

## Service Quality Measurement of In-Flight Meal Service: A Comparison between Korean and Foreign-Based Airlines

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### ABSTRACT

The current exploratory study investigates and compares the perceptions of the service quality of in-flight meals through the evaluation of recent consumers (within 2 weeks) of services provided by Korean and foreign-based airlines. Twenty (20) items for measuring service quality were categorized into three factor dimensions of 'food quality', 'employee service', and 'professionalism'. Among these, 'employee service' was rated highest by Korean and foreign-based airlines. When items representing each service quality dimension were analyzed and compared, only the 'food quality' dimension of Korean-based airlines was perceived higher than that of other foreign-based airlines. Findings also revealed a spectrum with some items with higher or lower mean values within each service quality dimension. Results of this study can be expected to be used to benefit both from a theoretical and practical point of view by providing empirical data that measure the service quality of in-flight meal service. (*J Community Nutrition* 8(3): 153~159, 2006)

**KEY WORDS:** service quality · in-flight meal service · Korean-based airlines · foreign-based airlines.

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### Introduction

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The first in-flight meal was served on October 1919 on a flight from London to Paris. Before the 1978 deregulation of U.S. airlines, the price of any domestic flight was predetermined, but not through competition. Even on 85-minute short flights, complete hot meals were served (Pincus 2001). However, deregulation has changed all aspects of airline operation. The airlines' abilities to offer food service was directly affected. In this new competitive environment, decreasing the number of flight attendants and controlling the food costs were inevitable. Passengers' expectations of in-flight service have dropped as competition increased.

The image and quality of in-flight meal service is described by some consumers as inadequate or inferior (Nomani 1999). When Cardello et al. (1996) investigated the expected acceptability of the 12 foods in different foodservice settings, airline

foodservice ranked lowest along with hospital foodservice. As the results indicate, low media perception of in-flight meal quality is one of the key issues the industry is facing. It ranked around tenth in some surveys after timely departure or arrival, quality of the aircraft, and baggage handling, among others (King 2001). It was reported by the UK's independent Air Transport Users Council that in-flight service was subject to only 5% of written complaints and 3% of telephone complaints in 2000. Despite its low ranking and low complaint rate, it does not mean that airline foodservice is unimportant. A report indicated that frequent fliers would fly in an airline whose food service was superior (Business Wire 1998). If the meal service is not appetizing, experience of the flight is likely to be considered bland by passengers (Tu 1997). In-flight meal service plays a vital role in the total travel experience and serves as the deciding factor in differentiating the quality of service of an airline from that of competitors (King 2001; Mill, Clay 2001).

Delivering high quality service is one element of strategic importance for the success of businesses (Rudie, Wansley 1985). According to SERVQUAL, which assessed service quality, quality is the gap between customer expectations and their perception on performance (Parasuraman et al. 1988).

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Despite its popularity and its continued use in many service industries, there have been criticisms relating to this measurement. Most were about the use of expectation as a comparison standard. Others pointed out the problem of timing which measures expectations and whether expectations should be measured before or after actual performance (Getty, Thomson 1994; Weber 1997). Dorfman (1979) argued that when expectations are measured, those could lead to consistently high expectation ratings compared to an existing level. Also, expectations are measured in situations where a customer's lack of experience may cause problems (Halstead et al. 1994). Another category of criticism focuses on the five dimensions of SERVQUAL. Through their empirical studies, some of researchers suggest fewer dimensions by merging or deleting a few these (Getty, Thompson 1994; Parasuraman et al. 1994).

Based on the foregoing theoretical and operational problems related to the measurement of expectations, some studies indicated that the performance dimension alone only could predict behavioral intentions and behaviors (Mazis et al. 1975). When service is performed well, the consumer would be satisfied, notwithstanding expectations. Churchill and Surprenant (1982) conducted an experiment to examine the effects of expectations, performances, and disconfirmation on satisfaction. Results showed that performance alone determined the satisfaction of the respondents. Much of marketing literature supports the superiority of simple performance-based measures of service quality. Thus, in the present study, performance-based measures of service quality are adopted from previous studies.

While there had been a number of research studies investigating the service quality of the hotel and travel industries, research which measures service quality in the restaurant industry is limited. To date, no standardized service quality instrument for the in-flight meals exists today. As the airline industry becomes more competitive, the high quality of food-service on board can be viewed as a point of differentiation between competitors.

This study aims to explore consumer perceptions on in-flight meal service. Airlines were divided by Korean and foreign based to investigate the competitiveness of Korean based airlines compared to the foreign based airlines and to know the present address of each. Its objectives are 1) to measure the service quality of in-flight meal service, and 2) to investigate the competitiveness of Korean-based airlines compared to foreign-based airlines in regard to the service quality

of in-flight meal service. Results of this study may benefit both the industry and academe by establishing an operational strategy based on understanding the passengers' perceptions, and providing empirical data that measure the service quality of airline in-flight meal service.

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## Subjects and Methods

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### 1. Sample and data collection

Inclusion criteria for sample selection were limited to those who had taken international flights within two weeks of the time of the fielding of the instrument. Environments for survey purposes were chosen to represent a sample population that has recently taken an international flight and represents various nationalities and different airlines. The sample was collected conveniently in international chain hotels in the Philippines from February 11 through March 5, 2004, and Incheon international airport in Korea from April 4 through April 8, 2004. Of the 524 questionnaires administered, a total of 367 completed questionnaires were returned, yielding a response rate of 70%.

### 2. Research instrument

In this study, to measure the service quality of in-flight meals, the survey questionnaire was partly modified through extensive literature review and partly developed through focus group interview with expert panels of the airline industry. Among the items of SERVQUAL, those related to the provision of service environment were not included in the questionnaire, since those were regarded as airplane facilities and not factors that affect meal service. Moreover, confusion was minimized by adding the phrase 'for meal service' at the end of the sentence in some of items to avoid confusion with other items of on board services. Items identified as important in previous research were also added. A pilot test was conducted on 65 passengers for purposes of verifying that the test items were well formulated. Through the computation of Cronbach's alpha, two items were deleted from initial 22 items leaving 20 items for the final survey.

The self-administered questionnaire had three sections. The first section was intended to get the respondents' most recent flight information. The second section measured the perceived service quality of in-flight meal service represented by 20 items. Respondents were asked to recall their latest in-flight meal service experiences and to indicate the extent to which

they agree with the statements based on the Likert five-point scale. The last section of the questionnaire consisted of demographic items.

### 3. Data analysis

SPSS 10.0 for Windows was used to analyze data, and factor analysis was applied to identify service quality dimensions. Multivariate analysis of variance (MANOVA) was used to identify significant differences between Korean and foreign-based airlines in regard to service quality perceptions on items of each dimension.

## Results and Discussion

### 1. Description of respondents

Table 1 displays the demographics of the samples. Males were somewhat higher (57.1%) in the samples of Korean based airlines. The samples were almost evenly dispersed between males (51.9%) and females (48.1%) in foreign-based airlines. There was a higher percentage of respondents in the 18 to 35 age groups in Korean-based airlines and in the 18 to

**Table 1.** Descriptive characteristics of the research sample

Variables		Korean-based airline (n = 208)	Foreign-based airline (n = 159)
		Frequency (%)	Frequency (%)
Gender	Male	117 (57.1)	82 (51.9)
	Female	88 (42.9)	76 (48.1)
Age	18 to 35	115 (56.4)	66 (43.7)
	36 to 50	76 (37.3)	60 (39.7)
	51 to 70	13 (6.4)	25 (16.6)
Nationality	Korea	200 (97.1)	1 (0.6)
	Philippines	–	20 (12.7)
	China	1 (0.5)	3 (1.9)
	Japan	1 (0.5)	6 (3.8)
	S.E. Asia (excluding Philippines)	1 (0.5)	2 (1.3)
	Europe	2 (1.0)	34 (21.7)
	Americas	1 (0.5)	53 (33.8)
	Australia/New Zealand	–	19 (12.1)
	Other	–	19 (12.1)
Education	Elementary school	–	2 (1.3)
	Middle school	2 (1.0)	3 (1.9)
	High school	22 (10.7)	11 (7.0)
	Junior college	25 (12.2)	6 (3.8)
	University	116 (56.6)	79 (50.3)
Occupation	Graduate school	40 (19.5)	56 (35.7)
	Professional	63 (31.0)	51 (32.5)
	Teacher	3 (1.5)	59 (37.6)
	Proprietor	15 (7.4)	3 (1.9)
	White collar	56 (27.6)	6 (3.8)
	Blue collar	2 (1.0)	2 (1.3)
	Students	28 (13.8)	13 (8.3)
	Homemaker	19 (9.4)	3 (1.9)
	Retired	3 (1.5)	8 (5.1)
Family income (US \$ monthly)	Other	14 (6.9)	12 (7.6)
	Below \$300	3 (1.6)	2 (1.5)
	\$300 – \$500	3 (1.6)	1 (0.7)
	\$501 – \$1,000	10 (5.2)	4 (3.0)
	\$1,001 – \$1,500	26 (13.5)	3 (2.2)
	\$1,501 – \$2,000	47 (24.5)	10 (7.4)
	\$2,001 – \$3,000	43 (22.4)	36 (26.7)
	\$3,001 – \$5,000	30 (15.6)	36 (26.7)
Above \$5,000	30 (15.6)	43 (31.9)	

35 and 36 to 50 age groups in foreign-based airlines. Most of the respondents were Korean in Korean-based airlines, whereas a variety of nationality was mixed in foreign-based airlines. Both samples were very well educated. As to occupation, 31.0% of the respondents were professionals and 27.6% were white-collar workers in Korean based airlines, while 37.6% were teachers and 32.5% were professionals of foreign-based airlines. Income of the respondents of Korean-based airlines was considerably lower than those of foreign-based airlines.

## 2. Information on the most recent flight

Table 2 gives information on the most recent flights of respondents. In both samples, the most recent time of international flights was predominantly 'today'. As to the kind of

airline, 65.4% of the respondents took KAL, followed by Asiana (34.6%) on Korean-based airlines, while respondents of foreign-based airlines mixed with various passengers. Most respondents traveled in the economy class section. The purpose of traveling was 'individual' (38.9%), followed by 'business trip' (34.6%), and 'group tour' (17.3%). 'Individual purpose' (67.9%) was predominant on foreign-based airlines. In both instances, the decision maker of choice (Korean-based airlines, 50.7% was the passenger himself, in foreign-based airlines, 47.4%), the travel agency (24.6% vs. 33.3%), and so on. Around 60% to 70% of the respondents have had long-distance flights more often than 2 – 3 times a year for the last 3 years.

**Table 2.** Information on recent flight

Variables		Korean-based airline (n = 208)	Foreign-based airline (n = 159)
		Frequency (%)	Frequency (%)
Time of the most recent international flight	Today	118(56.7)	73(45.9)
	Within 2 – 3 days	36(17.3)	25(15.7)
	Within 1 week	27(13.0)	31(19.5)
	Within 2 weeks	27(13.0)	30(18.9)
Kind of airline	KAL	123(65.4)	–
	Asiana	65(34.6)	–
	Philippine	–	34(19.2)
	Cebu pacific	–	8( 4.5)
	Singapore	–	16( 9.0)
	UA	–	20(11.3)
	Northwest	–	11( 6.2)
	Qantas	–	11( 6.2)
	Cathay pacific	–	7( 4.0)
	JAL	–	14( 7.9)
	Lufthansa	–	9( 5.1)
	KLM	–	6( 3.4)
	Air Canada	–	5( 2.8)
Other	–	36(20.3)	
Class	Economy class	181(87.0)	130(82.3)
	Business class	27(13.0)	25(15.8)
	First class	–	3( 1.9)
Nature of travel	Group tour	36(17.3)	10( 6.3)
	Business trip	72(34.6)	31(19.5)
	Individual purpose	81(38.9)	108(67.9)
	Incentive tour	19( 9.1)	1( 0.6)
	Pilgrimage	–	8( 5.0)
	Other	–	1( 0.6)
Decision maker	Travel agency	51(24.6)	52(33.3)
	Myself	105(50.7)	74(47.4)
	Family members	25(12.1)	14( 9.0)
	Colleague or boss	17( 8.2)	11( 7.1)
	Other	9( 4.3)	5( 3.2)
Frequency of a long-distance flight for the last 3 years	More than once a month	12( 5.8)	10( 6.3)
	Once every 2 – 3 months	27(13.1)	30(19.0)
	2 – 3 times a year	85(41.3)	71(44.9)
	Once a year	32(15.5)	33(20.9)
	Rarely	36(17.5)	13( 8.2)
Latest flight was my first time	14( 6.8)	1( 0.6)	

**Table 3.** Pooled factor analysis of perceived service quality

Factors	Loadings	Eigenvalue	Percentage of variance explained	Cronbach's alpha
Factor 1: Food quality		8.82	44.1	.88
Taste of food	.85			
High quality ingredients	.78			
Appearance of food	.76			
Sufficient preparation for choice of menu	.75			
Variety of menu	.69			
Freshness of food	.68			
Food consistency	.62			
Adequate portion size	.51			
Nutrition	.41			
Factor 2: Employee service		2.12	10.6	.91
Clean and well-dressed employees	.91			
Polite and courteous employees	.88			
Cleaned equipment	.87			
Sensitiveness to customer needs for meal service	.76			
Well-trained and experienced employees	.74			
Prompt and quick meal service	.72			
Proper handling of special requests on meal service	.59			
Prompt correction of mistakes	.54			
Good food temperature	.44			
Anticipating the needs of the guests well	.39			
Factor 3: Professionalism		1.18	5.9	
Menu knowledgeable employees	.52			

**Table 4.** Within-Group assessment of service quality dimensions for each sample

	M	SD	t-value	Significance
Korean-based airlines				
Employee service	3.76	.69		
Food quality	3.29	.63	-11.355	0.000
Professionalism	3.11	1.02	2.726	0.007
Foreign-based airlines				
Employee service	3.72	.72		
Professionalism	3.26	1.17	6.724	0.000
Food quality	3.18	.73	-.894	.373

Each dimension is compared with the dimension following it

### 3. Perceived service quality of in-flight meal service

The 20 items representing the service quality of in-flight meal services were factor analyzed, using principal components analysis with oblimin rotation, resulting in three factor dimensions. The factor pattern accounted for 60.6% of the total variance. Each factor dimension was identified according to common characteristics. Table 3 presents a list of three-factor dimensions, along with the items which represent them with associated factor loadings, eigenvalues, and reliability scores. The first factor, food quality, consisted of nine items and made up 44.1% of the total variance. It included items such as taste of food, high quality ingredients, appearance of food, sufficient preparation for choice of menu, menu variety, freshness of food, food consistency, adequate portion size,

and nutrition (Cronbach's alpha = .8752). The second factor, employee service, included 10 items referring to 10.6% of the total variance. It relates to service behaviors representing efforts made to please customers such as clean, well-dressed and courteous employees, response to customer needs for meal service, well trained and experienced employees, among others (Cronbach's alpha = .9127). Providing 'cleaned equipment' and 'good food temperature' were also regarded as a kind of employee service in a large range.

The third factor, professionalism, consisted of one item menu knowledgeable employees, explaining 5.9% of the total variance.

To assess the service quality dimensions of each group, scores on the items included in each factor were coded into

**Table 5.** Multivariate analyses of the service quality dimensions of in-flight meal service

	Korean-based airlines		Foreign-based airlines		F-value	Significance
	M	SD	M	SD		
Factor 1: Food quality						
Taste of food	3.14	.76	3.06	.99	.62	.433
High quality ingredients	3.26	.82	3.17	.94	1.00	.318
Appearance of food	3.40	.84	3.18	.92	5.30	.022
Sufficient preparation for a choice of menu	3.06	1.13	3.09	1.18	.06	.813
Variety of menu	2.71	1.06	2.86	1.11	1.60	.207
Freshness of food	3.42	.93	3.23	.97	3.11	.079
Food consistency	3.54	.84	3.30	.97	6.00	.015
Adequate portion size	3.51	.97	3.41	1.11	.80	.373
Nutrition	3.49	.86	3.47	.91	.05	.817
Multivariate $F = 2.104, p = 0.029$						
Factor 2: Employee service						
Clean and well-dressed employees	4.13	.87	4.10	.95	.13	.724
Polite and courteous employees	4.01	.91	3.90	.96	1.13	.29
Cleaned equipment	4.17	.91	4.16	.85	.01	.905
Sensitive to customers' needs for meal service	3.73	.88	3.59	.98	1.78	.183
Well-trained and experienced employees	3.65	.91	3.74	.91	.74	.389
Prompt and quick meal service	3.72	.94	3.67	.95	.21	.650
Proper handling for special requests on meal service	3.59	.92	3.41	1.11	2.42	.121
Prompt correction of mistakes	3.55	.91	3.41	.93	1.91	.168
Good food temperature	3.70	.98	3.73	1.03	.06	.803
Anticipating guests' needs well	3.31	.86	3.24	1.05	.46	.496
Multivariate $F = 1.370, p = 0.193$						
Factor 3: Professionalism						
Menu knowledgeable employees	3.11	1.02	3.26	1.17	1.66	.199

summary variables with an aggregate score (Table 4). Paired sample t-tests were used to evaluate the differences in the factor dimensions within each of the two groups. Respondents on Korean-based airlines rated 'employee service' with the highest mean value (3.76), followed by 'food quality' (3.29), and then 'professionalism' (3.11). The means of all factor dimensions statistically differed from one another. The respondents on foreign-based airlines also evaluated 'employee service' highest (3.72), followed by 'professionalism' (3.26) and 'food quality' (3.18) with no significant difference in these two dimensions.

MANOVA was used to analyze items of three-factor dimensions separately to determine the group differences associated with the composition of each dimension. Results of the MANOVA are shown in Table 5, along with the findings of the post hoc univariate tests analyzing the individual items comprising each dimension. Among multivariate tests, only the 'food quality' dimension was significantly different ( $F = 2.104, p = 0.029$ ). A breakdown analysis of the items in this dimension indicated that respondents traveling on Korean-based airlines assessed 'food consistency' and 'food appearance' statistically higher than respondents using the foreign-

based airlines.

The mean score and standard deviation of items for each factor dimension were also calculated. Of the nine items comprising the 'food quality' dimension, respondents using Korean-based airlines rated 'food consistency' highest, 'adequate portion size,' second, and 'nutrition,' third. Respondents using foreign-based airlines assessed 'nutrition' as first; 'adequate portion size,' second; and 'food consistency,' third. In both samples, 'taste of food' and 'sufficient preparation for a choice of menu' scored lower and 'variety of menu,' last. Of the ten items comprising the 'employee service' dimension both samples rated 'clean equipment' highest, followed by 'clean and well-dressed employees'; and 'polite and courteous employees'. 'Anticipating the guests' needs well' rated the lowest score.

## Summary and Conclusion

This study determined the service quality levels of in-flight meal service that passengers had actually experienced. Respondents consisted of passengers on Korean and foreign-based airlines. Twenty (20) items for measuring the service

quality of in-flight meal service were categorized into three factor dimensions-- food quality, employee service, and professionalism. Respondents of Korean and foreign-based airlines assessed and rated 'employee service' high compared to 'food quality' and 'professionalism'. Even the 'food quality' of Korean-based airlines was perceived higher compared to that of foreign-based airlines, the mean value of 'food quality' was only slightly higher than medium. Considering that frequent passengers prefer an airline whose food is superior (Business Wire 1998), Korean-based airlines must focus on further improvement of food and service quality to retain further increase in patronage. Managers must pay special attention to further enhance the quality of services such as 'variety of menus' and 'sufficient preparation for a choice of menu' in 'food quality' dimension which was assessed lower than foreign-based airlines. 'Variety of menu' which was assessed lowest among 20 variables can be satisfied by increasing the number of menu choices but it is not the best way from an airline company's standpoint. Considering that majority of respondents of this research were the customers taking international flights more than 2 - 3 times a year, developing the different pattern of menu cycle can be the solution for this. Moreover, menu preference needs to be analyzed to give basic information for menu demand forecasts. When a menu was prepared according to the forecasted demand, passengers would feel the menu was prepared sufficient for a choice.

Results of this study cannot be compared directly with those of other studies, as there is virtually no previous research into measuring perceptions of in-flight meal service quality. Furthermore, the questionnaire was developed through literature review and by an expert panel, which makes comparisons with other research more difficult.

From a practical standpoint, how each individual airline differs in its service quality of in-flight meals would be more interesting. Future researchers may want to explore empirically the influence of the service quality of in-flight meals on airline satisfaction levels and behavioral intentions such as

loyalty and post purchase perception.

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