64%) as follows; $245M to $296M for Chinese, $190M to $230M for Asian Indian, $281M to $362M for Mexican, and $531M to $655M for Puerto Ricans.

Subsequent production research will result in the recommendation of specific ethnic crops to address this local market. The data contained within this study provides key market sales information such as average quantities purchased, retail price points, and units of measures commonly purchased, to support the marketing and sale of these ethnic produce recommendations.

Further Research

Production research is currently underway to conduct field demonstration and research plot studies for specific ethnic crops, selected as a result of the survey data and analyses. These plots will be evaluated at multiple sites in three states where related specialty grower case studies and outreach/communication efforts are also underway to address the supply-side phase of the project.

Additional analysis of the survey sample expenditures and demographics as they correspond to consumer shopping patterns, preferences, and related practices, will be utilized to develop predictive demand models for the larger populations. These models will facilitate effective distribution efforts by enabling producers, wholesalers, and retailers to target appropriate markets and locations, based upon demographic profiles and geographic population concentrations. This will help to marry the supply with local demand, as appropriate, to optimize marketing efforts.

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APPENDIX: Ethnic Consumer Survey Outline and Questionnaire

Research Area	Sample Group	Research Objective	Specific Objective	Question(s)
Demand	Ethnic Consumers	Purchase Decision for Ethnic Fruits/Veg	Purchase Ethnic? *(past 12 months)*	#1a Y / N
Market Opportunity (non-purchaser)	Non-Purchasers of Ethnic Fruits/Veg	Purchase Decision(s) for not choosing Ethnic	Why no purchase?	#1b
Demand Factors (Ethnic Produce)	Purchasers of Ethnic Fruits/Veg	Purchase Patterns	Frequency *(w/in month)*	#2
	"	"	Spending *($s/visit)*	#3-4
	"	"	Location *(primary, where, proximity)*	#5-7
	"	"	Quantity *(lbs./bunch/#s per wk)* and	#8(Q)
	"	"	Price *($s per unit)* -or-	#8(P)
	"	"	Expenditure *($s per type)*	#8(E)
	"	Preferences/Opinions *(importance & potential)*	**P**roduct Attributes: Importance *(store & fruits/vege)*	#9
	"	"	**P**lace: *Compare by store (ethnic vs. conventional)*	#10
	"	"	**P**rice *(profit potential)*	#11
	Purchasers and Non-Purchasers	**Preferences/Opinions** ***(willingness & opportunity)***	**P**roduct/**P**romo	#12
	Purchasers	Related Practices	**P**romotion/**P**lace	#13-15
	"	Demographic Profile	Neighborhood	#16
		"	Residency *(years)*	#17
		"	Household *(#, < 17 years)*	#18-19
		"	Respondent *(age/ed/employ income/marital status/gender)*	#20-25
		"	Language/proficiency	#26
		"	Country *(origin/yrs in US)*	#27-28

Survey Complete

Ethnic Consumer Survey Questionnaire

Hello, I am calling on behalf of Rutgers University and the United States Department of Agriculture. <Language and ethnicity determination> We are conducting a survey to understand the trends in Ethnic consumers' fruits and vegetable purchases.

- *May I speak with the principal grocery shopper in your household?*

"N/A": ***"Is there a time when he/she will most likely be available?"*** **<Record and re-attempt>**

"No": ***"Thank you and have a pleasant day/evening"*** **<Terminate call>**

<New interviewee>: **Repeat above then continue below**

<Currently speaking>: **Continue with, *"Then please be aware that…"***

Your responses will remain anonymous. The information you provide will not be linked to you personally, but rather, will be combined with the responses of the other individuals that participate in the survey. Your voluntary participation will assist in the assessment and response to <Asian Indian/Chinese/Mexican/Puerto Rican> consumer trends and preferences.

It will take approximately five to ten minutes to complete this survey. May I proceed with asking you some questions about your fruits and vegetable purchases? Y/N

"Yes": **Proceed to questionnaire**

"No": ***"Thank you and have a pleasant evening"*** **<Terminate call>**

1a. *Have you purchased any <Ethnic group> fresh fruits or vegetables over the past 12 months?*

1.☐ Yes 2.☐ No

"Yes": **Proceed to question #2**

"No": **Follow-up with question 1b;**

1b. *What are your reasons for NOT purchasing? Please provide all reasons that contribute to your decision NOT to purchase.* **<If necessary, prompt/code all that apply>**

1.☐ *Do not like <Ethnic group> produce*
2.☐ *Lack of availability in American store*
3.☐ *Poor selection in American store*
4.☐ *Closest ethnic outlet is too far*
5.☐ *No ethnic store/outlet available*
6.☐ Other ***<"Please specify">***_____

Go to question #12, record response, and close with *"Since you have not purchased <Ethnic group> fresh fruits or vegetables over the past 12 months, that completes our survey. Thank you for your valued participation in this study."*

2. *Over the course of the year, how often do you typically purchase <Ethnic group> fruits and vegetables within a month?* XXXX times/visits

3. *On average, how much do you spend on <Ethnic group> fruits & vegetables per visit?* $XXX.XX

4. *On average, how much do you spend for all of your fruits & vegetables, in a month?* $XXX.XX

5. *Where do you tend to buy <Ethnic group> fruits & vegetable during the course of the year? Please indicate all places, even if only available seasonally, from the following:*
<Code all that apply>

1.☐ *Typical American grocery stores*
2.☐ *Ethnic grocery stores*
3.☐ *Community farmers' market*
4.☐ *On-farm markets or roadside stands*
5.☐ Other ***<"Please specify">***_____

6. *What portion of your <Ethnic group> fruits & vegetables are purchased at typical American grocery stores? Would you say, "ALL, MOST, SOME, or NONE"?*
<If necessary, provide examples of *"American grocery stores" such as; "A&P, Albertsons/ACME, Food Lion, Foodtown, Piggly Wiggly, Sam's Club/Walmart, and Wegmans"*>

1. ☐ All 2.☐ Most 3.☐ Some 4.☐ None

7. *How close to your home is the nearest <Ethnic group> grocery store or market?* XXXX miles
<If necessary, encourage to approximate, or code:>

☐ Not aware of such a store w/in 60 miles

8. *I am now going to read you, in your language of origin, the names of some <Ethnic group> fruits and vegetables. I will ask you for the quantity that you buy per week and the typical price that you pay for the item, regardless of where you purchase.*

<Respondent purchase data is to be collected and recorded, by produce item, as follows; Read first name listed for item. List alternate names, as needed, until respondent recognizes item. If necessary, prompt with *"pounds, bunches, or numbers"*. Code response accordingly. If necessary, prompt with *"either price per unit OR total purchase cost"*. Code as appropriate; only one of the two (price or purchase cost) need be recorded, as it will be used to estimate the other.>

No:	Name	Quantity/Week	Price/Unit	Total Purchase Cost
1		Lbs/bunch/numbers		
2		Lbs/bunch/numbers		
3		Lbs/bunch/numbers		
4		Lbs/bunch/numbers		
5		Lbs/bunch/numbers		
6		Lbs/bunch/numbers		
7		Lbs/bunch/numbers		
8		Lbs/bunch/numbers		
9		Lbs/bunch/numbers		
10		Lbs/bunch/numbers		

I am going to read to you a list of attributes, and ask you to rate the importance of each in terms of your decision to shop for and purchase <Ethnic group> fruits and vegetables.

9. *Please respond to each of the following with whether the attribute is "VERY, SOMEWHAT, or NOT" important:* **<If necessary, repeat categories and/or define attribute as indicated>**

	Very	Somewhat	Not important	Unsure
a) *Store Availability* ***(Location/Season)***	1.☐	2.☐	3.☐	4.☐
b) *Language* ***(Spoken/Understood/Labels/Ads)***	1.☐	2.☐	3.☐	4.☐
And specifically, in terms of the fruits and vegetables:				
c) *Selection* ***(Variety/Origin)***	1.☐	2.☐	3.☐	4.☐
d) *Freshness* ***(Ripeness/Maturity)***	1.☐	2.☐	3.☐	4.☐
e) *Quality* ***(Taste/Nutrition/Shelf-life)***	1.☐	2.☐	3.☐	4.☐
f) *Price* ***(per relative unit)***	1.☐	2.☐	3.☐	4.☐
g) *Packaging* ***(Type or pack size/units)***	1.☐	2.☐	3.☐	4.☐
h) Other ***<"Please specify">***:_____	1.☐	2.☐		

Now I will read you a few of those same attributes, and ask you to compare <Ethnic group> outlets to typical American or conventional establishments, based on each attribute.

10. *Please respond to the following with whether you find the <Ethnic group> outlets to be "BETTER, the SAME, or WORSE" than the conventional establishments, in terms of their fruits and vegetables:* **<If necessary, repeat categories and/or define as in #9 and below>**

	Better	Same	Worse	Unsure
a) *Selection is*	1.☐	2.☐	3.☐	4.☐
b) *Freshness is*	1.☐	2.☐	3.☐	4.☐
c) *Quality is* ***(Includes packaging)***	1.☐	2.☐	3.☐	4.☐
d) *Price is*	1.☐	2.☐	3.☐	4.☐
e) *Packaging* ***(Type or pack size/units)***	1.☐	2.☐	3.☐	4.☐
f) Other ***<"Please specify">***:_____	1.☐	2.☐	3.☐	4.☐

11. *Are you willing to pay more for <Ethnic group> fruits and vegetables than the comparable American or conventional substitutes, and if so, what percent more?* XXXX percent **("No" =0)**
<If necessary, prompt with, *"Would you say approximately 5, 10, 15, 20%, or more than 20%?">*

12. *If made available to you, would you be "MORE willing to buy, INDIFFERENT to, or LESS willing to buy" <Ethnic group> fruits and vegetables that are:*

<If necessary, repeat answer choices:>

	More willing	Indifferent	Less willing	Unsure
a) *Sold in <Ethnic group> outlets*	1.☐	2.☐	3.☐	4.☐
b) *Grown on local farms*	1.☐	2.☐	3.☐	4.☐
c) *Organically grown*	1.☐	2.☐	3.☐	4.☐
d) *Genetically modified*	1.☐	2.☐	3.☐	4.☐
d) *Labeled according to country of origin*	1.☐	2.☐	3.☐	4.☐
e) *Recently introduced or new to market*	1.☐	2.☐	3.☐	4.☐

13. *Which types of advertisements would influence your decision to purchase <Ethnic group> fruits & vegetables? Please indicate all types, even if not currently available, from the following:* **<Code all categories that apply, after providing examples listed>**

1.☐ *Out-of-store ads (media including radio, TV, newspaper, and on-line)*
2.☐ *Visible-from-road ads (such as billboards and on-farm or roadside stands promotions)*
3.☐ *On-site or in-store ads (displays, demos, brochures, posters/banners, or announcements)*
4.☐ *Point-of-purchase ads (price cards/tags or produce identification; labels/stickers)*
5.☐ None
6.☐ Other ***<"Please specify">***_____

14. *Do you grow <Ethnic group> fruits or vegetables for consumption at home?*
1.☐ Yes 2.☐ No

15. *Are you a vegetarian?*

1.☐ Yes 2.☐ No

The following information concerning you and your household are necessary for classification purpose. Again, your answers will be kept strictly confidential and used only to help us interpret the aggregate survey results.

16. *Is your neighborhood URBAN, SUBURBAN, or RURAL?*

1.☐ Urban 2.☐ Suburban 3.☐ Rural

17. *How many years have you been living in <City, State>?* XXXX years

18. *Including yourself, how many people are in your household?* XXXX people

19. *How many of the people in your household are age 17 or less?* XXXX people

20. *Which of the following ranges includes your age:* **<Read options>**

1.☐ *Less than 20*
2.☐ *21 to 35*
3.☐ *36 to 50*
4.☐ *51 to 65*
5.☐ *Over 65*

21. *What is the highest level of education equivalent that you have completed:* **<Read options>**

1.☐ *Less than 12th grade*
2.☐ *High school graduate*
3.☐ *2 year college degree*
3.☐ *4 year college degree*
4.☐ *Post graduate or advanced degree*

22. Which of the following best describes your current occupation? **<Read options>**

1.☐ *Employed by someone else*
2.☐ Self-employed
3.☐ *Retired*
4.☐ *Full-time Homemaker*
5.☐ *Unemployed*
6.☐ Other ***<"Please specify">***:_____

23. *Which of the following ranges includes the annual-income of your household before taxes:*

1.☐ Less than $20,000
2.☐ $20,000 to $39,999
3.☐ $40,000 to $59,999
4.☐ $60,000 to $79,999
5.☐ $80,000 to $99,999
6.☐ $100,000 to $124,999
7.☐ $125,000 to $149,999
8.☐ $150,000 to $199,999
9.☐ $200,000 or more

24. *Which of the following best describes your current marital status?* **<Read options>**

1.☐ Married
2.☐ Single
3.☐ Divorced
4.☐ Separated
5.☐ Widower
6.☐ Other ***<"Please specify">***:_____

25. **<Code based on interviewer's determination>**
1.☐ Female 2.☐ Male

26. *Do you speak your ethnic language?* **<If necessary, prompt to answer with *"Yes" or "No">**

1.☐ Yes 2.☐ No 3.☐ Somewhat/very little **<Only if indecisive>**

27. *Where were you born?*

1.☐ *U.S.* 2.☐ *<Country of Ethnic origin>* 3.☐*Other (please specify)*:_____

"US": **(Skip question #28) Read final statements and then terminate call**
<Country of Ethnic origin> ***or*** *"Other":* **proceed to question #28**

28. *How old were you when you arrived in the US?* XXXX Years

Our survey is now complete. Thank you for your valued participation in this study.

<If necessary at any time during the survey, provide project sponsor information and contacts below:>

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