

A Study of Food Attitudes at the Community Level

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＝國文抄錄＝

地域集團의 食品態度에 關한 研究

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本 研究의 目的은 地域集團의 各 食品群에 對한 態度를 밝혀내고 나아가서는 營養改善事業의 評價와 아울러 特定 食品의 攝取量의 差異에서 起因하는 營養問題의 適切한 解決方案을 模索키 위한 基礎情報를 提供키 爲함이다. 이는 1973년 8월 保健社會部가 서울特別市外 3個道에서 層別多段抽出法에 依하여 抽出한 30地域, 600家口을 對象으로 實施한 國民營養調查中 8個地域을 選定하여 그 中, 食品攝取狀態調查資料에 그 根據를 두고 있다.

各 食品群에 對한 全對象地域의 態度는 다음과 같다(괄호안은 親知性 指數).

- | | |
|-----------------|--------------------|
| 1. 醬油類 (-1.20) | 9. 麥類 (-0.07) |
| 2. 油脂類 (-1.12) | 10. 薯類 (-0.06) |
| 3. 豆類 (-0.06) | 11. 鮮魚介類 (0.44) |
| 4. 貯藏野菜 (-0.45) | 12. 貯藏魚介類 (0.56) |
| 5. 海藻類 (-0.32) | 13. 卵類 (1.06) |
| 6. 砂糖類 (-0.19) | 14. 果實類 (1.26) |
| 7. 新鮮野菜 (-0.15) | 15. 獸鳥肉類 (1.33) |
| 8. 米類 (-0.13) | 16. 乳 및 乳製品 (2.87) |

또한, 地域集團의 食品 親和度는 食品群에 따라 매우 有意한 差異가 있으나, 地域間 差異는 보이지 않으며, 米類, 麥類, 豆類, 薯類, 貯藏野菜, 果實類, 砂糖類, 海藻類, 獸鳥肉類, 卵類, 鮮魚介類 및 油脂類의 攝取量은 地域集團間에 매우 有意한 差異가 있었으나 新鮮野菜, 貯藏魚介類, 乳 및 乳製品의 境遇에는 地域集團에 따른 差異가 나타나지 않았다.

I. INTRODUCTION

Food attitudes at the community level appear to be different than at the individual level. The assessment of food attitudes at the community level, though it has been attempted in several questionnaire surveys¹⁻⁴, has some drawbacks in its quantification. There is at present no definite way of evaluating or quantifying food attitudes at the community level

using food intake as the variable. However, an attempt is made in this study to analyze and evaluate it quantitatively in terms of an acceptability index computed from the mean intake and its coefficient of variance for each food item⁵.

The attitudes of the community towards certain foods stuffs should be described on the basis of two different notions of the community, i.e., 1) mean or integration of individual palatability and 2) particular food stuffs pe-

cular to the community group⁵. In the field of public health, surveying the attitudes of the community group towards certain food stuffs should be done on the group concept⁵.

Dietary life that is quantifiable may be used in order to analyze the attitude towards food stuffs⁶. Using the mean intake of each food item and its coefficient of variance, two dimensions of the food intake pattern can be presented, i.e., the regression curve of coeffi-

cient of variance(Y) on mean intake(X) which is the standard curve showing the food intake pattern of the community.

The aims of this study are, 1) to describe the attitudes of the community towards each food item, and 2) to provide the information necessary for the solution of nutritional problems due to the different food intake of the community.

Table 1. Evaluation of Food Attitudes by Acceptability Index

Stage of Acceptability	Palatability (Individual Level)	Acceptability Index	Acceptability (Community Level)
0	Dislike Vely Much	$A.I. > 2.5$	Nodal Very Much
1	Dislike Moderately	$2.5 \geq A.I. > 1.5$	Nodal Moderately
2	Dislike Slightly	$1.5 \geq A.I. > 0.5$	Nodal Slightly
3	Neither Dislike nor Like	$0.5 \geq A.I. > -0.5$	Neither Nodal nor Uniform
4	Like Slightly	$-0.5 > A.I. \geq -1.5$	Uniform Slightly
5	Like Moderately	$-1.5 > A.I. \geq -2.5$	Uniform Moderately
6	Like Very Much	$-2.5 > A.I.$	Uniform Very Much

II. MATERIALS AND METHODS

This study is based on the Food Consumption Survey^{8,9} conducted by the Ministry of Health and Social Affairs in a series of National Nutrition Survey in August, 1973. The sample included 4 provinces, of which 30 com-

munities were selected by the stratified multi-stage sampling methods. Among these, 8 communities were sampled at random for this study.

The procedures to devise an acceptability index are as follows.

1. Each food item is plotted on a semi-logarithmic graph, in which the regional mean

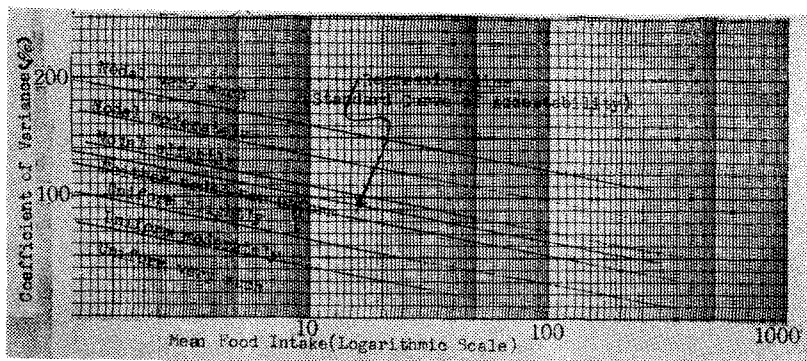


Figure 1. Division of acceptability by food intake pattern

intake of each food item is presented as the X-distance (common logarithmic scale), and the coefficient of variance is presented as the Y-distance. Then, the standard deviation and the coefficient of variance are computed.

2. The regression line of the coefficient of variance on the logarithms of the mean intake is computed by the least square method.

3. The residuals from regression, and the standard deviation from regression (or standard error of estimate) are computed.

4. The acceptability index is computed by means of dividing residuals from regression by the standard deviation from regression, both computed as explained above.

5. Each category is plotted with a width of the standard deviation from regression showing the stage of acceptability, using the regression

equation and the standard deviation from regression; both computed as explained above.

6. The food attitude of the community is then evaluated in terms of the acceptability index (Table 1).

Illustrations of the procedures described above are presented in Table 2 and Figure 2.

III. RESULTS

Food attitudes of the sample communities were determined by means of the mean acceptability index computed. (Table 3)

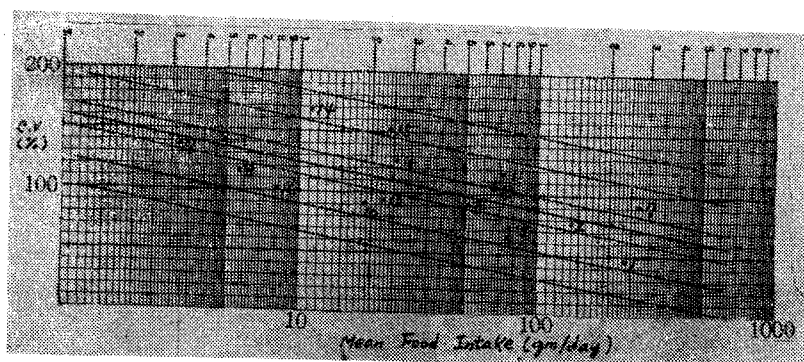
The order of the food items in the following list is indicative of the relative strength of acceptability of the food items in the sample communities.

1. Seasonings (-1.20)
2. Oils and fats (-1.12)
3. Pulses (-.60)
4. Processed vegetables (-.45)
5. Seaweeds (-.32)
6. Sugars (-.19)
7. Fresh vegetables (-.15)
8. Rice (-.13)
9. Cereals and grain products (-.07)
10. Starchy roots (-.06)
11. Fresh fish and shells (.44)
12. Processed fish and shells (.56)
13. Eggs (1.06)
14. Fruits (1.26)
15. Meats and poultry (1.33)
16. Milk and milk products (2.87)

The analysis-of-variance summary for the acceptability index, which is presented in Table 4, shows that there is a highly significant difference of acceptability between food items. The analysis-of-variance summary presented in Table 6 shows that there is a real difference of mean intake of rice, cereals and grain

Table 2. Evaluation of Food Attitudes by Acceptability Index (Yonhee Dong, Seoul)

Food Item	x_i	y_i	\hat{y}_i	$y_i - \hat{y}_i$	$(y_i - \hat{y}_i)/s$
Rice	236.4	40.6	70.6	-30.0	-1.31
Cereals and Grain Products	143.6	70.7	78.7	-8.0	-0.35
Pulses	52.4	85.3	95.1	-9.8	-0.43
Starchy Roots	25.9	127.0	106.5	20.5	0.90
Vegetables, Fresh	80.5	74.5	88.1	-13.6	-0.60
Vegetables, Processed	75.9	74.4	89.1	-14.7	-0.64
Fruits	271.7	88.3	68.4	19.9	0.87
Sugars	5.8	113.0	130.8	-17.8	-0.78
Seaweeds	3.2	131.2	140.5	-9.3	-0.41
Seasonings	18.1	91.7	112.3	-20.6	0.90
Meats and Poultry	71.6	116.6	90.0	26.6	1.16
Eggs	22.2	92.8	109.1	-16.3	-0.71
Fish and Shells, Fresh	68.3	101.6	90.8	10.8	0.47
Fish and Shells, Processed	11.2	167.0	120.2	46.8	2.05
Milk and Milk Products	23.8	147.5	108.3	39.2	1.72
Oils and Fats	8.1	101.2	125.4	-39.3	-1.06



1. Rice
2. Cereals and Grain Products
3. Pulses
4. Starchy Roots
5. Vegetables, Fresh
6. Vegetables, Processed
7. Fruits
8. Sugars
9. Seaweeds
10. Seasonings
11. Meats and Poultry
12. Eggs
13. Fish and Shells, Fresh
14. Fish and Shells, Processed
15. Milk and Milk Products
16. Oils and Fats

Figure 2. Division of acceptability by food intake pattern(Yonhee Dong, Seoul)
 Standard Curve of Acceptability: $Y=159.41-37.41 \text{ Log } X$
 Correlation Coefficient: $r= -.66(p<.01)$

Table 3. Analysis-of-Variance Summary for Acceptability Index

Due to	SS	df	MS	F ratio
Food Items	127.96	15	8.53	10.66**
Communities	4.65	7	.66	.82
Errors	84.50	105	.80	
Total	217.11	127		

**p<.01

products, pulses, starchy roots, processed vegetables, fruits, sugars, seaweeds, meats and poultry, eggs, fresh fish and shells, and oils and fats between the communities at the .01 level of significance. However, the mean intake of fresh vegetables, processed fish and shells, and milk and milk products shows no difference between the communities. The acceptability index of starchy roots and seaweeds in the rural areas is higher than that in urban areas, as well as the daily mean intake. The acceptability of fresh vegetables, fruits, sugars, meats and

poultry, eggs, fresh fish and shells, and milk and milk products in Seoul is higher than that in rural areas, as well as the daily mean intake. There is a striking difference in the daily intake and acceptability index of eggs.

The acceptability index of pulses, processed fish and shells, and oils and fats in the rural areas is higher than that in Seoul, but not the daily intake of these items. Also, the acceptability of rice, cereals and grain products, seasonings, and processed vegetables in the rural areas is higher than that in Seoul, but not the daily intake.

IV. DISCUSSION AND CONCLUSIONS

In relation to food attitude, it is possible to analyze and evaluate it in terms of food consumption at the individual level⁶. Generally, palatability is defined at the individual level as a hedonic response of an individual to a

Table 4. Evaluation of Food Attitudes by Acceptability Index

Food Item	Yonhee Dong	Angug Dong	Daebang 2 Dong	Woojong Myon	Kangoe Myon	Keumwang Myon	Anmyon Myon	Sayang Myon	Mean
Rice	-1.31	-.64	.56	-.21	.11	.07	.35	.03	-.13
Cereals and Grain Products	-.35	-.73	.06	-.42	.07	.36	.46	.03	-.07
Pulses	-.43	.02	-.68	-.09	-1.14	-1.16	-.51	-.78	-.60
Starchy Roots	.90	-.35	.11	-.26	-.10	-.59	-.12	-.19	-.60
Vegetables, Fresh	-.60	-.74	.58	.52	-.45	-.23	-.06	-.23	-.15
Vegetables, Processed	-.64	-.61	-.19	-.65	-.98	-.37	-.05	.08	-.45
Fruits	.87	.89	1.07	1.39	2.17	2.14	.74	.78	1.26
Sugars	-.78	-.52	.39	.14	.53	-.63	-.84	.16	-.19
Seaweeds	-.41	.52	-.67	-.25	-1.01	-.39	-.05	-.29	-.32
Seasonings	-.90	-1.36	-2.28	-1.33	-1.08	-.74	-.88	-1.01	-1.20
Meats and Poultry	1.16	1.08	-.37	2.80	1.32	1.01	.73	2.93	1.33
Eggs	-.71	.07	-.54	5.78	-.59	.03	3.25	1.21	1.06
Fish and Shells, Fresh	.47	.29	.05	-.43	.99	1.65	.47	.07	.44
Fish and Shells, Processed	2.05	1.40	-.47	-.14	.91	.79	1.27	-1.33	.56
Milk and Milk Products	1.72	2.26	2.68	3.58	5.64	3.02	.06	4.00	2.87
Oils and Fats	-1.06	-1.57	-.26	-1.06	-1.21	-1.72	-1.20	-.89	-1.12
Correlation Coefficient	-.66**	-.60*	-.83*	-.58*	-.71**	-.76**	-.80**	-.77**	-.71**

**p < .01

*p < .05

food stuff depending on its taste, smell, flavor, feel, texture, appearance and related conditions¹⁰.

Very seldom does a person eat all the potentially edible materials available to him or her. More often his or her cultural pattern, learned from the parents and associates by subconscious observation and by explicit instruction, classifies various items as appropriate or inappropriate food¹¹. Dietary patterns are affected by standard of living, income, housing, difficulties of transportation, storage and preservation of food¹². In genal, local food production patterns and agricultural factors have a dominating influence on food availability and consumption¹². A consideration of food attitudes must include methods of food preparation and meal patterns.

Evaluating the status of the dietary pattern

of a community merely in terms of mean intake is likely to result in distorted findings.

In particular, the effect of nutrition education projects cannot be appraised only by intake increment. Rather, it largely depends on whether the acceptability has increased or not. In other word, its effect will be offset by its decreased acceptability in spite of the increased mean intake⁵.

Palatability to food stuffs is numerated though the combination of the regression curve and its standard error which is calculated by the least square estimator on the food pattern analyzing figure⁵.

Hence, the selection of the proper evaluation measure to improve nutrition education projects is closely related with the acceptability of food items.

The results of this study can be compared

Table 5. Mean Intake of Each Food Item

Food Item	Yonhee Dong	Angung Dong	Daebang 2 Dong	Woojong Myon	Kan oe Myon	Keumwang Myon	Anmyon Myon	Sayang Myon	Mean
Rice	236.4	222.0	287.3	182.4	193.5	354.5	247.9	194.1	239.8
Cereals and Grain Products	143.6	134.3	95.2	285.9	580.2	316.4	241.3	366.4	270.4
Pulses	52.4	46.6	17.6	11.8	16.0	7.7	3.4	14.8	21.3
Starchy Roots	25.9	45.1	16.4	73.7	53.9	24.2	51.9	59.8	43.9
Vegetables, Fresh	80.5	130.0	140.6	99.1	121.1	102.9	119.2	105.0	112.3
Vegetables, Processed	75.9	78.2	107.6	74.7	100.1	104.1	135.0	138.7	101.8
Fruits	271.7	107.9	85.6	63.1	7.4	16.8	88.4	51.3	85.6
Sugars	5.8	2.9	1.8	.8	.2	0.6	1.7	1.0	1.8
Seaweeds	3.2	3.6	2.6	.9	.3	2.6	6.1	2.6	2.8
Seasonings	18.1	13.7	18.0	11.2	28.4	13.8	29.8	30.1	21.0
Meats and Poultry	71.6	28.6	13.8	.8	12.5	2.1	5.9	6.8	142.1
Eg	22.2	14.9	6.7	1.0	.9	.8	0.3	.3	5.9
Fish and Shells, Fresh	68.3	14.4	30.8	21.4	8.7	.8	41.7	8.0	24.3
Fish and Shells, Processed	11.2	25.6	10.2	14.1	26.1	19.2	2.7	3.4	14.1
Milk and Milk Products	23.8	16.0	1.3	.1	.1	.1	.5	.1	5.2
Oils and Fats	8.1	5.1	3.9	1.1	1.6	2.5	.6	1.8	3.8

with that of Toyokawa⁵, as follows:

1. Rice (-1.10)
2. Seasonings (-1.06)
3. Fats and oils (-.74)
4. Eggs (-.68)
5. Sugars (-.64)
6. Fish and shells (-.51)
7. Fresh vegetables (-.31)
8. Starchy roots (.17)
9. Processed vegetables (.28)
10. Meats and poultry (.44)
11. Pulses (.67)
12. Cereals and grain products (.77)
13. Fruits (.81)
14. Milk and milk products (2.83)

This study, which found a markedly low acceptability for milk and milk products, meats and poultry, and eggs, validates again the insufficient intake of animal protein among Koreans disclosed in several past surveys.¹³⁻¹⁶

It must be mentioned, with regret, that the interaction of many factors affecting dietary patterns, characteristics peculiar to the com-

munity and the acceptability index needs further study. Thus far, there are few studies available which can be compared with this one.

V. SUMMARY

The aims of this study are, 1) to describe the attitudes of the community towards each food item and 2) to provide the information necessary for the solution of nutritional problems due to the different food intake of the community.

This study is based on the Food Consumption Survey conducted by the Ministry of Health and Social Affairs in a series of National Nutrition Survey in August, 1973. The sample included 8 communities, in which 160 households were selected at random for this study.

The procedures and methods used in this study to compute the acceptability index were adopted from the study of H. Toyokawa, University of Tokyo.

Table 6. Analysis-of-Variance for Mean Intake

Food Item	Due to	SS	df	MS	F ratio
Rice	C	667,340	7	95,334	6.86**
	E	2111,689	152	13,892	
Cereals and Grain Products	C	3,471,417	7	495,961	30.01**
	E	2,511,136	152	16,521	
Pulses	C	45,740	7	6,354	9.46**
	E	105,007	152	691	
Starchy Roots	C	55,578	7	7,940	3.60**
	E	332,542	152	2,188	
Vegetables, Fresh	C	50,720	7	7,246	.60
	E	1,652,453	152	10,871	
Vegetables, Processed	C	170,649	7	24,378	6.23**
	E	594,430	152	3,911	
Fruits	C	974,982	7	139,283	9.08**
	E	2,330,124	152	15,330	
Sugars	C	477	7	68	4.80**
	E	2,162	152	14	
Seaweeds	C	297	7	42	.98
	E	6,561	152	43	
Seasoning	C	7,771	7	1,110	5.35**
	E	31,527	152	207	
Meats and Poultry	C	77,135	7	1,1019	7.21**
	E	232,150	152	1,527	
Eggs	C	9,939	7	1,420	12.68**
	E	16,998	152	112	
Fish and Shells, Fresh	C	68,976	7	8,954	8.00**
	E	170,007	152	1,118	
Fish and Shells, Processed	C	11,917	7	1,702	1.49
	E	173,651	152	1,142	
Milk and Milk Products	C	4,487	7	641	.51
	E	191,650	152	1,261	
Oils and Fats	C	873	7	125	6.25**
	E	3,090	152	20	

**p < .01

C: Communities

E: Errors

Food attitudes of the sample communities are clear in terms of the mean acceptability index which is presented in Table 3. The following order is indicative of the relative strength of acceptability of the respective food items:

1. Seasonings (-1.20)
2. Oils and Fats (-1.12)

3. Pulses (-.60)
4. Processed vegetables (-.45)
5. Seaweeds (-.32)
6. Sugars (-.19)
7. Fresh vegetables (-.15)
8. Rice (-.13)
9. Cereals and grain products (-.07)
10. Starchy roots (-.06)
11. Fresh fish and shells (.44)
12. Processed fish and shells (.56)
13. Eggs (1.06)
14. Fruits (1.26)
15. Meats and poultry (1.33)
16. Milk and milk products (2.87)

There are highly significant difference in the acceptability index between food items and the mean intake of rice, cereals and grain products, pulses, starchy roots, processed vegetables, fruits, sugars, seaweeds, seasonings, meats and poultry, eggs, fresh and shells, and oils and fats between the communities at the .01 level of significance.

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