

Evolution of the Demand for Human Resources in the Food Industry

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식품관련 기업 수요 인력에 대한 연구

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국문요약

본 연구는 식품 관련 기업과 공공기관에서 요구되는 인력의 역량 항목과 전공과목의 업무 관련 중요도를 조사하고, 여러 종류의 식품 관련 자격증에 대한 가치를 추정하여 식품 관련 인력의 수요를 예측하고자 하였다. 또한 설문 조사 결과의 신뢰성을 높이기 위해 식품 기업과 공공 기관의 업무 경험이 적어도 3년 이상된 실무자들을 대상으로 설문 조사를 실시하였다. 기업 및 공공기관에서 신입사원 채용 판단 기준 분석에 있어서 가장 중요하게 보는 것은 인성 및 성격, 식품전문지식 및 컴퓨터 능력의 순으로 나타났다. 기업별 및 공공기관으로 나누어 볼 때, 공공기관에서는 식품전문지식, 출신학교 및 학력이 기업군에 비해 중요하게 여기고 있으며, 자격증은 위탁급식업체에서 가장 중요하게 판단하는 것으로 나타났다. 업무와 전문과목 관련 중요도 분석 결과, 법규 및 위생 관련 과목이 중요하게 판단되는 것으로 나타났다.

Key word: manpower, competence, major subject, license premium, food company

INTRODUCTION

The Korean economy has developed remarkably but has also experienced the rearrangement of industrial structures since the economic crisis of 1997. Radical changes in Korea's economic situation have been anticipated after the agreement of FTA (Free trade agreement)/FTA fulfillment. From the macro point of view, labor market demand always exceeded labor supply before IMF (International Monetary Fund) in 1997. However, the labor system has changed since IMF (Kim ST 2006). Moreover, companies have tried to hire personnel who satisfy a company's needs, such as those with technological skills, higher educational background, etc. Under such circumstances of industrial change, the demand for high-level manpower has gradually increased while the demand

for low-level manpower has decreased (Chun et al. 2007; William et al. 1987). The food industry has been no exception, and students having food science degrees have increased but they often lack any higher educational background or skill. Consequently, the food industry wants to hire manpower that has experience or training courses (Imungi et al. 1986). A survey conducted by an industrial resource committee showed that the shortage of industrial manpower was 6.77% in 2004 and 5.88% in 2005, respectively. Although many universities in Korea annually provide thousands of graduated students, the industrial sector is still experiencing a shortage of adequate and immediately available manpower (Hong et al. 2008). Therefore, recently universities and companies have cooperated to cover common needs. Because of the improvements in everyday life and the use of the internet, universities

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have experienced changes in consumer patterns and the distribution of goods together with the food industry.

The educational programs at universities have been reprogrammed to meet the demands of Korean companies, i.e., (Baik MY 2008; Chang KS 2005; Wongo L 1999). These are classified into three categories, i.e., food processing and engineering, food life science and biological engineering, and food industries and distribution. This also suggests that those who are involved in the food industry need certifications. However, until now, the food industrial requirements for manpower and academic programs for better education toward job related programs had not been surveyed. Therefore, the purpose of this research was to study the mutual relationships between academic and industrial aspects pertaining to human resources with the hope of providing qualified manpower to the food industry by improving academic programs. This work may also offer a path for students who want to find careers in the food industry.

METHODS

1. Research Subjects

The research subjects were divided into the following five groups by business classification: food manufacture/processing and food sales, distribution industry and import sales, consigned institutional feeding, food service industry and hotel service industry, and public organizations, based on the Act of Food Sanitation and Health Functional Foods (Health Functional Food Law 2010).

The respondents (n=249, Seoul, Gyunggi, Chungnam area, Aug. 01. 2011~Aug. 31. 2011) were restricted to individuals with hands-on experience or administrators. Namely, the respondents were composed of individuals from food manufacture/processing (n=58), health functional food manufacture/processing (n=52), food sales (n=60), catering (n=46), and public organizations (n=33).

2. Survey Items

The survey items included the current status of the respondent and company (business type, annual sales, gender, age, working periods, department, and position), suitability of college department names, capability, majors, and wage premium for food sectors licenses. The choices for department names in the survey were the most frequently used names in Korea. The variables with specific influence on recruitment into a company or public organization were education background, major, license, linguistic

ability (focusing on English and Japanese), personality (activeness and manner), and OA ability (MS Word, Hanguk, Excel, and PowerPoint) (Martin HJC 2001). A 5 point scoring method was used (Parameshwaran et al. 2009). A score of 1 indicated that the respondent felt it was less than important, 2 indicated it was of little importance, 3 meant that it was of average importance, 4 indicated it had significant importance, and 5 meant it was extremely important. The limit of application of various majors was assessed by dividing them into six groups. The first group was basic subjects that included nutrition, biochemistry, food chemistry, food science, and food microbiology. The second group was food processing subjects that included food processing, food preservation, food engineering, food operating units, and food packing. The third group was regulations and hygiene that included food sanitation acts, laws for health functional foods, food hygiene, and public health. The fourth group was marketing and circulation, which included food distribution and marketing, institutional food service and nutrition, food service industry, and cost management. The final group pertained to cooking such as cooking principles, cooking practices, sauce making, and flavor enhancers. Food sector related licenses included nutritionist, food industry engineer, cook, and hygienist.

3. Statistical Analysis

The results are expressed as mean±S.D. Group comparisons were performed using Student's *t* test. Analysis of variance (ANOVA) was performed for comparisons among groups, and differences among samples were examined using Duncan's multiple range tests using SAS (version 9.13, SAS Institute, Cary, NC). $P < 0.05$ were considered significant (Lee et al. 1998).

RESULTS AND DISCUSSION

1. Statistics for Sociology of the Population

Basic statistics for variables of the survey population are shown in Table 1. Among the 249 respondents, three persons were excluded because of insufficient answers. The number of male respondents was 163 and the number of females was 83. The average male respondent was in his thirties and the average length of work experience was 10.78 years. Figure 1 shows the job departments and positions of the respondents. The majority worked in marketing or planning areas and institutions as well as sales and personnel management, in sequence. The positions of the respondents included assistant manager, manager, general

Table 1. Basic statistics about variable of society population

Variables	Mean±S.D.
Gender	1.34±0.47 1: Male, 2: Female
Age	2.30±0.62 1: 20's, 2: 30's, 3: 40's, 4: 50's, 5: >60's
Period of work	10.78±5.15 Years

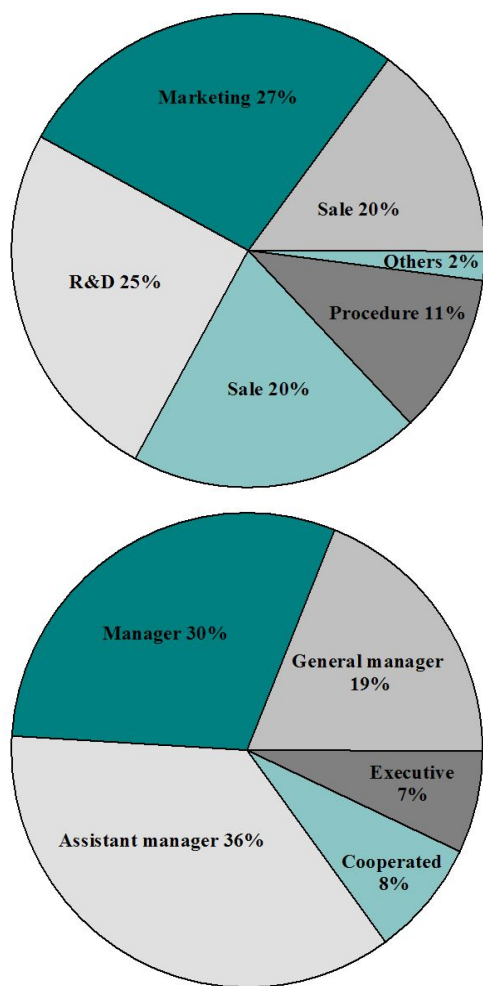


Fig. 1. Departments of work and positions.

manager, supportive, and executive, in order. While the average was ten years of continuous service, the general manager position held a certain percentage. This may be the result of different level systems between production workers and workers within research, marketing, and administration (Lindley RM 1996). The business types of the respondent's companies are shown in Figure 2. Manufacturing made up the highest percentage (44%) in which general manufacturing consisted of 23% and functional manufacturing was 21%. Sales also had a high percentage (25%).

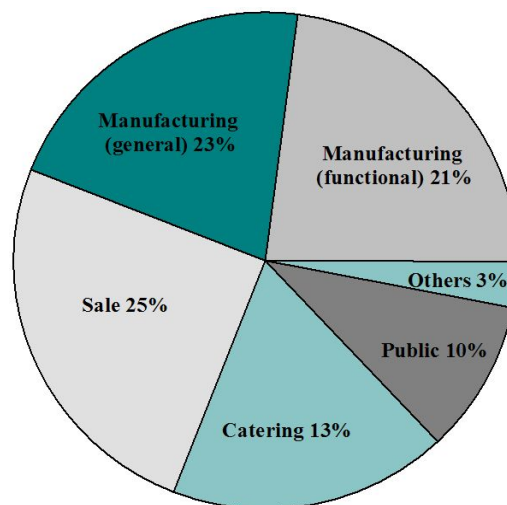


Fig. 2. Characteristics of companies.

2. Evaluation of Suitability of College Department Names

The results show that 33.15 percent of the total respondents deemed Food and Nutrition as a suitable name for a college department (Table 2). The suitability of college department names was in the following order: Food engineering (28.29%) > Food life engineering (14.00%) > Food science (13.25%) > Food biological engineering (10.95) > others (5.59%). The effects of the business types of the respondent companies on answers for the suitability of college department names are shown in Table 3. Among the department names in the survey, most of the respondents answered that Food Nutrition and Food Engineering were suitable college department names regardless of business type. For example, in the results, the respondents working in manufacturing and public health answered that Food Engineering

Table 2. Preference evaluation of respondent with relevant department in food company of suitability for college department name

Department	Suitability ¹⁾
Food and Nutrition	33.15±1.52 ^{e2)}
Food Engineering	28.29±1.26 ^d
Food Life Engineering	14.00±0.88 ^c
Food Science	13.25±0.67 ^c
Food Biological Engineering	10.95±0.79 ^b
Others	5.59±0.88 ^a

¹⁾ Mean±standard error,

²⁾ Superscripts in a low indicated significantly difference at $p < 0.05$ by Duncan's multiple comparison.

Table 3. Effects of business type of respondent's company on answer for suitability for department name in college

	Food and Nutrition	Food Engineering	Food Life Engineering	Food Science	Food Biological Engineering	Others
Manufacturing (general)	26.98±2.87 ^{ab1)}	35.86±2.89 ^c	16.29±2.36 ^a	13.10±1.65 ^a	13.02±2.12 ^{ab}	4.68±2.01 ^a
Manufacturing (functional)	23.75±2.55 ^a	28.75±2.17 ^{bc}	17.50±1.22 ^a	13.37±1.29 ^a	13.17±1.49 ^{ab}	3.27±1.99 ^a
Sale	38.17±3.05 ^b	31.25±2.91 ^{bc}	11.75±1.79 ^a	13.42±1.60 ^a	9.92±1.79 ^{ab}	5.08±1.86 ^a
Catering	55.22±3.25 ^c	12.72±1.71 ^a	9.67±2.12 ^a	13.26±1.36 ^a	6.02±1.10 ^a	6.70±1.75 ^a
Public health	17.80±2.08 ^a	33.40±2.94 ^c	13.40±1.38 ^a	12.60±1.23 ^a	11.20±1.27 ^{ab}	11.60±2.34 ^a
Others	22.50±6.48 ^a	21.88±3.55 ^{ab}	18.13±4.62 ^a	14.38±2.20 ^a	16.88±3.40 ^b	5.00±2.67 ^a

¹⁾ Mean±Standard error, ²⁾ Superscripts in a low indicated significantly difference at $p<0.05$ by Duncan's multiple comparison.

was the most suitable name. Whereas respondents working in sales, catering, and other areas answered that Food and Nutrition was significantly the most suitable name. Therefore, these results will be helpful for employment counseling.

3. Standards for Recruiting

Table 4. Influence of specification on recruitment in company or public organization

Variables	Importance
Education background	3.43±0.05 ^{b1)}
Major	4.16±0.05 ^d
License	3.24±0.06 ^a
Linguistic ability	3.41±0.05 ^{ab}
Personality	4.41±0.04 ^e
OA ability	3.65±0.05 ^c

¹⁾ Mean±Standard error. Superscripts in a low indicated significantly difference at $p<0.05$ by Duncan's multiple comparison.

The specific influences on recruitment into companies or public organizations are shown in Table 4. The variables included educational background, major, license, linguistic ability, personality, and OA ability. The respondents mostly demanded personality when recruiting into companies or public organizations and the second most significantly important variable for recruitment was major. Educational background, food sector related licenses, linguistic ability, and OA ability were shown to be the lower scoring responses, respectively. The effects of the business types of the respondents' companies on answers for screening standards of recruiting are shown in Table 5. The respondents answered that personality and major were the most important regardless of business type. It was deemed most important to consider personality and character when recruiting. Professional food knowledge and computer handling ability were also highly considered. In the analysis of public and private food companies, public companies viewed professional food knowledge, academic career, and academic records as very important aspects, while private

Table 5. Influence of business type of food company or characteristics of public organization on screening standard of recruiting

	Education background	Major	License	Linguistic	Personality	OA ability
Manufacturing (general)	3.34±0.12 ^{1)a}	4.14±0.10 ^a	3.16±0.11 ^a	3.41±0.10 ^{abc}	4.41±0.09 ^{ab}	3.53±0.09 ^a
Manufacturing (functional)	3.31±0.11 ^a	4.19±0.08 ^a	3.13±0.12 ^a	3.27±0.08 ^{ab}	4.33±0.09 ^a	3.56±0.11 ^a
Sale	3.47±0.11 ^a	4.08±0.11 ^a	3.10±0.13 ^a	3.62±0.11 ^{bc}	4.45±0.08 ^{ab}	3.82±0.09 ^a
Catering	3.20±0.10 ^a	3.98±0.13 ^a	4.07±0.15 ^b	3.02±0.09 ^a	4.33±0.09 ^a	3.70±0.11 ^a
Public health	4.16±0.11 ^b	4.64±0.10 ^b	2.72±0.12 ^a	3.84±0.13 ^c	4.72±0.11 ^b	3.64±0.13 ^a
Others	3.63±0.26 ^a	4.13±0.23 ^a	2.63±0.26 ^a	3.50±0.27 ^{bc}	4.25±0.16 ^a	3.50±0.27 ^a

¹⁾ Mean ±Standard error. Superscripts in a low indicated significantly difference at $p<0.05$ by Duncan's multiple comparison.

food companies viewed food related licenses as very important. Therefore, people who want to find jobs in public companies should focus on abilities pertaining to professional food knowledge, academic careers, and academic records, while those who want to find jobs in private food companies should focus on obtaining licenses along with having a good personality and good character.

4. Importance of Correlations between Major Subjects and Work

The importance of correlations between major subjects and work, and the influence of relationships between major subjects and the business types of the companies or public organizations are shown in Tables 6 and 7. For the analysis of general and professional work, the most important areas were food related laws and food hygiene followed by principle subjects, marketing subjects, and food processing subjects. Food related laws and hygiene were considered very important to both public organizations and food companies while public organizations viewed principle

Table 6. Importance of correlation between major subjects and work

Variance	Importance
Basic	3.68±0.05 ^{c1)}
Process	3.52±0.06 ^b
Law and Sanitation	4.00±0.05 ^d
Marketing	3.62±0.06 ^{bc}
Analysis	3.49±0.06 ^b
Cooking	2.84±0.07 ^a

¹⁾ Mean±Standard error. Superscripts in a low indicated significantly difference at $p<0.05$ by Duncan's multiple comparison.

Table 7. Influence of relationship between major subject and business type of company or public organization

	Basic	Process	Law and Sanitation	Marketing	Analysis	Cooking
Manufacturing (general)	3.66±0.09 ^{1)ab}	3.69±0.11 ^{bc}	4.10±0.10 ^a	3.55±0.12 ^b	3.60±0.12 ^b	3.02±0.15 ^c
Manufacturing (functional)	3.96±0.10 ^{bc}	3.65±0.13 ^{bc}	3.98±0.11 ^a	3.67±0.10 ^{bc}	3.58±0.10 ^b	2.31±0.13 ^{ab}
Sale	3.52±0.12 ^{ab}	3.50±0.12 ^{bc}	3.98±0.10 ^a	3.73±0.12 ^{bc}	3.27±0.11 ^{ab}	2.67±0.16 ^{bc}
Catering	3.30±0.10 ^a	3.00±0.10 ^a	4.02±0.12 ^a	4.00±0.12 ^{bc}	2.89±0.14 ^a	3.83±0.13 ^d
Public health	4.28±0.09 ^c	3.96±0.14 ^c	3.76±0.18 ^a	2.56±0.16 ^a	4.56±0.13 ^c	2.36±0.15 ^{ab}
Others	3.63±0.26 ^{ab}	3.25±0.16 ^{ab}	4.00±0.33 ^a	4.13±0.23 ^c	3.75±0.25 ^b	2.00±0.27 ^a

¹⁾ Mean±Standard error. Superscripts in a low indicated significantly difference at $p<0.05$ by Duncan's multiple comparison.

subjects and analytical subjects as very important. Other industrial companies thought that food processing subjects were very important, except catering companies. Also, marketing subjects were considered to be very important for new businesses and food distributors. Therefore, in order to find a job within a catering company, one should concentrate his or her efforts on food related laws, hygiene, and marketing, while in order to find a job in a public organization, one should concentrate his or her efforts on analysis, basic principles, and food processes. From these results, the direction of college education programs for student recruiting should be considered.

5. Wage Premium for Food Sector Licenses

The wage premiums for food sectors licenses such as nutritionist, food engineering, cook, and sanitarian are shown in Tables 8 and 9. It was found that companies were ready to pay higher salaries to employees who have certain licenses. This result agrees with the specific influences on recruitment into companies or public organizations (Lee KG 2009). Furthermore, by the analysis of other food companies, catering companies were ready to pay higher salaries to those who have a nutrition license

Table 8. Wage premium of food sectors license for employees

Variables	Importance
Nutritionist	6.11±0.52 ^{b1)}
Food Engineer	6.78±0.47 ^b
Cooks	4.68±0.46 ^a
Sanitarians	4.65±0.44 ^a

¹⁾ Mean±Standard error. Superscripts in a low indicated significantly difference at $p<0.05$ by Duncan's multiple comparison.

Table 9. Effect of company type on wage premium of food sectors license for employees

	Dietitians	Food Engineer	Cooks	Sanitarians
Manufacturing (general)	3.79±0.39 ^{a1)}	6.38±0.47 ^a	3.97±0.39 ^{ab}	3.55±0.35 ^a
Manufacturing (functional)	3.25±0.37 ^a	6.78±0.42 ^a	1.88±0.27 ^{ab}	2.47±0.29 ^a
Sale	5.77±0.51 ^a	6.37±0.46 ^a	4.57±0.45 ^b	4.40±0.44 ^a
Catering	13.00±0.56 ^b	7.52±0.51 ^a	9.52±0.57 ^c	9.13±0.55 ^b
Public health	4.25±0.48 ^a	9.00±0.54 ^a	0.50±0.09 ^a	3.75±0.36 ^a

¹⁾ Mean±Standard error. Superscripts in a low indicated significantly difference at $p<0.05$ by Duncan's multiple comparison.

(Table 9). Whereas the business types of manufacturing, public organizations, and sales preferred to employ persons who had a food engineer license. Therefore, it is helpful for a person who has a food related license to attain a higher salary than someone without a food related license. Licensed food industrial engineers can also attain a higher salary than ordinary engineers.

CONCLUSION

This research investigated the mutual relationships between industrial and public requirements for qualified manpower and also studied the importance of academic programs while projecting the manpower requirements of food industrial areas. From the survey results, it was deemed most important to consider personality and character when recruiting employees. Professional food knowledge and computer handling ability were also highly considered. Food related laws and food hygiene were considered very important to both public organizations and food companies while public companies viewed principle subjects and analytical subjects very important. Also, it is helpful for a person who has a food related license to attain a higher salary than one who has no food relate license. Therefore, our results suggest that college academic programs are very important in the recruitment of students by companies or public organizations needing human resources.

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접 수 : 2012년 2월 16일
최종수정 : 2012년 3월 14일
채 택 : 2012년 3월 15일