

A Nutrition Survey of Korean Adolescents Living in Los Angeles, California

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미국 캘리포니아주 나성에 거주하는 한국 중·고등학생들의 영양실태조사

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□ 국 문 초 록 □

나성의 한국 이주민의 자녀로서 사춘기에 문화권을 바꾸는 경험을 갖은 57인의 중고등 학생들을 대상으로 실시된 본 조사는 대상자의

- 1) 일반적 특성의 파악
- 2) 식습관 및 기호조사, 식품 섭취빈도 조사
- 3) 영양지식 및 그들 어머니의 영양지식 조사
- 4) 영양실태 조사를 통하여 식생활의 변화 및 문제점을 찾아 보았다.

영양실태조사는 24-hour diet recall 방법에 의하여 기본 4군, meal pattern 및 영양소를 추산하여 한국과 미국의 RDA와 비교하였다.

위의 실태조사 결과를 요약해 보면 ;

- 1) 한국전통음식인 밥과 김치는 저녁식사시 모두 섭취하고 있으나 아침, 점식은 미국식단의 사용율이 높았다. 기호도조사에 의하면 전반적으로 미국음식보다 한국음식을 더 좋아한다고 하였다.
- 2) 여학생은 아침식사, 남학생은 저녁식사가 불규칙하였다.
- 3) 여학생은 풍부한 과일의 섭취가, 남학생은 우유의 섭취가 한국에서의 식습관에 비해 그들의 건강을 위해 좋다고 하였다.
- 4) 영양지식의 근원은 어머니로부터가 가장 높았다. 여학생들은 철분의 급원 식품에 관한 지식이 남학생보다 부족했으며, 균형된 식단의 선택 점수는 남학생.

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보다 여학생이 높았다.

5) 기호조사 결과에 의하면 가장 싫어하는 식품은 간, 칠면조, 돼지고기, 고탄 요구르트, 아보카도, 올리브등이었고, 한번도 먹어보지 않은 식품은 부로콜리, 우설, 양고기, 망고, 탈지분유 등이었다. 이들 어머니의 기호조사 결과는 자녀들과 흡사하였으나 어머니들은 미국식품중 한번도 시도해 보지 않은 식품의 수가 그들 자녀보다 많았다.

6) 24 시간 diet recall 방법의 분석에 의하면 결핍된 영양소는 열량, 철분, 비타민 A 였다. 단백질 섭취량의 증가는 현저하였으나, 낮은 열량의 섭취는 이주민 자녀의 불규칙한 식습관의 일면과 동시에 우리나라 남학생들의 조리방법의 미숙한 면을 보여주었다.

INTRODUCTION

The nutritional problems in various communities among cultural groups are variable and to a greater degree require solutions appropriate for the respective groups.

Adolescence is the final and second most rapid period of growth. They undergo profound, complex and interrelated physical, physiological, mental, emotional and social changes.¹⁾ Also the adolescents are very interested in themselves and want to find out who they are, what they will be and struggle for self identities. For those adolescents who recently immigrated no one can deny that they are going through painfully stressful period. Besides the language barrier, the public high school in racially mixed area in U.S. goes through daily battle of survival among physically stronger black, Caucasian and Mexican students. Therefore, in order to help these immigrant adolescents grow up to be healthy citizens, the best possible efforts should be given to the study of their nutritional problems as well as other environmental circumstances.

The objectives of the study were:

- 1) To determine the adequacy or inadequacy of the diet of the Korean adolescents in Los Angeles.
- 2) To gather information about the food habits of Korean adolescents regarding eating habits, food preferences and other informations which would be of value in planning changes in their food habits, if a need for such a change is established.
- 3) To determine to what degree the subjects' native food habits have been retained, discarded or changed.

METHODS and MATERIALS

The subjects were 57 Korean students at Los Angeles High School between the age of 15 to 20 years. The survey was done during the April of 1974 and the questionnaires for the students were written in English and for the mothers were in Korean.

There were five parts in the study which contained the following:

1. Biographical information
2. Nutrition knowledge questionnaire
3. Preference and frequency test
4. 24-hour dietary recall
5. Mothers' nutrition knowledge and preference test

The questionnaires of the first three parts of the study were distributed and collected upon completion.

1) Biographical information

The questions to obtain biographical information were such as sex, age, education level of father, number of years in U.S., family size, parents' employment, meal pattern and other questions related to the subjects' food habits.

2) Nutrition knowledge questionnaire

There were 19 questions which covered the following areas of nutrition: 7 questions on food sources of nutrients such as protein, calcium, iron, vitamin C, vitamin B complex, vitamin A and iodine. Two questions to check ability to choose balanced menu and 10 questions of true-false questions regarding to the functions of nutrients. Each question scored one point

making 19 points as the highest. This score was planned to be used for correlation study between the subjects' nutrition knowledge score their dietary intake.

3) Food preference and frequency test

The subjects were asked to indicate whether they like, dislike or never tried 72 food items listed. If tried, they were asked to write down how many times they took per week or per month for the frequency test. The result of the test were analyzed by the basic four groups.

4) 24-hour dietary recall study

The 24-hour dietary recall record included time, food eaten, how prepared and the amount eaten by the subjects. The amount of foods consumed by the subjects were based on the estimation and the data used in this study should be interpreted with 20% margin of sampling error for each nutrients.²⁾ Upon the completion of the record by the students, each subject were interviewed to describe the amount eaten as precise as possible. Then it were translated into grams or ounces for calculation. The calculation for their nutrients were done by using the food tables of Watt & Merrill³⁾ and Korean food tables of FAO.⁴⁾ The mean intake of each nutrients by male and female subjects were compared with that of Korean and U.S. recommended dietary allowances.

5) Mothers' nutrition knowledge and preference test

The questionnaire to the subjects' mothers were designed to see whether there might be any relationship between mothers and the subjects' nutrition knowledge and their diet.

RESULTS and DISCUSSION

1) Biographical information

The subjects were 25 male and 32 female students, the education level of their fathers showed that there were 7 fathers who had high school education and 28 had some college education, there were 40 students who had both parents employed. Twenty two of

the 57 subjects have lived in U.S. less than one year and 31 less than five years.

The meal pattern of the subjects from biographical information part is shown in Table 1.

Table 1. Breakfast pattern of the subjects from the biographical information

	Male (N=25)	Female (N=32)
Cereal with milk	6 (30%)	9 (36%)
Doughnut or cake with milk	5 (25%)	5 (20%)
Toast, bacon, egg & juice	6 (30%)	6 (24%)
Rice & soup	2 (10%)	4 (16%)

For lunch, 38% of the male and 66% of the female subjects used school lunch. Also 44% of the male, 74% of the female liked school lunch.

For both male 96% and female 94% the largest meal of the day was dinner. Most of the subjects dined out once a month and they are more over the weekend. Twenty percent of male, 38% of female subjects took vitamin pills regularly.

Thirty nine percent of the male subjects said the most helpful changes in their diet after coming to U.S. were drinking more milk where 68% female said eating more fruits.

The result of the preference between Korean & American food are shown in Table 2.

Table 2. Percentage of the preference between Korean & American foods by the subjects

Food Items	Male (N=25)	Female (N=32)
1) Bulgogi vs. Steak	20 (80%) 5 (20%)	22 (73%) 8 (27%)
2) Kimchi vs. Salad	18 (82%) 4 (18%)	21 (68%) 9 (32%)
3) Apple vs. Apple pie	17 (71%) 7 (29%)	25 (81%) 6 (19%)
4) Tea vs. Coke	15 (75%) 5 (25%)	23 (77%) 7 (23%)

From the Table 2, the majority of the subjects liked the Korean foods better and they retained Korean food habits.

Anthropologist Margaret Mead⁵⁾ claimed that resistance to changing food habits is related to patterns of rearing children because children learn food habits from their parents until they leave home. Also she⁶⁾ mentioned that the difference in how immigrants change their eating habits is related to how well they like the food of their native lands.

The most favorite snack items for boys were corn-chips, potato chips, cookies and hamburger and for the girls were fruits, candy bars and hamburger. Thomas and Call⁷⁾ did a study on impact of snacking among adolescents on their nutritional status and found that the undesirability of eating between meals were over-emphasized since foods eaten between meals provide a substantial proportion of adolescent's daily caloric requirements.

Also 28% of males and 37% of females obtained food and nutrition information from their mothers.

2. Nutrition knowledge of the subjects

The mean score of the male students was 11.8 and 11.5 for the female among 19 points. The female scored lower on food sources of iron than male contrary to the fact that the girls have higher iron demand. Only 33% of both male and female subjects knew vitamin A food sources. Girls scored slightly higher in choosing balanced menus of both Korean and American menus.

3. Food preference and frequency test

The food items indicated as the most liked by the subjects were beef, banana, kimchi, rice, egg, tofu, strawberry and Bindaiduck. The most disliked by both sexes were liver, turkey, pork, yogurt, avocado, cottage cheese and olives, most of which are not easily available in Korea. The foods never tried were broccoli, tongue, lamb, mango and nonfat powder milk by both sexes.

From the analysis of the food frequency test according to the basic four food group, 50% of the male, 37% of the female took only 2 food groups per day. Male

subjects showed higher percentage of meeting 3 servings of milk (31%) whereas female had higher percentage of fruits and vegetables (71%) as well as bread and cereal food groups (59%).

4. Analysis of 24-hour diet recall

Of 57 subjects, 29 male and 24 females students participated to 24-hour diet recall. The result analyzed according to the basic four food groups showed that 48% of the male took 2 food groups where 67% of female took only one food group per day.

The result of the basic four food group analysis from 24-hour diet recall are shown in Table 3.

Table 3. Number & percent of the subjects meeting basic four food group requirements from 24-hour diet recall

Food Groups	Male (N=29)	Female (N=24)
3 servings of milk/day	5 (17%)	3 (12%)
2 servings of meat or meat equivalents/day	18 (62%)	11 (46%)
4 servings of fruits & vegetables	14 (48%)	13 (54%)
4 servings of bread & cereals	22 (76%)	11 (46%)

Sandstead & Person⁸⁾ mentioned that cross check methods should be devised by asking the same questions in different ways at different time to improve reliability of dietary information. Therefore the results of each parts are compared in this study.

The meal pattern analysis from the 24-hour diet recall showed 60% of female subjects skipped breakfast whereas 21% of the boys did. This also agrees with the result of the biographical information part where 40% girls, 24% boys said they never took breakfast. For lunch the subjects showed high intake of bread, milk & hamburger rather than rice and kimchi. All of the subjects had rice for dinner and few of them had milk for dinner. The most popular beverages were fruit juices which suggests that typical American adolescents snack habit of soft drink were not adopted.

Their snack pattern was diverse including items like noodle, rice and other meal items which suggested that their meal pattern was not definite 3 meals but average of 4 to 5 meals a day and ate some of the leftover meals which didn't require extra preparation.

The mean intake of each nutrients from the 24-hour diet recall are shown in Table 4.

The percentage distribution of the subjects who met Korean and U.S. RDA in each nutrient are shown in Fig. 1 & 2.

From the Fig. 1 & 2, a big difference in the percentage of the subjects met U.S. RDA of Ca & Korea were due to the big differences between two countries RDA (1.2 gm vs. 0.7 gm).

In order to find out further nutritional status of the subjects the percentage distribution of subjects who met 1-33%, 34-66%, 67-100% and above 100% by U.S. & Korean RDA for Kcal, Ca, Fe, Vit. A and Vit. C are shown in Fig. 3 & 4.

Wenkam and Wolff⁹⁾ did a study of food habits of Japanese descents living in Hawaii and found that the second generation changed their predominantly high carbohydrate rice diet to a high protein and fat

diet. Also a study of young Filipino women in Los Angeles by Glaspy¹⁰⁾ and a study of Chinese American teenagers by Wu¹¹⁾ found that mean protein intake increased drastically. However, in this study protein intake of the subject didn't increase drastically but female subjects consumed better than male. High intake of vitamin C from the 24-hour diet recall analysis agrees with the frequency test which showed orange or orange juice were the most popular snack items. Often vitamin C was a limiting nutrient among the low economic class of the American adolescents,¹²⁾ but the subjects in this study had relatively good vitamin C intake.

5. Mothers' nutrition knowledge and preference test

An attempt was made to see any correlation between the subjects' nutrition knowledge score, mothers' nutrition knowledge score and the subjects nutrient intake but the data collected available for statistical analysis were not enough to do so.

The result of the food preference test on their mothers showed very similar results with the subjects although the number of the food items never tried

Table 4. Average daily nutrient intakes of Korean adolescents in L.A. in comparison with the RDA of Korea & US

	Kcal	Protein	Ca	Fe	Vit. A	Vit. B ₁	Vit. B ₂	Niacin	Vit. C
		(gm)	(gm)	(mg)	(IU)	(mg)	(mg)	(mg)	(mg)
Male:									
Mean	1696	73	0.7	9	4029	1.1	1.5	14	134
± S.D.	±437	±25	±0.2	±3	±3238	±0.4	±0.4	±4	±132
RDA (Korea)	2900	85	0.7	18	7500	1.5	1.7	19	60
RDA (US)	3000	54	1.2	18	5000	1.5	1.8	20	45
Female:									
Mean	1620	97	0.8	11	5687	1.1	2.3	22	203
± S.D.	±475	±44	±0.5	±5	±5464	±0.4	±1.8	±12	±110
RDA (Korea)	2200	75	0.7	18	6000	1.1	1.3	15	60
RDA (US)	2100	48	1.2	18	5000	1.5	1.8	20	45

RDA (Korea) : RDA of Korea, 1975 revision of FAO of 16-19 age group

RDA (US) : RDA of U.S., revision of NAS of 15-18 age group.

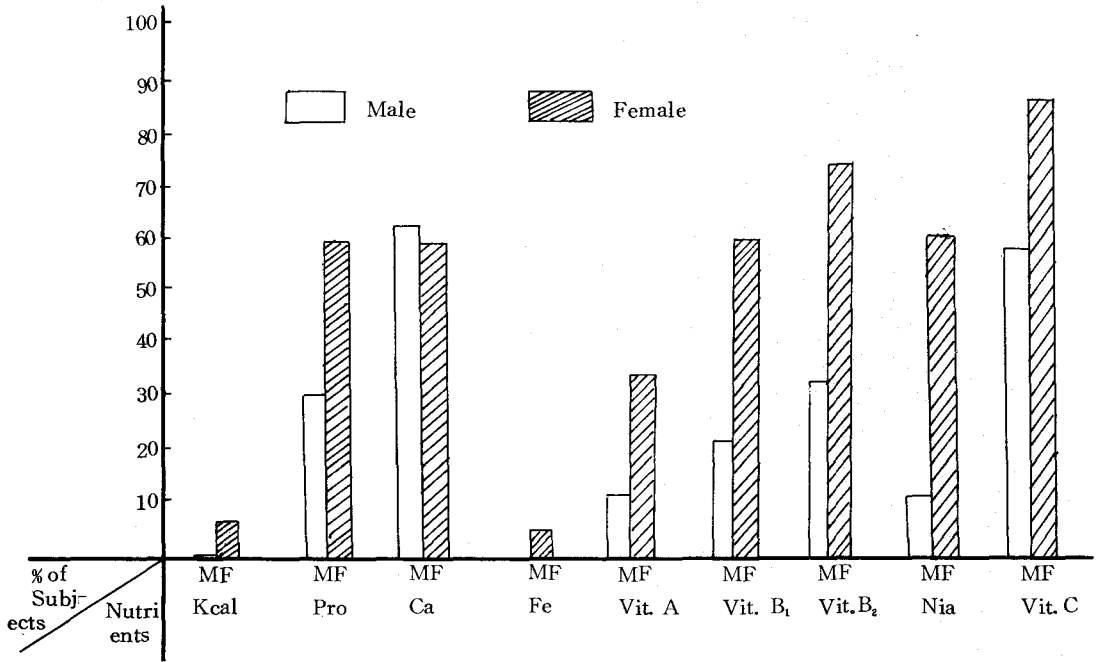


Fig. 1. The percentage distribution of subjects who met Korean RDA in each nutrient.

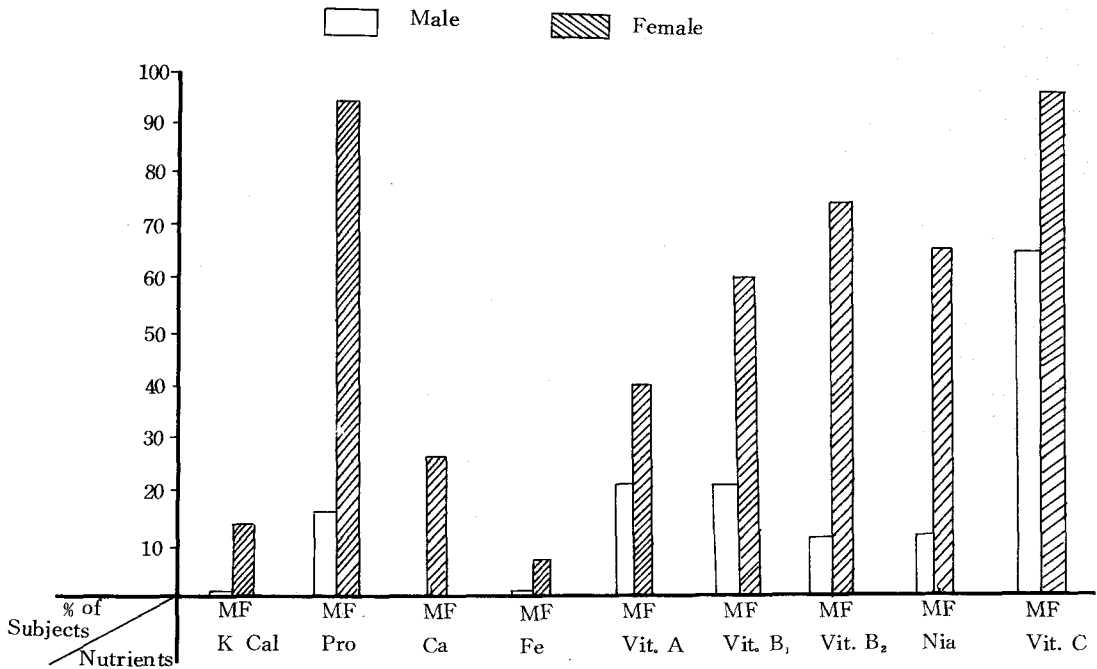


Fig. 2. The percentage distribution of subjects who met U.S. RDA in each nutrient.

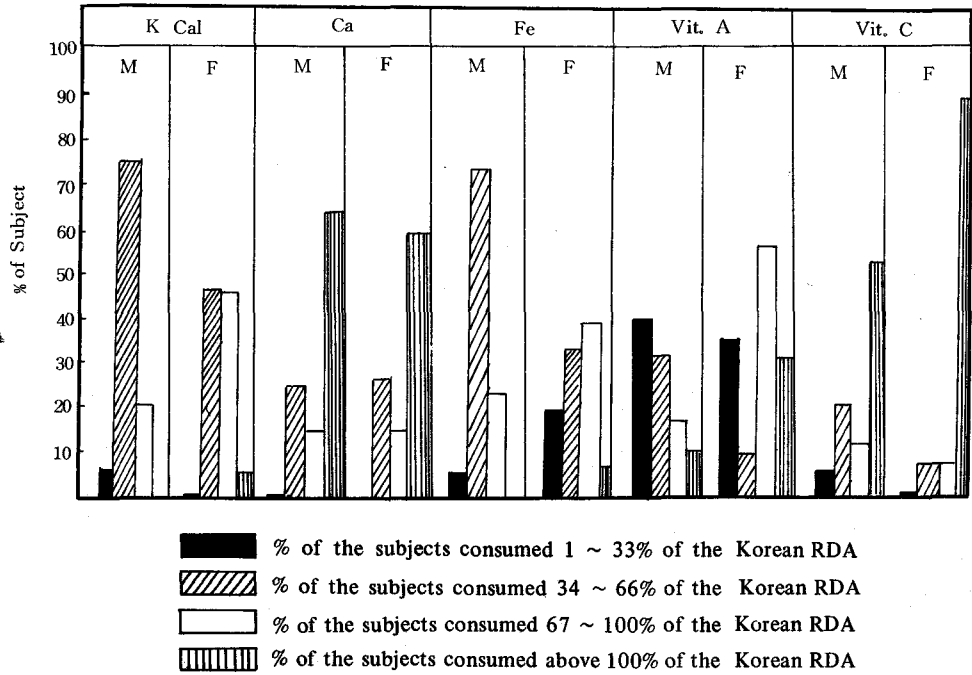


Fig. 3. Percentage distribution of the subjects who met various proportions of Korean RDA for

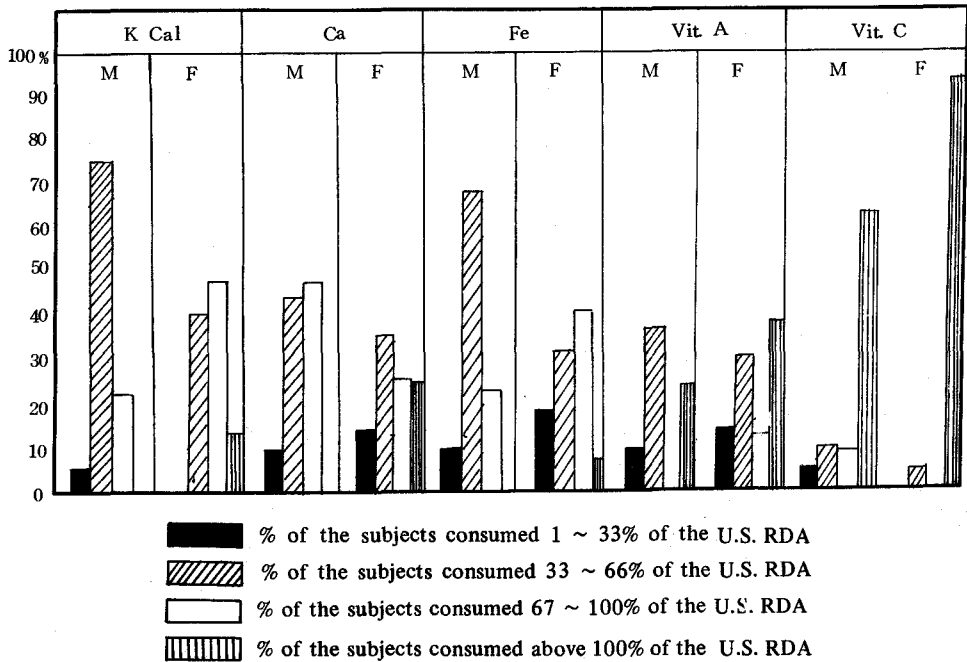


Fig. 4. Percentage distribution of the subjects who met various proportions of U.S. RDA for Kcal, Ca, Fe, Vit. A & Vit. C.

were higher than the subjects. This might be due to the reason that the subjects were exposed to the American foods through the school lunch program. This also suggests a tendency of changing food habits faster in youngsters than in older ones.

CONCLUSION

Of the 57 subjects who moved from Korea to the United States within less than five years with their family, the following points could be made:

- 1) The traditional Korean food habits were kept for dinner but American style meal patterns were adopted for breakfast and lunch.
- 2) Female subjects tended to miss breakfast more where as male subjects tended to miss regular dinner more often. This might be due to their inexperienced meal preparation ability of the male subjects who have working mothers.
- 3) The most favorite snack items were corn chip, potato chip, hamburger and orange juice.
- 4) The most influential source of food and nutrition information were their mothers.
- 5) The subjects were lacking nutrition knowledge on food sources of Fe, Vitamin A and this agreed with the result of the analysis of 24-hour diet recall as the deficient nutrients in their diet.
- 6) From the preference test, the most disliked food were liver, turkey, pork, yogurt, avocado, cottage cheese and olives which are not easily available in Korea.
- 7) From the analysis of 24-hour diet recall study, calories, Fe and vitamin A were the limiting nutrients.
- 8) The result of the food preference test for their mothers showed very similar results with their children although the study proved that a tendency of changing food habits are faster in youngsters than in older ones.

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