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☐ **Original Article** ☐

Housewives' Behavior of Purchasing Special Eggs and Cooking Patterns of Eggs in Kyunggi-do and Inchon*

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ABSTRACT

The purpose of this study was to investigate the purchase of special eggs and cooking patterns of eggs. This survey was carried out through questionnaire and the subjects were 435 housewives whose children were middle or high school students in Kyunggi-do and Inchon.

The results are summarized as follows :

1) As for age, 66.4% of subjects were 40 years or older. Also 57.1% of subjects received a high school education, As for occupation, full-time housewives accounted for 60.5%. Monthly family income of 39.1% was 1 - 2 million won. As for monthly cost of food, 51.7% of subjects paid less than 500 thousand won. Also 40.2% of subjects lived in apartments.

2) Most housewives knew about the sale of special eggs. However, they perceived that the price of special eggs was expensive.

3) The higher their age, education level, household income and food cost were, the more frequent their purchase of special eggs was.

4) The reason for their purchasing special eggs was in order of nutrition and freshness.

5) Most housewives didn't trust the brands of special eggs.

6) The most popular method of cooking eggs was fried-eggs.

Therefore, it is necessary to provide cheap, fresh and nutritious special eggs. (*Korean J Community Nutrition* 2(5) : 711~720, 1997)

KEY WORDS : special eggs · consumer · purchasing behavior · cooking patterns.

Introduction

Due to modern economic development and changes in people's living habits, with more married women working, eating-out and quickly-prepared meals have increased(Robusts & Wortzel 1979 ; Schaninger & Allen 1981). Recently many people have more interest in their health as the economic situation improves, but their bodies get weaker from nutritionally-unbalanced diets and fatter by increased intake of meat, alcohol and fat(Lee 1993). To maintain health, the body requires a nutritionally-balanced diet including essential amino acids, minerals and vitamins along with good eating habits(Shils et al. 1994).

Eggs are an important part of the human diet in most countries, because they are cheap, nutritious and easy to cook(Chang 1994). As a human food,

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the egg contains all of the nutrients with the exception of vitamin C(Macrae et al. 1993). The amino acid balance of egg protein is almost perfect to meet human requirements(Wardlaw & Insel 1996). Also the egg is an excellent source of many of the trace minerals and vitamins(Chang 1994). The average proximate chemical composition of the edible portion of a whole egg is as follows : water 75.0%, protein 13.0%, lipid 11.3%, carbohydrate 0.8% and ash 0.9%(Macrae et al. 1993).

The composition of an egg varies depending on the strain of the hen, age of the hen, diet of the hen, and breeding conditions such as temperature(Ahn et al. 1995 ; Cabos et al. 1995 ; Cahu et al. 1995 ; Nemecz & Mennear 1995 ; Stadelman & Pratt 1989 ; Zaky et al. 1996). Recently more than 30 kinds of special eggs are commercially available ; vitamin-enriched eggs, iodine-enriched eggs, ginseng eggs, ω3-fatty acids-enriched eggs, mineral-enriched eggs and so on.

Because of disorder concerning labels and marketing of special eggs, consumers are confused. In order to increase the price, sellers label the normal eggs as special eggs. Except for the special egg tag, there is no information on exact nutrient composition. Since there are no established criteria for using the special egg tag, sellers use the special egg tag too much, stimulating consumer's desire(Korean Consumer Protection Board 1995).

Therefore, this study aims at helping consumers to purchase cheap, fresh and nutritious special eggs. This study is based on a survey regarding housewives' behavior of purchasing special eggs and cooking patterns of eggs in Kyunggi-do and Inchon.

Subjects and Methods

1. Subjects and periods

The subjects were 435 housewives whose children were middle or high school students in Kyunggi-do and Inchon. This survey was carried out through questionnaires from July 15 of 1996 to July 31 of 1996. For statistical analysis, 429 well-completed questionnaires were used.

2. Questionnaire

The originally designed questionnaire was pretested and modified according to the results of the pilot study. The questionnaire sought information about the general characteristics of the subjects ; their perception of special eggs in terms of sale, kind, and price ; experience of purchasing special eggs ; reason for purchase of special eggs ; comsumer's trust in brands of special eggs ; and cooking patterns of eggs in terms of cooking method and serving mealtime.

3. Statistical analysis

The statistical analysis was conducted using SAS program for PC(Chang et al. 1993). Frequency counts (%), mean and standard deviation were calculated for all variables and the Chi-square test was used to determine statistical significance. An independence test was used for the contengency table.

Results and Discussion

1. General characteristics of subjects

Table 1 presents general characteristics of the subjects. It was shown that 33.6% of subjects were younger than 40 years and 66.4% of subjects were 40 years or older. Also, 57.1% of subjects received a high school education, 28.2% of subjects received a middle school education, 7.8% of subjects received a primary school education, and 7.8% of subjects graduated from college or higher. As for occupation, full-time housewives accounted for 60.5%, full-time employment 32.8% and part-time employment 6.8%. Monthly family income was as follows ; less than 1 million won 23.1%, 1 - 2 million won 39.4%, 2 - 3 million won 24.6%, and 3 million won or more 13.5%. As for monthly food expenses, 51.7% of subjects paid less than 500 thousand won, 40.6% of subjects paid 500 thousand - 1.2 million won, 7.7% of subjects paid 1.2 million won or more. Also 40.2% of subjects lived in apartments, 26.1% of subjects lived in single family houses, 24.1% of subjects lived in multistory houses and 9.5% of subjects lived in multifamily houses.

2. Perception of special eggs

1) Sale of special eggs

Table 2 shows that most housewives knew about the availability of special eggs(71.0% or more). There was no significant difference in perception of special eggs among the groups divided by age, education level and food expenses. However, the housewives in families of higher household income knew significantly more about the availability of special eggs($p=0.0116$).

Table 1. General characteristics of subjects

Characteristics	Groups	N(%)
Age(years)	Younger than 40(20 - 39)	144(33.6)
	40 or older(40 - 59)	285(66.4)
Education level	Elementary school	33(7.8)
	Middle school	118(28.2)
	High school	241(57.1)
	College or higher	30(7.1)
Occupation	Full-time housewife	242(60.5)
	Part-time employment	27(6.8)
	Full-time employment	131(32.8)
Household income (10,000 won/month)	Less than 100	99(23.1)
	100 - 200	169(39.4)
	200 - 300	103(24.6)
	300 or more	58(13.5)
Food expenses (10,000 won/month)	Less than 50	222(51.7)
	50 - 120	174(40.6)
	120 or more	33(7.7)
Residence type	Apartment	170(40.2)
	Singlefamily house	111(26.2)
	Multistory house	102(24.1)
	Multifamily house	40(9.5)

2) Kinds of special eggs

The perception of kind of special eggs is shown in Table 3. There was no significant difference in perception of kind of special eggs among the groups divided by age, education level, household income and food expenses. Although more than 30 kinds of special eggs were commercially available, most housewives knew about 1 - 5 kinds of special eggs(more than 84.4%). This result may be due to sale of special eggs in the market place with the limit of 5 kinds or to the fact that housewives are not much interested in the kind of special eggs.

3) Price of special eggs

Table 4 represents the perception of price of special eggs. Most housewives perceived that the price of special eggs was expensive(more than 79.7%). Only 0.5% of subjects perceived that the price of special eggs was reasonable. There was no significant

Table 2. Housewives' perception of the sale of special eggs

N(%)

Variables	Groups	Know well	Only heard	Don't know	Total	P value
Age(years)	Younger than 40(20~39)	101(70.6)	30(21.0)	12(8.4)	143(33.5)	$\chi^2=0.54^{NS}$
	40 or Older(40~59)	202(71.1)	60(21.1)	22(7.7)	284(66.5)	$p=0.9734$
	Total	303(71.0)	90(21.1)	34(8.0)	427(100.0)	
Education level	Elementary school	21(63.6)	8(24.2)	4(12.1)	33(7.9)	$\chi^2=9.25^{NS}$
	Middle school	73(62.4)	33(28.2)	11(9.4)	117(27.9)	$p=0.1599$
	High school	183(76.3)	41(17.1)	16(6.7)	240(57.1)	
	College or higher	23(76.7)	5(16.7)	2(6.7)	30(7.1)	
	Total	300(71.4)	87(20.7)	33(7.9)	420(100.0)	
Household income (10,000won/month)	Less than 100	68(68.7)	18(18.2)	3(13.1)	99(23.2)	$\chi^2=16.43^*$
	100 - 200	107(64.1)	44(26.3)	16(9.6)	167(39.1)	$p=0.0116$
	200 - 300	85(82.5)	16(15.5)	2(1.9)	103(24.1)	
	300 or more	43(74.1)	12(20.7)	3(5.2)	58(13.6)	
	Total	303(71.0)	90(21.1)	34(8.0)	427(100.0)	
Food expenses (10,000won/month)	Less than 50	153(69.2)	47(21.3)	21(9.5)	221(51.8)	$\chi^2=2.40^{NS}$
	50 - 120	124(71.7)	37(21.4)	12(6.9)	173(40.5)	$p=0.6575$
	120 or more	26(78.8)	6(18.2)	1(3.0)	33(7.7)	
	Total	303(71.0)	90(21.1)	34(8.0)	427(100.0)	

N.S : Not Significant *$p<0.05$

difference in perception of the price of special eggs among the groups divided by age, education level, or household income. However, 26.9% and 72.5% of subjects who paid 500 thousand – 1.2 million won for food per month perceived that the price of special eggs was reasonable and expensive, respectively, which showed a significant difference compared to other subjects who paid less than 500 thousand or more than 1.

Table 3. Housewives' perception of the kinds of special eggs N(%)

Variables	Groups	1 – 5 kinds	6 – 10 kinds	11 – 15 kinds	16 kinds or more	Total	P value
Age(years)	Younger than 40 (20 – 39)	119(85.0)	19(13.6)	2(1.4)	–	140(33.7)	$\chi^2=0.59^{NS}$ p=0.8978
	40 or Older(40 – 59)	233(84.4)	37(13.4)	5(1.8)	1(0.4)	276(66.3)	
	Total	352(84.6)	56(13.5)	7(1.0)	1(0.2)	416(100.0)	
Education level	Elementary school	31(96.9)	–	(3.1)	–	32(7.8)	$\chi^2=7.48^{NS}$ p=0.5869
	Middle school	93(83.8)	17(15.3)	(0.9)	–	111(27.1)	
	High school	197(83.1)	5(14.8)	(1.7)	1(0.4)	237(57.9)	
	College or higher	24(82.8)	(13.8)	(3.4)	–	29(7.1)	
	Total	345(84.4)	56(13.7)	7(1.7)	1(0.2)	409(100.0)	
Household income (10,000won/ month)	Less than 100	84(87.5)	9(9.4)	2(2.1)	1(1.0)	96(23.1)	$\chi^2=10.74^{NS}$ p=0.2937
	100 – 200	141(87.6)	19(11.8)	1(0.6)	–	161(38.7)	
	200 – 300	79(77.5)	20(19.6)	3(2.9)	–	102(24.5)	
	300 or more	48(84.2)	8(14.0)	1(1.8)	–	57(13.7)	
	Total	352(84.6)	56(13.5)	7(1.7)	1(0.2)	416(100.0)	
Food expenses (10,000won/ month)	Less than 50	184(85.6)	25(11.6)	5(2.3)	1(0.5)	215(51.7)	$\chi^2=3.65^{NS}$ p=0.7228
	50 – 120	141(83.9)	25(14.9)	2(1.2)	–	168(40.4)	
	120 or more	27(81.8)	6(18.2)	–	–	33(7.9)	
	Total	352(84.6)	56(13.5)	7(1.7)	1(0.2)	416(100.0)	

N.S : Not Significant

Table 4. Housewives' perception of the price of special eggs N(%)

Variables	Groups	Expensive	Reasonable	Cheap	Total	P value
Age(years)	Younger than 40(20 – 39)	112(84.2)	20(15.0)	1(0.8)	133(33.5)	$\chi^2=2.62^{NS}$ p=0.2692
	0 or Older(40 – 59)	206(78.0)	57(21.6)	1(0.4)	264(66.5)	
	Total	318(80.1)	77(19.4)	2(0.5)	397(100.0)	
Education level	Elementary school	22(75.9)	7(24.1)	–	29(7.4)	$\chi^2=7.76^{NS}$ p=0.2557
	Middle school	86(78.9)	22(20.2)	1(0.9)	109(27.9)	
	High school	183(81.3)	42(18.7)	–	225(57.7)	
	College or higher	20(74.1)	6(22.2)	1(3.7)	27(6.9)	
	Total	311(79.7)	77(19.7)	2(0.5)	390(100.0)	
Household income (10,000won/ month)	Less than 100	74(80.4)	18(19.6)	–	92(23.2)	$\chi^2=3.10^{NS}$ p=0.7962
	100 – 200	124(80.5)	29(18.8)	1(0.6)	154(38.8)	
	200 – 300	77(79.4)	20(20.6)	–	97(24.4)	
	300 or more	43(79.6)	10(18.5)	1(1.9)	54(13.6)	
	Total	318(80.1)	77(19.4)	2(0.5)	397(100.0)	
Food expenses (10,000won/ month)	Less than 50	176(85.4)	30(14.6)	–	206(51.9)	$\chi^2=15.35^{**}$ p=0.0040
	50 – 120	116(72.5)	43(26.9)	1(0.6)	160(40.3)	
	120 or more	26(83.9)	4(12.9)	1(3.2)	31(7.8)	
	Total	318(80.1)	77(19.4)	2(0.5)	397(100.0)	

N.S : Not Significant **$p<0.01$

2 million won for food per month(p=0.004).

3. Experience of purchasing special eggs

In Table 5, 52.5% of housewives whose age was 40 years or older have purchased special eggs 1 – 10 times, 31.3% of these housewives never have purchased special eggs, 11.0% of these housewives have

Table 5. Experience of housewives' purchasing special eggs N(%)

Variables	Groups	None	1 – 10 times	11 – 20 times	21 times or more	Total	P value
Age(years)	Younger than 40 (20 – 39)	46(33.1)	75(54.0)	13(9.4)	5(3.6)	139(33.1)	χ^2=7.96* p=0.040
	40 or Older(40 – 59)	88(31.3)	146(52.0)	16(5.7)	31(11.0)	281(66.9)	
	Total	134(31.9)	221(52.6)	29(6.9)	36(8.6)	420(100.0)	
Education level	Elementary school	16(50.0)	14(43.8)	–	2(6.3)	32(7.7)	χ^2=18.95* p=0.020
	Middle school	44(38.6)	56(49.1)	8(7.0)	6(5.3)	114(27.5)	
	High school	66(27.6)	134(56.1)	17(7.1)	22(9.2)	239(57.7)	
	College or higher	5(17.2)	15(51.7)	3(10.3)	6(20.7)	29(7.0)	
	Total	131(31.6)	219(52.9)	28(6.8)	36(8.7)	414(100.0)	
Household income (10,000won/ month)	Less than 100	37(37.8)	51(52.0)	3(3.1)	7(7.1)	98(23.3)	χ^2=29.94*** p=0.0004
	100 – 200	60(36.8)	84(51.5)	12(7.4)	7(4.3)	163(38.8)	
	200 – 300	19(18.8)	60(59.4)	12(11.9)	10(9.9)	101(24.0)	
	300 or more	18(31.0)	26(44.8)	2(3.4)	12(20.7)	58(13.8)	
	Total	134(31.9)	221(52.6)	29(6.9)	36(8.6)	420(100.0)	
Food expenses (10,000won/ month)	Less than 50	80(37.0)	112(51.9)	14(6.5)	10(4.6)	216(51.4)	χ^2=13.79* p=0.030
	50 – 120	47(27.5)	92(53.8)	12(7.0)	20(11.7)	171(40.7)	
	120 or more	7(21.2)	17(51.5)	3(9.1)	6(18.2)	33(7.9)	
	Total	134(31.9)	221(52.6)	29(6.9)	36(8.6)	420(100.0)	

*p<0.05 ***p<0.001

Table 6. Reason for housewives' purchasing special eggs N(%)

Variables	Groups	Nutrition	Freshness	Trust	Price	Total	P value
Age(years)	Younger than 40 (20 – 39)	44(40.4)	45(41.3)	11(10.1)	9(8.3)	109(32.9)	χ^2=6.46^{NS} p=0.0911
	40 or Older(40 – 59)	105(47.3)	75(33.8)	34(15.3)	8(3.6)	222(67.1)	
	Total	149(45.0)	120(36.3)	45(13.6)	17(5.1)	331(100.0)	
Education level	Elementary school	9(39.1)	7(30.4)	1(4.3)	6(26.1)	23(7.0)	χ^2=34.15*** p=0.0001
	Middle school	36(38.3)	46(48.9)	9(9.6)	3(3.2)	94(28.6)	
	High school	89(47.1)	62(32.8)	30(15.9)	8(4.2)	189(57.4)	
	College or higher	14(60.9)	5(21.7)	4(17.4)	–	23(7.0)	
	Total	148(45.0)	120(36.5)	44(13.4)	17(5.2)	329(100.0)	
Household income (10,000won/ month)	Less than 100	26(35.1)	28(37.8)	14(18.9)	6(8.1)	74(22.4)	χ^2=14.00^{NS} p=0.1220
	100 – 200	55(44.7)	46(37.4)	13(10.6)	9(7.3)	123(37.2)	
	200 – 300	42(47.7)	34(38.6)	10(11.4)	2(2.3)	88(26.6)	
	300 or more	26(56.5)	12(26.1)	8(17.4)	–	46(13.9)	
	Total	149(45.0)	120(36.3)	45(13.6)	17(5.1)	331(100.0)	
Food expenses (10,000won/ month)	Less than 50	70(42.7)	60(36.6)	23(14.0)	11(6.7)	164(49.5)	χ^2=6.44^{NS} p=0.3752
	50 – 120	67(47.5)	47(33.3)	21(14.9)	6(4.3)	141(42.6)	
	120 or more	12(46.2)	13(50.0)	1(3.8)	–	26(7.9)	
	Total	149(45.0)	120(36.3)	45(13.6)	17(5.1)	331(100.0)	

N.S : Not Significant ***p<0.001

purchased more than 20 times and 6.9% of these housewives have purchased 11 – 20 times. This result was significantly different from the result which was shown in housewives younger than 40 years(p=0.040). There was significant difference in experience of purchasing special eggs among the groups divided by education level(p=0.020), household income(p=0.0004) and food expenses(p=0.030). Therefore, the higher the housewives' age, education level, household income and food expenses were, the more frequent their purchase of special eggs was.

4. Reason for purchasing special eggs

In Table 6, the reason for housewives' purchasing special eggs was in order of nutrition(45.0%), freshness(36.5% or less), trust(13.6% or less) and price(5.2% or less) in Kyunggi-do and Inchon. Also the higher the housewives' education level(p=0.0001) and household income(p=0.1220) were, the higher the percentage of housewives who purchased special eggs because of nutrition was. In terms of nutrition and trust, this result was very different from a previous result from information collecting from housewives in Seoul (Yeo 1997). It was previously reported that the reason for housewives' purchasing special eggs in Seoul was in order of taste(31.5%), trust(29.5%), other reasons(16.6%), known producer(12.3%), clean package (10.1%) and nutrition(0%)(Yeo 1997).

5. Kinds of special eggs purchased

Table 7 represents the kinds of special eggs purchased by housewives in Kyunggi-do and Inchon. Housewives purchased special eggs in order of vitamin-enriched eggs(41.2% or less), DHA-enriched eggs(34.9% or less), other special eggs(13.8% or less), iodine-enriched eggs(7.8%) and ω3-fatty acidsenriched eggs(2.6%). There was no significant difference in the kinds of special eggs purchased by housewives among the groups divided by age, education level and food expenses. However, there was significant difference among the groups divided by household income ; housewives, whose household income was 1 – 2 million won per month, purchased DHA-enriched eggs(43.8%) and vitamin-enriched eggs(32.8%)

Table 7. Kinds of special eggs purchased by housewives N(%)

Variables	Groups	Vitamin-enriched eggs	Iodine-enriched eggs	DHA-enriched eggs	ω3-fatty acid -enriched eggs	Other special eggs	Total	P value
Age(years)	Younger than 40 (20 – 39)	47(39.2)	9(7.5)	45(37.5	2(1.7)	7(14.2)	20(34.9)	$\chi^2=1.20^{NS}$ p=0.8766
	40 or Older(40 – 59)	94(42.0)	18(8.0)	75(33.5)	7(3.1)	0(13.4)	24(65.1)	
	Total	141(41.0)	27(7.8)	120(34.9)	9(2.6)	47(13.7)	344(100.0)	
Education level	Elementary school	12(52.2)	1(4.3)	8(34.8)	1(4.3)	1(4.3)	23(6.8)	$\chi^2=18.63$ p=0.0978
	Middle school	37(39.4)	15(16.0)	25(26.6)	4(4.3)	13(13.8)	94(27.6)	
	High school	83(41.9)	9(4.5)	73(36.9)	4(2.0)	29(14.6)	198(58.2)	
	College or higher	8(32.0)	2(8.0)	11(44.0)	–	4(16.0)	25(7.4)	
	Total	140(41.2)	27(7.9)	117(34.4)	9(2.6)	47(13.8)	340(100.0)	
Household income (10,000won/ month)	Less than 100	45(58.4)	1(1.3)	18(23.4)	3(3.9)	10(13.0)	77(22.4)	$\chi^2=24.54^{*}$ p=0.0172
	100 – 200	42(32.8)	10(7.8)	56(43.8)	2(1.6)	18(14.1)	128(37.2)	
	200 – 300	33(37.1)	12(13.5)	27(30.3)	3(3.4)	14(15.7)	89(25.9)	
	300 or more	21(42.0)	4(8.0)	19(38.0)	1(2.0)	5(10.0)	50(14.5)	
	Total	141(41.0)	27(7.8)	120(34.9)	9(2.6)	47(13.7)	344(100.0)	
Food expenses (10,000won/ month)	Less than 50	78(46.4)	7(4.2)	56(33.3)	5(3.0)	22(13.1)	168(48.8)	$\chi^2=9.67^{NS}$ p=0.2888
	50 – 120	55(36.7)	16(10.7)	55(36.7)	3(2.0)	21(14.0)	150(43.6)	
	120 or more	8(30.8)	4(15.4)	9(34.6)	1(3.8)	4(15.4)	26(7.6)	
	Total	141(41.0)	27(7.8)	120(34.9)	9(2.6)	47(13.7)	344(100.0)	

N.S : Not Significant *p<0.05

Table 8. Housewives' trust in the brand of special eggs N(%)

Variables	Groups	Trust the brand of special eggs	Trust the brand of special eggs produced by a large company	Do not trust the brand of special eggs	Never trust the brand of special eggs	Total	P value
Age(years)	Younger than 40 (20 – 39)	30(22.4)	24(17.9)	71(53.0)	9(6.7)	134(33.4)	$\chi^2=1.65^{NS}$ p=0.6470
	40 or Older(40 – 59)	51(19.1)	43(16.1)	147(55.1)	26(9.7)	267(66.6)	
	Total	81(20.2)	67(16.7)	218(54.4)	35(8.7)	401(100.0)	
Education level	Elementary school	5(17.2)	1(3.4)	16(55.2)	7(24.1)	29(7.4)	$\chi^2=20.60^{**}$ p=0.0145
	Middle school	23(21.3)	12(11.1)	64(59.3)	9(8.3)	108(27.4)	
	High school	48(20.9)	46(20.0)	122(53.0)	14(6.1)	230(58.4)	
	College or higher	4(14.8)	7(25.9)	12(44.4)	4(14.8)	27(6.9)	
	Total	80(20.3)	66(16.8)	214(54.3)	34(8.6)	394(100.0)	
Household income (10,000won/ month)	Less than 100	14(14.9)	11(11.7)	59(62.8)	10(10.6)	94(23.4)	$\chi^2=12.19^{NS}$ p=0.2028
	100 – 200	31(20.1)	30(19.5)	81(52.6)	12(7.8)	154(38.4)	
	200 – 300	26(26.5)	13(13.3)	53(54.1)	6(6.1)	98(24.4)	
	300 or more	10(18.2)	13(23.6)	25(45.5)	7(12.7)	55(13.7)	
	Total	81(20.2)	67(16.7)	218(54.4)	35(8.7)	401(100.0)	
Food expenses (10,000won/ month)	Less than 50	34(16.7)	31(15.3)	124(61.1)	14(6.9)	203(50.6)	$\chi^2=9.41^{NS}$ p=0.1513
	50 – 120	42(25.0)	29(17.3)	79(47.0)	18(10.7)	168(41.9)	
	120 or more	5(16.7)	7(23.3)	15(50.0)	3(10.0)	30(7.5)	
	Total	81(20.2)	67(16.7)	218(54.4)	35(8.7)	401(100.0)	

N.S : Not Significant **p<0.01

Table 9. Housewives' cooking methods of eggs N(%)

Variables	Groups	Steamed -eggs	Fried -eggs	Egg soup	Rolled -eggs	Scram -bled eggs	Other dishes	Total	P value
Age(years)	Younger than 40 (20 – 39)	29(20.6)	83(58.9)	2(1.4)	19(13.5)	2(1.4)	6(4.3)	141(33.3)	$\chi^2=3.66^{NS}$ p=0.5983
	40 or older(40 – 59)	77(27.3)	141(50.0)	5(1.8)	40(14.2)	3(1.1)	16(5.7)	282(66.7)	
	Total	106(25.1)	224(53.0)	7(1.7)	59(13.9)	5(1.2)	22(5.2)	423(100.0)	
Education level	Elementary school	7(21.2)	17(51.5)	–	8(24.2)		1(3.0)	33(7.9)	$\chi^2=13.56^{NS}$ p=0.5584
	Middle school	24(20.3)	64(54.2)	3(2.5)	16(13.6)	3(2.5)	8(6.8)	118(28.4)	
	High school	64(27.1)	123(52.1)	4(1.7)	31(13.1)	1(0.4)	13(5.5)	236(56.7)	
	College or higher	9(31.0)	16(55.2)	–	3(10.3)	1(3.4)	–	29(7.0)	
	Total	104(25.0)	220(52.9)	7(1.7)	58(13.9)	5(1.2)	22(5.3)	416(100.0)	
Household income (10, 000won/ month)	Less than 100	23(23.5)	53(54.1)	4(4.1)	12(12.2)	1(1.0)	5(5.1)	98(23.2)	$\chi^2=16.87^{NS}$ p=0.3261
	100 – 200	40(23.8)	96(57.1)	2(1.2)	23(13.7)	–	7(4.2)	168(39.7)	
	200 – 300	30(30.0)	43(43.0)	1(1.8)	18(18.0)	3(3.0)	6(6.0)	100(23.6)	
	300 or more	13(22.8)	32(56.1)	–	6(10.5)	1(1.8)	4(7.0)	57(13.5)	
	Total	106(25.1)	224(53.0)	7(1.7)	59(13.9)	5(1.2)	22(5.2)	423(100.0)	
Food expenses (10, 000won/	Less than 50	52(23.90	121(55.5)	5(2.3)	25(11.5)	3(1.4)	12(5.5)	218(51.5)	$\chi^2=6.01^{NS}$ p=0.8074
	50 – 120	43(24.9)	89(51.4)	2(1.2)	29(16.8)	2(1.2)	8(4.6)	173(40.9)	
	120 or more	11(34.4)	14(43.8)	–	5(15.6)	–	2(6.3)	32(7.6)	
	Total	106(25.1)	224(53.0)	7(1.7)	59(13.9)	5(1.2)	22(5.2)	423(100.0)	

N.S : Not Significant

(p=0.0172).

6. Trust in the brand of special eggs

Table 8 represents housewives' trust in the brand of special eggs in Kyunggi-do and Inchon. Only 20.3% or less of subjects trusted the brand of special eggs and 16.8% or less of subjects trusted only the brand of special eggs produced by a large company. Also 54.4% or less of subjects did not trust the brand of special eggs and 8.7% or less of subjects never trust the brand of special eggs. There was no significant difference in consumers' trust among the subject groups divided by age, household income and food expenses. However, there was significant difference among the groups divided by education level ; only 3.4% of housewives who received elementary school education trusted the brand of special eggs produced by a large company and 25.9% of housewives who graduated from college or higher trusted the brand of special eggs produced by a large company(p=0.0145). Because more than half of subjects did not trust the brand of special eggs, it is necessary for the producer of special eggs to gain the consumers' trust.

6. Cooking pattern of eggs

1) Cooking methods of eggs

In Table 9, housewives cooked eggs in order of fried-eggs(53.0% or less), steamed-eggs(25.1% or less), rolled-eggs(13.9%), other cooking methods(5.3% or less), egg soup(1.7%) and scrambled-eggs(1.2%). There

Table 10. Housewives' serving mealtime of egg dishes N(%)

Variables	Groups	Breakfast	Lunch	Dinner	Snacks	Total	P value
Age(years)	Younger than 40(20 – 39)	90(63.4)	9(6.3)	29(20.4)	14(9.9)	142(33.6)	$\chi^2=3.66^{NS}$
	40 or Older(40 – 59)	174(62.1)	18(6.4)	57(20.4)	31(11.1)	280(66.4)	p=0.5983
	Total	264(62.6)	27(6.4)	86(20.4)	45(10.7)	422(100)	
Education level	Elementary school	15(46.9)	4(12.5)	9(28.1)	4(12.5)	32(7.7)	$\chi^2=13.56^{NS}$
	Middle school	78(66.7)	4(3.4)	19(16.2)	16(13.7)	117(28.2)	p=0.5584
	High school	151(63.7)	15(6.3)	49(20.7)	22(9.3)	237(57.1)	
	College or higher	18(62.1)	2(6.9)	8(27.6)	1(3.4)	29(7.0)	
	Total	262(63.1)	25(6.0)	85(20.5)	43(10.4)	415(100.0)	
Household income (10,000won/ month)	Less than 100	63(64.3)	8(8.2)	18(18.4)	9(9.2)	98(23.2)	$\chi^2=16.87^{NS}$
	100 – 200	93(55.7)	12(7.2)	36(21.6)	26(15.6)	167(39.6)	p=0.3261
	200 – 300	71(71.0)	5(5.0)	21(21.0)	3(3.0)	100(23.70)	
	300 or more	37(64.9)	2(3.5)	11(19.3)	7(12.3)	57(13.5)	
	Total	264(62.6)	27(6.4)	86(20.4)	45(10.7)	422(100.0)	
Food expenses (10,000won/ month)	Less than 50	135(61.9)	14(6.4)	47(21.6)	22(10.1)	218(51.7)	$\chi^2=6.01^{NS}$
	50 – 120	108(62.8)	11(6.4)	33(19.2)	20(11.6)	172(40.8)	p=0.8074
	120 or more	21(65.6)	2(6.3)	6(18.8)	3(9.4)	32(7.6)	
	Total	264(62.6)	27(6.4)	86(20.4)	45(10.7)	422(100.0)	

N.S : Not Significant

Table 11. Contingency table of cooking methods of eggs and serving mealtime of egg dihes N(%)

Items	Breakfast	Lunch	Dinner	Snacks	Total	P value
Steamed – eggs	61(23.2)	8(30.8)	30(34.9)	7(15.6)	106(25.2)	$\chi^2=34.94^{**}$
Fried – eggs	142(54.0)	12(46.2)	42(48.8)	25(55.6)	221(52.6)	p=0.0025
Egg soup	7(2.7)	–	–	–	7(1.7)	
Rolled – eggs	41(15.6)	6(23.1)	6(7.0)	6(13.3)	59(14.0)	
Scrambled – eggs	5(1.9)	–	–	–	5(1.2)	
Other egg dishes	7(2.7)	–	8(9.3)	7(15.67)	22(5.2)	
Total	263(62.6)	26(6.2)	86(20.5)	45(10.7)	420(100)	

$^{**}p<0.01$

was no significant difference in cooking me-thods of eggs among the groups divided by age, education level, household income and food expenses.

2) Serving mealtime of egg dishes

Table 10 represents the serving mealtime of dishes made from eggs. Housewives served dishes made from eggs at breakfast(63.1% or less), dinner(20.5% or less), snack(10.7% or less) and lunch(6.4% or less). There was no significant difference in the serving time of dishes made from eggs among the groups divided by age, education level, household income and food expenses.

3) Interrelation between cooking methods of eggs and serving mealtime of egg dishes

In Table 11, fried-eggs were served more for snacks (55.0%) and breakfast(54.0%). However, steamed-eggs were served more for dinner(34.9%) than for breakfast (12.3%) and snacks(15.6%), which was statistically significant($p=0.0025$). Because eggs are cheap and easy to cook, they are popular with housewives and the most popular dish made from eggs was fried-eggs which was served more for breakfast and snacks.

Summary and Suggestion

This survey was conducted using questionnaires to investigate consumers' behavior in purchasing special eggs and the cooking patterns of eggs. The subjects were 435 housewives whose children were middle or high school students and the survey was carried out from July 15 of 1996 to July 30 of 1996.

The results are summarized as follows :

1) Most housewives knew about the sale of special eggs. However, most housewives knew about 1 - 5 kinds of special eggs, although more than 30 kinds of special eggs were commercially available. Also most housewives perceived that the price of special eggs was expensive.

2) The higher housewives' age, education level, household income and food expenses were, the more frequent their purchase of special eggs was.

3) The reason for housewives' purchasing special eggs was in order of nutrition and freshness. The higher housewives' education level and household income, the higher the percentage of those who purchased special eggs because of nutrition was.

4) Most housewives who purchased special eggs chose vitamin-enriched eggs and DHA-enriched eggs.

5) Only 20.3% or less of the subjects trusted the brand of special eggs and 16.8% or less of subjects trusted only the brand of special eggs produced by a large company. There was significant difference in the consumers' trust among the groups divided by education level.

6) For these housewives, the most popular dish made from eggs was fried-eggs, which was served more for breakfast and snacks.

From the above results, suggestions are as follows :

1) The price of special eggs is too expensive compared to the price of normal eggs. Therefore, it is necessary to supply special eggs at a reasonable price.

2) Eggs have to be treated as a fresh food. Therefore, eggs have to be transported from the point of production to the point of sale as quickly as possible.

3) Recently there were concerns about the negative health effects of eating too many eggs because of the cholesterol content. Also increased buying power is going to allow consumers to purchase more expensive substitutes for eggs, such as meats and convenience foods. Also eggs have higher quality protein and more vitamins and minerals than meats and convenience foods. Recently special eggs which are modified to reduce the concentration of cholesterol are commercially available. Therefore, it is necessary to produce special eggs which are better for good health and nutrition.

4) Eggs are popular with housewives because they are cheap and easy to cook. It is suggested that additional dishes made from eggs be developed for quickly-prepared meals.

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