

## Selected Dietary Intake among Californians of Korean Descent : Preliminary Findings\*

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Research on diet, acculturation, and ethnicity has suggested that immigrants dietary patterns differ from people who do not have immigration experience. The purpose of this paper is to present preliminary descriptive findings concerning consumption of foods that are common in Korean and American diets, by people of Korean descent residing in California. Adults (18 years of age or older, N=1334) of Korean descent who could be reached by listed residential telephone number in California were randomly selected and telephone-interviewed by closely supervised bilingual (Korean-English) interviewers who were specially trained for this task. This study found that dietary patterns of Koreans living in California differed according to age and gender; also, the frequency of consumption of foods differed according to number of years of residence and acculturation. Koreans who reported higher levels of acculturation to American society ate less of traditional Korean foods such as Kimchi and ate significantly more higher-fat foods common in the American diet. Increased acculturation was also related to an increased frequency of alcohol drinking. Older Koreans tended to eat slightly more of traditional foods such as rice, Kimchi, fruits, and fish, compared to younger Koreans. Women tended to eat healthier foods than men, consuming green vegetables, Kimchi, milk, cheese/yogurt, fruits, and bread more frequently. Koreans reporting longer residences in the United States reported a greater consumption of pork, bread, and soda.

**Key words :** frequency of food consumption, acculturation, Korean immigrants

### INTRODUCTION

According to the U.S. Department of Health and Human Services, healthful eating patterns can reduce the risk for chronic diseases including heart disease, certain cancers, stroke, and osteoporosis, which are leading causes of death and disability among Americans. A healthy diet can also reduce major risk factors for chronic disease including high blood pressure, high blood cholesterol, and obesity.<sup>1)</sup>

Korean-Americans are the fifth largest ethnic minority group of the 14 different subgroups of the Asian and Pacific Islanders in California. The population of residents of Korean descent in California is rapidly growing, with a 153.4% increase from 1980 to 1990,<sup>2)</sup> and a further increase of 133 percent from 259,941 in 1990 to 345,882 in 2000.<sup>15)</sup> Dietary practices are an important part of the Korean ethnic identity.<sup>3-4)</sup> The Korean food belief system is connected to Korean traditional medicine especially

among the elderly.<sup>4)</sup> For example, Koreans believe that ginseng builds strength and increases energy.<sup>4)</sup> Korean meals basically consist of rice, soups, Kimchi, and many side dishes including foods such as fish, meat, or poultry, as well as vegetables such as bean sprouts, mushrooms, Korean leeks, and dark green leafy vegetables. Common ingredients of Korean dishes include ginger, red pepper, and garlic. However, dairy products and milk are not part of the traditional dietary pattern.<sup>4-7)</sup>

Research on diet, acculturation, and ethnicity has suggested that immigrants dietary patterns differ from those people who do not immigrate.<sup>8-9)</sup> However, further research is needed.<sup>3)4)9)</sup> Research clearly shows that food habits are influenced by culture, and that variations in dietary patterns demarcate ethnic groups.<sup>3)9)</sup> Although Korean immigrants assimilate at a slower rate and are more likely to maintain cultural traditions than some other immigrant groups,<sup>4)</sup> specific variations in health and dietary practices have not been linked to levels of acculturation among Koreans who have immigrated to America. The purpose of this paper is to present preliminary findings concerning the consumption of selected foods among people of Korean descent who reside in California.

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## METHODS AND MATERIALS

### 1. Sample

Sampling was designed to represent the adult population of California who are of Korean descent, and the survey followed procedures approved by the Institutional Review Board (IRB) at San Diego State University.

Data reported in this paper were drawn from a preliminary analysis of a sample of telephone interviews with adults (18 years of age or older) of Korean descent who could be reached by listed residential telephone in California (N=1334). Interviewing was conducted by closely supervised bilingual (Korean-English) interviewers after substantial training. Approximately 80% of eligible persons contacted participated in the study following an IRB consenting process; up to four repeated calls were used to contact respondents.

The sample was constructed from all households in California that were listed in the telephone directory under a Korean surname. Although this process might exclude some spouses who assumed surnames of non-Korean partners, we assume that the rate of actual intermarriage is low. We further assume that the use of unlisted telephone numbers among Koreans in the state is low. Although some biases may exist in this sampling frame, it was the most comprehensive that we could develop; all demographic variables present considerable variation, and we have no strong a priori reason to assume bias. The most recent birthday method was used to randomly select participants among adults in each household.

### 2. Acculturation

A scale developed by Suinn-Lew and colleagues,<sup>10-11</sup> based on samples of Asian university students, was adapted for our purposes. Questions included in the questionnaire were designed to measure aspects of cultural preferences involving language, music, food, self-identification - including how the self was identified with America and Korea, fathers self-identification, social linkages including ethnicity of peers, and preferred associations. Reported percentages of total years of education and of years of living in America were added to the original scale in this analysis.

The percentages were highly correlated with other indicators used in the original Suinn-Lew scale. Answers to the acculturation questions were subjected to a principal components analysis. Although two components emerged from the analysis using the customary eigen value of 1.0 as a cutoff, it appeared that a single general dimension underlay the bulk of total variance common to the items.

Variables selected for final analysis of the levels of acculturation of Korean Americans included 3 questions

each in the categories of language use, education and living experience in the U.S., friends and community association, perceptions on ethnic identity of self and father, and cultural preferences for music and foods. The final acculturation scale values were produced by adding the converted common measurement (Z-scores) of 15 selected questions (3 questions for 5 categories), and then divided into three groups as equal in number as possible for further analysis.

## RESULTS

### 1. Demographics

The mean age of the 1,334 respondents was 45.5 years (SD=15.1), their mean years of education were 6.1 (SD=7.8) in the U.S. and 11.7 years (SD=5.3) in Korea, the mean number of persons in the household was 3.2 (SD=1.5), and mean household income was \$45,914 (SD=\$23,337). About 57 percent of those interviewed were female, 17.9 percent were single, 73.3 percent married, 5.9 percent widowed, and 2.5 percent divorced. Nearly 94 percent were born in Korea, while 98.9 percent reported having a father born in Korea and 98.8 percent having a mother born in Korea.

Mean years lived in the U.S. was 17.1 (SD=9.3), mean years lived in Korea was 27.5 (SD=14.5), mean height was 5.4 feet (SD=0.3 feet) and mean weight was 137.8 pounds (SD=27.2). About 78 percent reported being first generation immigrants.

### 2. Food Consumption

The most frequently consumed foods among Koreans residing in California contribute to a healthy diet composed with foods of high nutrient density. According to data in Table 1, below, respondents reported eating rice an average of once a day, and Kimchi, fruits, and green vegetables slightly less than once a day. Coffee, yellow and white vegetables, eggs, and fish were consumed slightly more than 1-3 times a week, while beef, noodles, milk, and sodas were consumed slightly less frequently on average. Chicken, cheese/yogurt, fried foods, oil based dressings, pork, and butter/margarine were eaten an average of somewhat less than once a week, and alcohol was consumed less than once a month.

Older Korean residents of California tended to eat slightly more of the traditional foods than younger persons. Older persons reported eating more rice, Kimchi, fruits, and fish than younger persons, according to the mean frequencies of consumption reported in Table 2. Younger persons reported greater consumption of beef, pork, chicken, eggs, cheese/yogurt, fried foods, oil based dressings, butter/margarine, alcohol, and soda than older

**Table 1.** Mean Frequency of Eating Selected Foods among Californians of Korean Descent, 2002<sup>a</sup>

Food	Mean	95% CI		N
Beef	1.99	1.95	2.03	1331
Pork	1.22	1.18	1.26	1331
Chicken	1.66	1.62	1.70	1333
Eggs	2.21	2.15	2.27	1329
Fish	2.10	2.06	2.14	1332
Rice	4.05	4.01	4.09	1333
Noodles	1.94	1.90	1.98	1333
Bread	2.54	2.48	2.60	1330
Green Vegetables	3.38	3.32	3.44	1332
Yellow-White Vegetables	2.70	2.64	2.76	1332
Kimchi	3.53	3.47	3.59	1333
Milk	1.95	1.85	2.05	1329
Cheese/Yogurt	1.59	1.51	1.67	1328
Fruits	3.49	3.43	3.55	1333
Fried Food	1.32	1.26	1.38	1332
Oil Based Dressing	1.30	1.24	1.36	1328
Butter/Margarine	1.22	1.16	1.28	1331
Alcohol	0.79	0.73	0.85	1326
Coffee	2.80	2.70	2.90	1326
Soda	1.78	1.70	1.86	1324

a. Cell entries are mean frequency of eating each food, the 95 percent confidence interval, and item N's. N's may vary slightly from the marginal N's in last row of table due to missing data. Respondents were asked: "About how frequently do you eat each of the following foods: Twice a day or more (coded 5), once a day (coded 4), 4-6 times a week (coded 3), 1-3 times a week (coded 2), 1-2 times a month (coded 1), or less often (coded 0)?"

**Table 2.** Mean Frequency of Eating Selected Foods by Age among Californians of Korean Descent, 2002<sup>a</sup>

Food	Age				F	P<
	18-34	35-44	45-64	65+		
Beef	2.21	2.04	1.92	1.72	14.15	.001
Pork	1.35	1.34	1.12	1.03	9.10	.001
Chicken	1.91	1.71	1.59	1.32	19.93	.001
Eggs	2.30	2.40	2.14	1.86	9.81	.001
Fish	1.72	2.12	2.22	2.42	30.47	.001
Rice	3.80	4.07	4.14	4.24	14.23	.001
Noodles	2.00	1.97	1.85	2.02	2.73	.050
Bread	2.64	2.61	2.45	2.50	2.05	NS
Green Vegetables	3.24	3.39	3.49	3.27	4.25	.010
Yellow-White Vegetables	2.57	2.72	2.79	2.60	3.10	.050
Kimchi	3.14	3.65	3.68	3.61	16.26	.001
Milk	2.02	1.95	1.84	2.15	1.66	NS
Cheese/Yogurt	1.88	1.74	1.38	1.30	12.87	.001
Fruits	3.18	3.46	3.65	3.63	14.75	.001
Fried Food	1.88	1.40	1.05	.88	65.54	.001
Oil Based Dressing	1.44	1.44	1.20	1.10	6.78	.001
Butter/Margarine	1.52	1.38	1.02	.92	16.40	.001
Alcohol	1.00	.83	.62	.85	7.63	.001
Coffee	2.15	3.22	2.98	2.63	24.05	.001
Soda	2.48	1.89	1.52	.99	46.83	.001
(N)	(316)	(355)	(488)	(173)		

a. Cell entries are mean frequency of eating each food. For purposes of analysis, two or more times a day was coded 5, 1 time a day 4, 4-6 times a week 3, 1-3 times a week 2, 1-2 times a month 1, and less than 1 time a month was coded 0. Statistics were computed using one-way analysis of variance. N's may vary slightly from the marginal Ns in last row of table due to missing data.

**Table 3.** Mean Frequency of Eating Selected Foods by Gender among Californians of Korean Descent, 2002<sup>a</sup>

Food	Gender		F	P<
	Male	Female		
Beef	2.14	1.88	28.48	.001
Pork	1.39	1.09	38.85	.001
Chicken	1.76	1.58	14.60	.001
Eggs	2.25	2.19	.79	NS
Fish	2.07	2.12	.99	NS
Rice	4.02	4.08	1.50	NS
Noodles	1.96	1.93	.24	NS
Bread	2.43	2.62	7.06	.010
Green Vegetables	3.29	3.44	6.37	.050
Yellow-White Vegetables	2.66	2.72	1.04	NS
Kimchi	3.44	3.60	6.26	.050
Milk	1.77	2.08	11.10	.001
Cheese/Yogurt	1.45	1.68	9.42	.010
Fruits	3.27	3.65	45.77	.001
Fried Food	1.46	1.21	21.27	.001
Oil Based Dressing	1.27	1.33	.92	NS
Butter/Margarine	1.14	1.28	3.92	.050
Alcohol	1.30	.42	225.36	.001
Coffee	2.73	2.86	1.66	NS
Soda	2.21	1.45	83.81	.001
(N)	(568)	(763)		

a. Cell entries are mean frequency of eating each food. For purposes of analysis, two or more times a day was coded 5, 1 time a day 4, 4-6 times a week 3, 1-3 times a week 2, 1-2 times a month 1, and less than 1 time a month was coded 0. Statistics were computed using one-way analysis of variance. N's may vary slightly from the marginal Ns in last row of table due to missing data.

persons. Older and younger persons reported a greater consumption of noodles but a lower consumption of green and yellow or white vegetables than middle aged persons. No statistically significant relationship between age and consumption of bread or milk was found in the sample.

The data suggest that female Korean residents of California tended to eat healthier foods than males. Women more frequently consumed green vegetables, Kimchi, milk, cheese/yogurt, fruits, and bread than men according to the data in Table 3. Men reported eating beef, pork, chicken, fried foods, and soda more frequently than women. Men drank alcohol much more frequently than women. No statistically significant differences in frequency of consumption of eggs, fish, rice, noodles, yellow/white vegetables, oil based dressings, or coffee were reported between men and women.

Length of time lived in the United States was related to frequency of consumption of fewer foods than gender or age according to data in Table 4. Length of time in the United States was trichotomized for purposes of analysis into intervals of 12 or fewer years, 13-20 years,

and 21 or more years. Koreans reporting longer periods of residence in the United States reported greater consumption of pork, bread, and soda, while those reporting shorter residences reported higher consumption of rice and Kimchi. Those residing for 13-20 years reported consuming significantly more eggs and milk than those reporting shorter or longer residences. No statistically significant differences in frequency of consuming other foods were associated with length of residence.

Acculturation was related to consumption of most foods according to the data in Table 5. Acculturation was measured using an adaptation of the Suinn-Lew acculturation scale<sup>10-11)</sup> and methods used by other studies,<sup>12)14)</sup> which were adapted for use with Korean adults in California. Koreans who reported higher levels of acculturation to American society ate the following items significantly more frequently : beef, chicken, bread, green vegetables, cheese/yogurt, fried foods, oil based dressings, butter/margarine, soda, and alcohol. More acculturated Koreans also reported eating fish, rice, and Kimchi less frequently, while those with medium acculturation reported eating eggs more frequently.

**Table 4.** Mean Frequency of Eating Selected Foods by Years in US among Californians of Korean Descent, 2002<sup>a</sup>

Food	Years in US			F	P<
	0-12	13-20	21+		
Beef	1.85	1.97	2.13	2.97	NS
Pork	1.19	1.21	1.24	19.58	.001
Chicken	1.39	1.60	1.93	1.95	NS
Eggs	2.11	2.35	2.17	8.55	.001
Fish	2.19	2.18	1.95	2.35	NS
Rice	4.41	4.11	3.69	26.91	.001
Noodles	1.89	1.95	1.98	.18	NS
Bread	2.25	2.56	2.77	6.52	.010
Green Vegetables	3.21	3.41	3.46	1.36	NS
Yellow-White Vegetables	2.65	2.74	2.69	.47	NS
Kimchi	3.94	3.69	3.02	31.25	.001
Milk	1.90	2.07	1.91	3.31	.050
Cheese/Yogurt	1.34	1.54	1.83	.42	NS
Fruits	3.52	3.51	3.40	.00	NS
Fried Food	1.05	1.28	1.57	3.00	.051
Oil Based Dressing	1.04	1.30	1.52	1.43	NS
Butter/Margarine	.94	1.16	1.52	1.16	NS
Alcohol	.68	.79	.89	.19	NS
Coffee	2.72	2.94	2.72	.05	NS
Soda	1.47	1.88	1.91	8.81	.001
(N)	(451)	(430)	(445)		

a. Cell entries are mean frequency of eating each food. For purposes of analysis, two or more times a day was coded 5, 1 time a day 4, 4-6 times a week 3, 1-3 times a week 2, 1-2 times a month 1, and less than 1 time a month was coded as 0. Length of time in the United States was measured by asking: "About how many years have you lived in the U.S.?" Years in the U.S. were trichotomized into three groups as nearly equal in N as possible. Statistics were computed using one-way analysis of variance. N's may vary slightly from the marginal N's in last row of table due to missing data.

**Table 5.** Mean Frequency of Eating Selected Foods by Acculturation to US Society among Californians of Korean Descent, 2002<sup>a</sup>

Food	Acculturation			F	P<
	Low	Medium	High		
Beef	1.85	1.97	2.13	11.00	.001
Pork	1.19	1.21	1.24	.28	NS
Chicken	1.39	1.60	1.93	42.88	.001
Eggs	2.11	2.35	2.17	4.77	.010
Fish	2.19	2.18	1.95	9.46	.001
Rice	4.41	4.11	3.69	79.74	.001
Noodles	1.89	1.95	1.98	.98	NS
Bread	2.25	2.56	2.77	18.13	.001
Green Vegetables	3.21	3.41	3.46	5.97	.010
Yellow-White Vegetables	2.65	2.74	2.69	.58	NS
Kimchi	3.94	3.69	3.02	76.45	.001
Milk	1.90	2.07	1.91	1.32	NS
Cheese/Yogurt	1.34	1.54	1.83	14.09	.001
Fruits	3.52	3.51	3.40	1.85	NS
Fried Food	1.05	1.28	1.57	29.02	.001
Oil Based Dressing	1.04	1.30	1.52	18.63	.001
Butter/Margarine	.94	1.16	1.52	24.02	.001
Alcohol	.68	.79	.89	3.46	.050
Coffee	2.72	2.94	2.72	2.16	NS
Soda	1.47	1.88	1.91	9.71	.001
(N)	(358)	(420)	(466)		

a. Cell entries are mean frequency of eating each food. For purposes of analysis, two or more times a day was coded 5, 1 time a day 4, 4-6 times a week 3, 1-3 times a week 2, 1-2 times a month 1, and less than 1 time a month was coded 0. Acculturation was measured using the Suinn-Lew acculturation scale adapted for use for telephone interviews administered by telephone. For the specific construction of the scale and related statistics used here see Lee, Hofstetter, Hovell, Park, Paik, & Faller (2002).<sup>19</sup> Scale values were trichotomized into three groups as nearly equal in N as possible. Statistics were computed using one-way analysis of variance. N's may vary slightly from the marginal N's in last row of table due to missing data.

## DISCUSSION

The purpose of this paper was to present descriptive data on the frequency of consuming foods that are common in Korean and American diets, in the hope of beginning to understand the impact of exposure to American culture. The data were drawn from a preliminary analysis of a survey of Koreans residing in California. Koreans in California frequently eat traditional foods such as Kimchi, rice, vegetables, fish, and eggs. Among the frequently consumed foods are also breads, a food broadly consumed throughout the world. It is also clear that the quality of the diets reported in this representative sample of Koreans in California varied depending on a number of variables including acculturation.

As expected, acculturation is related to a lower consumption of traditional Korean foods such as Kimchi and a greater consumption of foods common in the American diet that are relatively high in fat or simple sugars, such as beef, eggs, oil based dressing, butter/margarine, soda and fried foods.

Although several widely used and validated scales of acculturation to U. S. society have been developed by Cuellar and colleagues for Latino populations,<sup>14)</sup> only Lee and colleagues<sup>3),9)</sup> have published scales of acculturation computed from a large population based on samples of Korean adults. Other scales have been developed on relatively socially homogeneous samples of Asian university students, using paper and pencil questionnaires. In this study a scale developed by Suinn-Lew and colleagues<sup>10-11)</sup> based on samples of Asian university students was adapted for our purposes. Selected items were converted to a common measurement (Z-scores), and a principal components analysis was used for validation purposes. The study results could be used as a basis for developing validated acculturation scales for Korean descents living in the U.S., for future research.

Traditional social norms in Korea dictate that men drink alcohol while women and children do not. Transition to a more liberal American society, where health hazards are more publicized than in Korea, leads to the hypothesis that exposure to American society will decrease drinking among Korean men. Conversely, the role of women in U.S. culture has changed, with increased independence and "equality". This leads to the hypothesis that Korean women are more likely to drink alcohol as they are acculturated in the U.S. In this study, acculturation was related to increased frequency of drinking alcohol. These results might be accounted for by increased drinking opportunities of women in U.S. society and /or one might assume that Korean men pay little attention to health hazard warnings provided in the U.S. But we should be cautious in explaining these results because we were not able to collect data showing the

amounts of alcohol consumed.

Gender, age, and the length of residence in the United States were also related to the frequency of food consumption, albeit in somewhat different ways. Older Korean residents in California tended to eat traditional foods slightly more than younger persons, and women tended to eat healthier foods than men. A greater length of residence in the U.S. was related to a more frequent consumption of fat loaded and/or sugary foods. In conclusion, variations in age and gender resulted in somewhat different dietary patterns of behavior among Koreans in California; the extent of exposure to American culture, via the number of years of residence and level of acculturation, also influenced the frequency with which people consumed foods.

The limitation of this study is that the collected data do not measure the actual amounts of foods consumed by Korean-American adults but only indicate the frequency of consumption for selected food items. Untangling of the multiple paths of association is left for further research.

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