

## Food Consumption Patterns of First Generation Korean-Americans in Hawaii

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### Abstract

To evaluate food consumption patterns of first generation Korean-Americans in Hawaii, questionnaires were developed using sociodemographic questions and food frequency questionnaire, which included 139 food items most often consumed among Korean foods and American foods. The questionnaires surveyed 157 first generation Korean-Americans in Hawaii. Mean daily servings for the first generation Korean-Americans were calculated for 139 food items combined into 41 food groups based on similarity in nutrient composition and serving size. The food groups which were consumed in amounts over one serving per day for all subjects were rice, Kimchi, non-citrus fruit, vegetables, orange/green vegetables, oil/margarine and coffee/tea. All subjects consumed less than one serving of hotdogs, hamburgers, pizza and pancakes per week (0.14 serving per day). The most notable characteristic of food consumption for first generation Korean-Americans was that they consumed more Korean foods such as rice, Kimchi, soybean paste (Doenjang), soybean curd and seaweed than American foods. Compared with other groups based on age and gender, younger men showed significantly ( $p < 0.05$ ) more frequent consumption of beef/pork, sausages/hams/bacon and hamburgers. Older men were significantly ( $p < 0.05$ ) more likely to consume Doenjang and less likely to consume pizza and hamburgers. Daily servings were below the recommended level for the grains/bread/cereals group and fats/oils/sweets group for all subjects. Fruits/vegetables group servings exceeded the recommended 6-7 daily servings for all subjects except younger men, whereas meat/fish/eggs/legumes group servings exceeded the recommended 5 daily servings for younger men. In correlations of daily servings of selected foods among Korean foods and American foods with sociodemographic characteristics, this study showed that the older the subjects and the shorter the stay in Hawaii, subjects were more likely to consume Korean foods.

**Key words:** food consumption patterns, Koreans, Hawaii

### INTRODUCTION

Ninety four years have passed since our Korean ancestors first immigrated into Hawaii in 1903. More than 35,000 Koreans now live in Hawaii(1). Korean-Americans living in Hawaii would assimilate into the American culture. Such cultural change could affect nearly every facet of life, including language, social values, economic status, living conditions and food habits. Since assimilators of a new culture may employ a mixed diet, the culture change might be related to the diet of first generation Korean-Americans.

When people are relocated from one society to another, differences in both customs and food production capabilities may influence the foods they eat. The American supermarket offer a large selection of food products which are generally convenient to prepare and one tends to feel more accepted by society if he has more or less the same food habits. For immigrant groups who are far removed

geographically from their country of origin, retention of their food habits may depend in part on the strength of their particular sub-culture within the host society. Among Chinese-Americans in California the extensive Chinese sub-culture provides cultural support for "traditional" food patterns and ensures the availability of their own foods. Nonetheless, considerable dietary change has occurred among immigrant groups(2,3). Natives of India who have migrated to the United States of America (U.S.A.) have also experienced dramatic alterations in their original patterns of vegetarianism and preparation of foods(4). Thus, several studies have reported on food habits of immigrants who have settled in the U.S.A. None of these, however, focused on food consumption patterns of Korean immigrants even though there have been reports on food beliefs and diets of pregnant Korean-American women and dietary calcium intakes of elderly Korean-Americans(5,6).

Many researchers have turned to the food frequency

questionnaire(FFQ) as a dietary method to collect information regarding usual food intake(7-13). FFQs allow classification of the usual intake of individuals into categories(14) and can be used to estimate intake over an extended period in the past. This study was designed to investigate food consumption patterns of first generation Korean-Americans in Hawaii using FFQ and to explore the relationships between daily servings of selected foods among Korean foods and American foods and sociodemographic characteristics of first generation Korean-Americans in Hawaii.

## METHODS

### Subjects and design

Subjects were recruited from a local community and questionnaires were completed by subjects during October and November, 1997. The subjects consisted of 157 first generation Korean-Americans in Hawaii. The age for participants was over 25 years old. The subjects were classified into two age groups, one from 25 to 49 years old and the other from 50+ years old. Approximately 39 percent of the subjects were men and 61 percent were women(Table 1).

A questionnaire was developed to assess present food consumption patterns and sociodemographic characteristics of Korean-Americans in Hawaii. The questionnaire included the following: (a) sex, age, employment, educational level, marital status, length of time in Hawaii, monthly household income and English language proficiency (b) a food frequency questionnaire consisting of 139 food items selected to represent both Korean and American foods.

### Food frequency questionnaire

The food frequency questionnaire was designed to assess food consumption patterns of first generation Korean-Americans in Hawaii. It included 139 food items most often consumed among Korean and American foods. The 139 food items were categorized in 5 food groups: grains/bread/cereals, meat/fish/eggs/legumes, fruits/vegetables, milk/cheese/yogurt and fats/oils/sweets.

Subjects were asked to determine how frequently they had consumed each food item during the preceding year by checking one of nine frequency categories. The standard

serving sizes derived from dietary guidelines for Koreans (15) and nationwide food consumption survey(16) were used for these foods.

For each food item, a daily number of servings was calculated for each individual. If a food item was consumed daily, no calculation was necessary. If a food item was consumed weekly, the weekly number of servings was divided by 7 to give the daily number of servings. Monthly number of servings was divided by 30, and yearly number of servings was divided by 365. Mean daily servings of the 139 food items were calculated based on daily number of servings for each individual.

### Data analysis

Data analyses were performed using the Statistical Analysis System(SAS)(17). Mean and standard deviations for the daily number of servings of the 41 food groups were determined. Analysis of variance(ANOVA) was used to determine possible differences in daily food consumptions among the groups based on age and gender; Duncan's multiple range test was used for post hoc comparisons if significant group differences were found. Pearson correlation coefficients were calculated to explore relationships between daily servings for selected foods among Korean and American foods and sociodemographic characteristics of first generation Korean-Americans in Hawaii.

## RESULTS AND DISCUSSION

### Description of subjects

The sociodemographic characteristics of the subjects are shown in Table 1. The subjects ranged in age from 25 to 85 years old; the mean ages were 39 years in the younger women group, 40 years in the younger men group, 65 years in the older women group and 66 years in the older men group.

Younger subjects had higher education and income levels than did older subjects. Approximately 60 percent of younger subjects reported monthly household incomes above \$ 3,000. Older men were more likely than older women to be married, and the latter were more often widowed. A notable characteristic among the subjects was that most of the younger women(88.7%) were employed. A small proportion of younger subjects, 13.2%

Table 1. Sociodemographic characteristics of the subjects

Characteristics	Women		Men	
	Younger <sup>1)</sup> (n=53)	Older(n=42)	Younger(n=34)	Older(n=28)
Mean age(yr)	39.7±7.1 <sup>2)</sup>	65.5±11.3	40.1±6.8	66.6±7.8
Employment				
Employed	88.7	28.6	100.0	42.9
Unemployed	11.3	52.5	0.0	14.2
Retired	0.0	18.9	0.0	42.9
Educational level				
1~6 years	0.0	31.0	0.0	21.4
7~12 years	47.2	54.8	35.3	42.8
13+ years	52.8	14.2	64.7	35.8
Marital status				
Married	73.6	40.5	79.4	78.6
Divorced	9.4	7.1	0.0	0.0
Separated	1.9	4.8	0.0	0.0
Widowed	3.8	45.2	0.0	21.4
Single	11.3	2.4	20.6	0.0
Monthly household income				
\$0.00~1,000	0.0	38.1	5.9	28.6
\$1,000~3,000	37.7	35.7	35.3	35.7
\$3,000~5,000	34.0	11.9	29.4	14.3
\$5,000+	28.3	14.3	29.4	21.4
English language proficiency				
Fluent	9.4	0.0	35.3	0.0
Good	15.1	4.8	23.5	14.3
Fair	62.3	35.7	35.3	50.0
Poor	11.3	35.7	5.9	14.3
None	1.9	23.8	0.0	21.4
Length of time in Hawaii				
0~5 years	17.0	2.4	8.8	7.1
6~10 years	28.3	11.9	20.6	14.3
11~20 years	34.0	42.9	35.3	42.9
21~30 years	20.7	35.7	29.4	28.6
31+ years	0.0	7.1	5.9	7.1

<sup>1)</sup>Younger=Age25-49yr; Older≥Age50+yr <sup>2)</sup>Mean±standard deviation

of women and 5.9% of men, were poor in English language proficiency, but a large proportion of older subjects, 59.5% of women and 35.7% of men, were poor in English language proficiency even though they have lived in Hawaii for a long time. The majority of subjects had immigrated to Hawaii after 1967, 38.8% of the subjects had immigrated between 1977 and 1986.

### Daily servings of food groups

The 139 food items were combined into 41 composite food groups in order to examine more general food consumption patterns. The objective of the grouping scheme was to combine foods that were similar in nutrient composition and serving size, while distinguishing foods that have been known as traditional Korean foods.

Where necessary, frequently consumed food items were assigned to unique groups, so their consumption could be assessed separately without masking foods less frequently consumed. Table 2 shows 139 food items combined into 41 food groups and mean daily number of servings of these food groups for first generation Korean-Americans in Hawaii.

The mean daily number of servings of food items included consumers and non-consumers(those who reported they never eat a food item) of the food items, but excluded individuals who did not know their usual food intake, or for whom a usual food intake was not ascertained.

The food group with the largest daily number of serving was rice for first generation Korean-Americans in Hawaii. The food groups which were consumed in

**Table 2. Mean daily servings of 139 food items combined into 41 food groups for first generation Korean-Americans in Hawaii**

Combined food groups	Servings per day	Food items
Milk, cheese, yogurt		
Skim/low-fat milk	0.38±0.23 <sup>1)</sup>	Skim milk, low-fat milk, yogurt
Whole milk	0.26±0.25	Whole milk
Ice cream	0.14±0.16	Ice cream
Cheese	0.21±0.17	Cheese, cottage cheese
Meat, fish, eggs, legumes		
Beef/pork	0.57±0.34	Beef, pork
Poultry	0.17±0.19	Chicken, turkey
Sausages/hams/bacon	0.22±0.18	Sausages, hams, bacon
Hotdogs	0.05±0.04	Hotdogs
Hamburgers	0.10±0.08	Hamburgers
Fish	0.80±0.42	Salmon, tuna, better fish, mackerel, flounder, hair-tail, sardine, anchovy, alaska pollack, yellow croaker
Squid/octopus	0.08±0.06	Squid, octopus, small octopus
Shell fishes/shrimps	0.18±0.13	Shell fish, scallops, shrimps, lobster
Eggs	0.45±0.33	Eggs
Soybean curd	0.51±0.27	Soybean curd(Tofu)
Soybean paste	0.57±0.29	Soybean paste(Doenjang)
Legumes	0.31±0.30	Soybean, black soybean, green beans, string beans, chili beans
Nuts	0.11±0.13	Peanuts, macademia nuts, other nuts
Grains, bread, cereals		
Rice	2.18±0.50	Brown rice, white rice, rice cake
Bread	0.53±0.33	Whole wheat bread, white bread, corn bread
Cereals	0.15±0.13	Cereals, oatmeal
Noodles/pasta	0.20±0.14	Noodles, pasta
Pancakes	0.11±0.08	Pancakes, muffins, waffles
Pizza	0.05±0.04	Pizza
Fruits		
Citrus fruits	0.54±0.37	Orange, tangerine, grape fruits
Non-citrus fruits	1.41±0.98	Apples, pears, bananas, plums, prunes, peaches, watermelon, strawberries, cantaloupe, melon, papayas, pineapples, mangoes, grapes, raisins, blueberries, persimmones, avocado
Fruit juices	0.40±0.26	Orange juice, grape juice, guava juice, other fruit juices
Vegetables		
Orange/green vegetables	1.25±0.54	Carrots, squash, spinach, lettuce, dropwort, chard, broccoli, kale, green pepper, red pepper
Vegetables	1.62±0.65	Cucumber, onion, head lettuce, egg plant, soybean sprout, cabbage, asparagus, cauliflower, celery
Kimchi	1.49±0.49	Korean cabbage, radish, leafy radish
Tomato	0.20±0.14	Tomato
Potatoes	0.20±0.18	Potato, sweet potato
Mushrooms	0.10±0.11	Mushroom, pine mushroom, oyster mushroom
Seaweed	0.42±0.30	Dried laver, sea mustard, sea lettuce, sea tangle
Fats, oils, sweets		
Oil/margarine	1.37±0.48	Vegetable oil, sesame oil, margarine
Mayonnaise/dressing	0.22±0.17	Mayonnaise, salad dressing
Butter/cream	0.86±0.42	Butter, cream, non-dairy creamer
Sugar products	0.63±0.47	Cakes, cookies, doughnuts, chocolate, candy, syrup, jam, jelly, pies, puddings
Carbonated beverages with sugar	0.35±0.21	Carbonated beverages with sugar
Low-calorie carbonated beverages	0.12±0.14	Low-calorie carbonated beverages
Coffee/tea	1.06±0.50	Instant and ground coffee, tea and herb tea
Beer/wine	0.21±0.17	Beer, wine

<sup>1)</sup>Mean±standard deviation

amounts over one serving per day for all subjects were 2.18 servings of rice, 1.62 servings of vegetables, 1.49 servings of Kimchi, 1.41 servings of non-citrus fruits, 1.37 servings of oil/margarine, 1.25 servings of orange/green vegetables and 1.06 servings of coffee/tea. All subjects consumed less than one serving of hotdogs, hamburgers, pizza, ice cream, pancakes, nuts, mushrooms, squid/octopus and low-calorie carbonated beverages per week(0.14 serving per day).

The notable characteristic of food consumption for first generation Korean-Americans was that they consumed more Korean foods such as rice, Kimchi, soybean paste(Doenjang), soybean curd(Tofu) and seaweed than American foods. The Korean-Americans consumed vegetables more frequently than meat, although meat such as beef or pork are relatively cheap in the U.S.A., and also showed more consumption of skim/low-fat milk than whole milk.

Thus, most of first generation Korean-Americans still strongly preferred the Korean foods. Food groups consumed frequently in Korea were also consumed frequently in Hawaii. Traditional food habits seem to influence present dietary practices of first generation Korean-Americans. Among three meals per day, lunch and dinner meals consisted mainly of Korean foods, although breakfast consisted of American foods and Korean foods. The tendency for Korean-Americans to consume a lot of Korean foods may be due to the large Korean community and the ready availability of Korean markets and restaurants in Hawaii.

Table 3 compared the mean daily servings of each gender and age group for 41 combined food groups. Compared with other groups, younger men showed significantly( $p < 0.05$ ) more frequent consumption of beef/pork, poultry, sausages/hams/bacon, hamburgers and eggs; they also showed significantly( $p < 0.05$ ) less frequent consumption of Doenjang, nuts and non-citrus fruits. Conversely, the consumptions of non-citrus fruits and vegetables of younger women were significantly ( $p < 0.05$ ) more than those of other subjects. Older men were significantly( $p < 0.05$ ) more likely to consume Doenjang and less likely to consume pizza, hamburgers, eggs and vegetables, and older women were significantly( $p < 0.05$ ) less likely to consume beef/pork, hamburgers and eggs.

The results indicated that younger subjects had more consumption of skim/low-fat milk than older subjects, and also less consumption of potatoes than older women,

but significant differences in their consumptions among these subjects were not detected. No differences in consumption of fish, soybean curd and seaweed were observed among age and gender groups. Other studies have shown that persons who emigrated from countries with lower fat intake to countries with high fat intake tend to adopt the high fat consumption patterns of the host country(18). In our study, although younger men have adopted more fatty foods than other groups as shown by consumptions of foods such as beef/pork, sausages/hams/bacon and hamburgers, it is evident that the first generation Korean-Americans have not adopted the high fat consumption patterns.

### Comparison with food group guidance

The 41 food groups were further combined into five food groups. Servings per day of five food groups for all subjects are compared with the recommended daily servings for Koreans(15) in Table 4. Daily servings were below the recommended level for the grains/bread/cereals and fats/oils/sweets groups for all subjects based on age and gender. Daily servings of the milk/cheese/yogurt group were also below the recommended level for all subjects except for younger men who consumed more than the recommended one daily serving. Fruits/vegetables group servings exceeded the recommended 6~7 daily servings for all subjects except younger men, whereas meat/fish/eggs/legumes group servings exceeded the recommended five daily servings for younger men.

There were small differences in servings of these five food groups among the age and gender groups—more servings of meat/fish/eggs/legumes group, fats/oils/sweets group and milk/cheese/yogurt group by younger men, and fruits/vegetables group by younger women. The data indicated that the frequency of consumption of the fruits/vegetables group was higher than for any of the other four groups. The tendency to consume a lot of vegetables and fruits may be due to the various kinds of vegetables and fruits which are abundant in Hawaii as well as their established food habit in Korea.

Meanwhile the 1990 dietary guideline for Americans recommend 2 to 4 servings of fruits and 3 to 5 servings of vegetables per day to achieve minimally acceptable levels of vitamin C, vitamin A and dietary fiber intake. Two servings of fruits and three servings of vegetables, which constitute the recommended minimum number of servings per day, are equivalent to approximately 17

Table 3. Mean daily servings of combined food groups for first generation Korean-Americans in Hawaii by gender and age groups

Combined food groups	Women		Men	
	Younger <sup>1)</sup> (n=53)	Older(n=42)	Younger(n=34)	Older(n=28)
Milk, cheese, yogurt				
Skim/low-fat milk	0.51±0.27 <sup>2)</sup>	0.31±0.17	0.38±0.25	0.30±0.23
Whole milk	0.24±0.21	0.38±0.23	0.23±0.37	0.19±0.17
Ice cream	0.07±0.06	0.06±0.09	0.32±0.39	0.10±0.09
Cheese	0.13±0.09	0.19±0.12	0.25±0.22	0.27±0.22
Meat, fish, eggs, legumes				
Beef/pork	0.51±0.34 <sup>ab</sup>	0.37±0.23 <sup>b</sup>	0.85±0.31 <sup>a</sup>	0.54±0.46 <sup>ab</sup>
Poultry	0.15±0.09 <sup>b</sup>	0.13±0.06 <sup>b</sup>	0.27±0.08 <sup>a</sup>	0.12±0.09 <sup>b</sup>
Sausages/hams/bacon	0.10±0.08 <sup>b</sup>	0.19±0.11 <sup>ab</sup>	0.37±0.34 <sup>a</sup>	0.23±0.20 <sup>ab</sup>
Hotdogs	0.04±0.03	0.04±0.04	0.08±0.07	0.04±0.03
Hamburgers	0.09±0.07 <sup>b</sup>	0.05±0.06 <sup>b</sup>	0.20±0.14 <sup>a</sup>	0.05±0.06 <sup>b</sup>
Fish	0.81±0.36	0.72±0.39	0.83±0.37	0.85±0.56
Squid/octopus	0.07±0.03 <sup>ab</sup>	0.04±0.02 <sup>b</sup>	0.13±0.12 <sup>a</sup>	0.08±0.07 <sup>ab</sup>
Shell fishes/shrimps	0.14±0.09	0.17±0.16	0.29±0.16	0.12±0.09
Eggs	0.49±0.37 <sup>ab</sup>	0.33±0.25 <sup>b</sup>	0.70±0.40 <sup>a</sup>	0.29±0.28 <sup>b</sup>
Soybean curd	0.50±0.36	0.48±0.23	0.59±0.21	0.48±0.28
Soybean paste	0.42±0.20 <sup>b</sup>	0.50±0.34 <sup>b</sup>	0.53±0.26 <sup>b</sup>	0.83±0.38 <sup>a</sup>
Legumes	0.41±0.31	0.36±0.35	0.27±0.28	0.20±0.26
Nuts	0.15±0.19 <sup>b</sup>	0.22±0.20 <sup>a</sup>	0.01±0.03 <sup>c</sup>	0.04±0.07 <sup>c</sup>
Grains, bread, cereals				
Rice	2.07±0.67 <sup>ab</sup>	2.01±0.48 <sup>b</sup>	2.35±0.41 <sup>a</sup>	2.29±0.45 <sup>ab</sup>
Bread	0.60±0.41	0.50±0.34	0.52±0.36	0.51±0.19
Cereals	0.21±0.12	0.21±0.19	0.08±0.11	0.08±0.09
Noodles/pasta	0.18±0.09	0.20±0.13	0.18±0.13	0.25±0.22
Pancakes	0.15±0.08	0.16±0.13	0.07±0.04	0.06±0.07
Pizza	0.07±0.06 <sup>a</sup>	0.07±0.06 <sup>a</sup>	0.04±0.03 <sup>ab</sup>	0.01±0.01 <sup>b</sup>
Fruits				
Citrus fruits	0.70±0.43	0.61±0.38	0.34±0.23	0.51±0.44
Non-citrus fruits	1.71±0.89 <sup>a</sup>	1.51±0.53 <sup>ab</sup>	1.09±0.50 <sup>b</sup>	1.33±0.56 <sup>ab</sup>
Fruit juices	0.35±0.21	0.39±0.19	0.50±0.31	0.37±0.34
Vegetables				
Orange/green vegetables	1.35±0.39	1.25±0.64	1.34±0.67	1.05±0.44
Vegetables	1.98±0.90 <sup>a</sup>	1.59±0.61 <sup>ab</sup>	1.85±0.66 <sup>ab</sup>	1.25±0.43 <sup>b</sup>
Kimchi	1.41±0.48	1.37±0.39	1.43±0.56	1.75±0.53
Tomato	0.19±0.09	0.22±0.13	0.22±0.19	0.17±0.13
Potatoes	0.24±0.22	0.27±0.18	0.13±0.15	0.16±0.16
Mushrooms	0.08±0.14	0.11±0.14	0.12±0.06	0.09±0.08
Seaweed	0.36±0.32	0.46±0.24	0.43±0.26	0.43±0.36
Fats, oils, sweets				
Oil/margarine	1.26±0.59	1.41±0.46	1.45±0.49	1.35±0.37
Mayonnaise/dressing	0.23±0.17	0.21±0.13	0.18±0.20	0.24±0.19
Butter/cream	0.92±0.56	0.91±0.44	0.75±0.49	0.85±0.42
Sugar products	0.72±0.51	0.53±0.31	0.73±0.57	0.53±0.47
Carbonated beverages with sugar	0.19±0.17 <sup>bc</sup>	0.04±0.03 <sup>c</sup>	0.73±0.37 <sup>a</sup>	0.45±0.26 <sup>ab</sup>
Low-calorie carbonated beverages	0.12±0.13	0.05±0.06	0.25±0.31	0.04±0.06
Coffee/tea	1.22±0.48	1.01±0.44	0.94±0.57	1.05±0.49
Beer/wine	0.12±0.15 <sup>ab</sup>	0.01±0.02 <sup>b</sup>	0.38±0.23 <sup>a</sup>	0.34±0.29 <sup>a</sup>

<sup>1)</sup>Younger=Age25-49yr; Older≥Age50+yr <sup>2)</sup>Mean±standard deviation

<sup>abc</sup>Within in a row, values not sharing a common superscript differed significantly according to one-way analysis of variance and Duncan's multiple range test(p<0.05)

**Table 4. Servings per day of five food groups consumed by first generation Korean-Americans in Hawaii**

Food group	Women		Men	
	Younger <sup>1)</sup> (n=53)	Older(n=42)	Younger(n=34)	Older(n=28)
	← servings/day →			
Grains, bread, cereals	3.28	3.15	3.24	3.20
svg/day recommended <sup>2)</sup>	4.00	3.50	5.00	4.00
Meat, fish, eggs, legumes	3.88	3.60	5.12	3.87
svg/day recommended	4.00	3.00	5.00	4.00
Fruits, vegetables	7.84	7.39	6.95	6.74
svg/day recommended	6.00	6.00	7.00	7.00
Milk, cheese, yogurt	0.95	0.94	1.18	0.86
svg/day recommended	1.00	1.00	1.00	1.00
Fats, oils, sweets	3.44	3.15	4.09	3.46
svg/day recommended	4.00	3.50	5.00	4.00

<sup>1)</sup>Younger=Age25-49yr; Older ≥ Age50+yr <sup>2)</sup>Servings per day recommended for Korean

**Table 5. Correlations of daily servings of the selected foods among Korean foods and American foods with sociodemographic characteristics for first generation Korean-Americans in Hawaii**

Food items	Subjects' age	Time in hawaii	English proficiency	Educational level	Employment	Household income
Rice	0.1597	-0.0241	-0.0662	0.0371	-0.0296	0.0297
Kimchi	0.1849	-0.3350*	-0.3376*	-0.3555**	-0.1613	-0.3114
Doenjang	0.4133**	-0.3073*	-0.4829***	-0.1594	-0.3496**	-0.2119
Soybean curd	-0.1386	-0.3572**	-0.1179	0.1908	0.1467	0.1328
Dried Laver	-0.0050	-0.0515	0.2063	0.1574	-0.0476	0.1476
Soybean sprout	-0.1166	-0.1778	-0.0063	-0.0647	0.0210	0.1274
Bread	0.0757	0.2328	0.1333	-0.0014	-0.1359	-0.0258
Hamburger	-0.2660	-0.0252	0.3370*	0.2127	0.2500	0.0241
Pizza	-0.1566	0.0260	0.1140	0.2483	0.2043	0.2658
Ham	-0.1787	-0.2066	0.2280	0.2281	0.1640	0.0010
Low-fat milk	-0.1859	0.2251	0.3121*	0.2748*	0.1202	0.2902*
Cheeze	0.1969	0.1914	0.0227	0.0964	0.0841	0.0266
Salad dressing	-0.0641	0.1454	0.2930*	0.1548	0.0215	0.3531**
Broccoli	-0.1897	0.0453	0.2567	0.3104*	0.1443	0.3149*

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

grams of dietary fiber. Current dietary recommendations for Americans suggest a minimum intake of 20 to 25 grams of fiber daily(19-21).

#### Correlations of daily servings of selected foods with sociodemographic characteristics

Pearson correlation coefficients were calculated between daily servings of selected food items and sociodemographic characteristics. Table 5 shows the correlations of daily servings of the selected foods among Korean foods and American foods with sociodemographic characteristics for first generation Korean-Americans in Hawaii. The significant positive associations(p<0.05) were found between the subjects' English proficiency and the frequency of consumption of hamburger and salad dressing, and also between subjects' educational level and the frequency

of consumption of low-fat milk and broccoli. Conversely, significant negative associations were found between the frequency of consumption of Kimchi and subjects' English proficiency(p<0.05) or educational level(p<0.01), and also between length of time in Hawaii and the frequency of consumption of Kimchi(p<0.05), Doenjang (p<0.05) and soybean curd(p<0.01). The frequency of consumption of Doenjang was positively associated with subjects' age(p<0.01) and negatively associated with subjects' English proficiency(p<0.001), employment(p<0.01) and length of time in Hawaii(p<0.05).

These results showed that the subjects were more likely to consume Korean foods, the older they were and the shorter their stay in Hawaii. The subjects with higher levels of education and better English proficiency consumed American foods more frequently. However, no

significant association was found between length of time in Hawaii and their consumption of American foods such as hamburgers, salad dressing, broccoli and pizza.

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