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EXECUTIVE FEATURES AFFECTING THE CARING OF QUALITY ASSURANCE SYSTEMS*

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Abstract

The purpose of this study is to evaluate attitudes of managers at Food Industry Enterprises towards Quality Assurance Systems (QAS). Kruskal-Wallis test was used to analyze the hypotheses and results of the surveys conducted with the company officials. Age, position, level of education and experience play a role in enterprises' caring QAS, according to results of the analysis. Considering mean rank of level of education, university graduates with a mean rank of 64.58 have a more positive attitude than graduates of high school and secondary school towards the factor that QAS increases productivity and reduces customer complaints. It was also determined that company officials at the age of 20-29 considering age factor, managers with an experience of 15 years and over considering experience factor and enterprise directors considering position factor have a more positive attitudes compared to other groups. It is possible to state that young managers with little experience have a positive attitude towards the factor that QAS gives the enterprise an opportunity to compete.

Keywords: Food Safety, Food Enterprises, Quality Assurance Systems, Kruskal-Wallis.

1. INTRODUCTION

Food industry is a branch of industry that uses agricultural raw materials and applies various techniques of preparation, processing, storing and packing on the material thus making them more durable and ready for consumption. Food industry provides an assurance for an increase in the agricultural production and forms a basis for a balanced nutrition, which are two significant functions of it (Yulafçı and Cinemre, 2005). In food industry, pathogenic microorganisms contaminate the food due to unhygienic practices in the stages of harvest, preparation, processing and packing, which then leads to diseases caused by food (Ertürk, 2009). Food borne diseases are often caused by organisms invisible to the naked eye such as bacteria, yeast, mould and viruses. Research shows that food borne diseases are more widespread in developing countries when compared to developed countries (Demirci, 2002)

Damages caused by food result largely from insanitary food production. The food which goes through such a production harms people's health by chemical materials such as pathogenic microorganisms, excessive pesticide residue or hormone as a result of contaminating physical materials like glass, bone and stone (Tamer et. al., 2004).

There are two issues discussed in the world related to nutrition, which are food security and food safety. Food security, defined as people's accessing enough and healthy food to maintain a healthy life and continue their activities at all times, includes concepts of supplying, accessing and consuming the food. Food safety, on the other hand, is defined as raw material procurement and taking necessary precautions in the stages of production, processing, storing, transportation, distribution and presentation of the food in order to ensure secure food production. Starting point of food safety is the farm and final point is the consumer. Food safety therefore includes all the stages from field to fork, which are healthy raw material supply and production, processing, storage, transportation, distribution and storage of food (Giray and Soysal, 2007).

Food safety can be ensured by managing rings of a chain that links the raw material supplier to the customer in a way that it does not pose any physical, chemical and microbiological risks to human life (Veral, 2004).

Food safety is considered as an obligation and an international standard not only in developed countries but in the whole world and regarded as a priority in many countries in order to achieve goals like decrease in product cost, increase in productivity and enhancing export and import (Türksoy and Altıniğne, 2008). Firms in the food sector must make enough production and provide marketing and sale to serve this purpose as a part of their moral and legal responsibilities (Özçırpıcı et. al., 2009).

Food safety, regarding food that has become a thread to human health in today's global food market, is an issue to be dealt with internationally accepted food security systems. General responsibility for food

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safety should be shared by all components of food-drink system including various industry sectors, state regulatory authorities and consumers. Contamination risk in food supply could be a thread to human health, cause high cost for suppliers and affect food trade as well (Badrie et. al., 2007).

Agreements of Sanitary and Phytosanitary Measures (SPS) and Technical Barriers to Trade (TBT), carried out by Word Trade Organization (WTO), of which Turkey is a member, have obliged member countries to develop special control systems and tried to clarify the rules for the trade of quality, safe and environment-friendly products (Karaali, 2003).

Under present conditions, it is a must to involve quality management system in food establishments. ISO 9000 series of standards have been developed in order to establish quality management. In this way, a series of measures and suggestions related to cold-chain and storage have been developed under the title of HACCP in the stages of production and distribution. Introduction of quality assurance system concept has therefore been ensured in international food trade and market in terms of certification of food establishments and their compliance with the terms (Erkan et. al., 2008).

Codex Alimentarius Commission (CAC), Food and Agriculture Organization (FAO) and World Health Organization (WHO) approved food control systems that have been developed based on HACCP in terms of technique, regulations and science, with the purpose of eliminating several food safety practices that could impede international food trade. Use of HACCP (ISO 22000) and ISO 9000 series of quality management system standards complementary to each other stands out as the core strategy (Topoyan, 2003).

ISO 22000 is the first series of international standards prepared by ISO and published under the title of "Food Safety Management System" in September, 2015.Internationally recognized TS EN ISO 22000 Standard of Food Safety Management was published in Turkey instead of Standard of TS 13001 HACCP (Asoğlu et al., 2014). TS EN ISO 22000 Standard of Food Safety Management Systems was recognized by CEN and prepared in the light of EN ISO 22000-2005 series of standards and then was made available to those concerned following its publication as Turkish Standard on April 24, 2006 (Büyükhelvacıgil, 2009;2).

When TS EN ISO 22000 conditions have been fulfilled, the terms of HACCP and thus regulatory requirements will also be met (Kahvecioğlu and Özen, 2008).

2. MATERIAL AND METHOD

2.1. Material

The research area is composed of food industry enterprises located in Sanlıurfa. Research material was obtained through primary and secondary data sources. It was determined that there were a total of 184 food industry enterprises which received a capacity report from Chambers of Industry and Commerce located in Sanlıurfa. Primary data of the research consists of the information obtained through a face-to-face survey with managers and/or owners of 118 enterprises (complete count) out of all. Secondary data was obtained through the records of Turkish Standards Institute and other institutions and organizations and related publications.

2.2. Method

A certain database was created for the information obtained depending on primary and secondary data and a general coding scheme was prepared and then transferred to Excel environment. The results were interpreted through Kruskal-Wallis test.

3. FINDINGS

Chart 1: Converted Factor Model Matrix

Questions	Factors					
	1	2	3	4	5	6
Q28	**0.855**	0.341	0.178	0.013	0.082	-0.015
Q25	**0.854**	0.291	0.139	0.042	0.119	0.112
Q26	**0.838**	0.319	0.124	0.041	0.167	0.136
Q29	**0.795**	0.345	0.091	0.025	0.171	-0.078
Q34	**0.777**	0.490	0.189	0.032	0.122	0.033
Q27	**0.648**	0.441	0.107	0.225	0.122	-0.129
Q31	**0.533**	0.299	0.271	0.111	-0.092	-0.269
Q22	0.367	**0.802**	0.030	0.110	0.059	-0.012
Q24	0.312	**0.787**	0.134	0.179	-0.156	0.016
Q30	0.424	**0.772**	0.072	0.133	-0.034	-0.110
Q35	0.279	**0.763**	-0.036	-0.026	0.143	0.075
Q33	0.310	**0.742**	0.106	0.158	0.123	0.042
Q38	0.431	**0.604**	0.040	-0.143	0.273	0.234
Q40	0.176	0.060	**0.936**	-0.014	-0.016	0.122
Q39	0.111	0.032	**0.909**	0.076	0.002	0.022
Q48	0.174	0.084	**0.852**	-0.021	0.159	0.053
Q45	0.116	0.097	-0.008	**0.908**	0.040	0.106
Q47	-0.003	0.319	0.090	**0.555**	0.502	0.114

Q41	0.333	0.027	0.090	0.091	**0.830**	-0.022
Q46	-0.002	0.067	0.179	0.163	0.005	**0.924**

Hypotheses developed according to the results in Chart 1 and the questions used in the development of the hypotheses are defined as follows.

Factor 1 QAS increases quality and productivity; helps to reduce rate of wastage and customer complaints
Q25-Possessing QAS spruces up quality system.
Q26-Possessing QAS improves physical conditions of working environment.
Q27-Possessing QAS reduces customer complaints..
Q28-Possessing QAS helps to correct the errors in the production.
Q29-Possessing QAS allows a more efficient use of the resources.
Q31-Posessing QAS reduces the rate of wastage in the production.
Q34-Possessing QAS provides an increase in production and service quality.

Factor 2 QAS helps to build trust in the company and to have advantages in sales and competition
Q22-Possessing QAS increases sales.
Q24-Possessing QAS improves company's competitiveness.
Q30-Possessing QAS helps to increase rate of return.
Q33-Possessing QAS provides an increased confidence in the company.
Q35-Posessing QAS is a necessity to increase the power of the company.
Q38-The return of possessing QAS is more than its cost.

Factor 3 I follows publications about QAS
Q39-I have information about QAS.
Q40-I read QAS regulations and etc.
Q48- I follow legislations, amendments, publications and news related to Food Safety and Quality.

Factor 4 Companies care Food Safety and informs their customers about it.
Q45-Food companies sufficiently inform their customers about food Safety and quality.
Q47-The importance given to food safety and quality in companies is sufficient.

Factor 5 ISO 22000(HACCP) is sufficient to ensure food safety.
Q41- ISO 22000(HACCP) is sufficient to ensure food safety.

Factor 6 Food companies have enough economic potential to get quality certificates.
Q46- Food companies have enough economic potential to get quality certificates

Results of Kruskal-Wallis applied to test research hypotheses are as follows.

Chart 2: Kruskal-Wallis Test Results related to the Factors that QAS Increases Productivity and Quality, and Reduces Rate of Wastage and Customer Complaints

	Groups	N	Mean Rank
Age			
	20-29	24	67.25
	30-39	47	54.46
	40-49	43	61.43
	50 and over	4	51.50
Position			
	Company manager	69	65.01
	Company owner	33	50.05
	Other	16	55.25
Level of Education			
	Primary School	26	56.04
	Secondary School	19	70.47
	High School	34	50.19
	University	39	64.58
Experience			
	1-4	53	58.09
	5-9	40	60.61
	10-14	12	51.79
	15 and over	12	64.83

Test Statistics

	Age	**Position**	**Level of Education**	**Experience**
Chi-square	2.609	4.556	5.598	1.025
df	3	2	3	3
p value	0.456	0.102	0.133	0.795

Variables of age, position, levels of education and experience differ with a significance level of 0.05 for the agreement on the factor in Chart 2 that "QAS improves productivity and quality, it reduces rate of wastage and customers complaints"; and significance levels of education and position factors were found to be similar. It was determined that university graduates with a mean rank of 64.58 have a more positive attitude when compared to graduates of primary school and high school. It was also determined that company officials at the age of 20-29 considering age factor, managers with an experience of 15 and more years considering experience factor, and company managers considering position factor have more positive attitudes when compared to other groups. According to these results, it is possible to say that university graduated, young, business manager and experienced managers increase the product quality of Quality Assurance System, decrease the rate of waste and reduce the complaints of customers comparing to other authorized ones.

Chart 3: Kruskal-Wallis Test Results related to the Factor that QAS Helps to Build Trust in the Company and to Have Advantages in Sales and Competition

Groups		N	Mean Rank
Age			
	20-29	24	68.42
	30-39	47	59.67
	40-49	43	54.43
	50 and over	4	58.50
Position			
	Company manager	69	66.89
	Company owner	33	49.56
	Other	16	48.13
Level of Education			
	Primary School	26	61.00
	Secondary School	19	61.53
	High School	34	50.43
	University	39	65.42
Experience			
	1-4	53	68.83
	5-9	40	52.31
	10-14	12	48.88
	15 and over	12	48.00

Test Statistics

	Age	**Position**	**Education**	**Experience**
Chi-square	2.580	7.777	3.678	8.338
df	3	2	3	3
p value	0.461	0.020	0.298	0.040

In chart 3, agreement on the factor that "QAS helps to build trust in the company and to have advantages in sales and competition" differs with a 0.05 level of significance in the subgroups of the variables position (0.020<0.05) and experience (0.040<0.05). According to the mean ranks related to these variables, company managers in position variable (mean rank: 66.89) have a more positive attitude towards the factor compared to company owners (mean rank: 49.56) and other (mean rank: 48.13). When it comes to the variable of experience, those with an experience of 1-4 years (mean rank: 68.83) have a more positive attitude towards the factor compared to those with an experience of 5-9 years (mean rank: 52.13), of 10-14 years (mean rank: 48.88) and of 15 years and over (mean rank: 48.00). Attitudes toward the factor get more positive by experience regarding mean ranks of experience. Considering age variable, those at the age of 20-29 (mean rank: 68.42) have a more positive attitude towards the factors than those with other age groups; however, this is not statistically significant. Comparing the business manager to the business owners, young managers to old ones and experienced managers to inexperienced ones, it is possible to claim that they are more obtimistic about the issue of providing competition and sales advantages to Qaulity Assurance Systems.

Chart 4: Kruskal-Wallis Test Results related to the Factor that I follow publications on QAS

	Groups	N	Mean Rank
Age			
	20-29	24	58.21
	30-39	47	62.84
	40-49	43	54.97
	50 and over	4	76.75
Position			
	Company manager	69	64.40
	Company owner	33	50.71

	Other	16	56.50
Level of Education			
	Primary School	26	39.15
	Secondary School	19	65.89
	High School	34	49.43
	University	39	78.73
Experience			
	1-4	53	66.92
	5-9	40	52.94
	10-14	12	61.04
	15 and over	12	42.17

Test Statistics

	Age	**Position**	**Education**	**Experience**
Chi-square	2.255	3.716	25.136	7.170
df	3	2	3	3
p value	0.521	0.156	0.000	0.067

Agreement on the factor in Chart 4 that "I follow publications on QAS" varies in subgroups of education variable with a significance level of 0.05. According to the mean ranks related to the subgroups, university graduates (mean rank: 78.73) have a more positive attitude towards the factor when compared to graduates of primary school (mean rank: 39.15), secondary school (65.89) and high school (mean rank: 49.43).

It is possible to state that variable of experience is close to the significance level of 0.05 in the test results. According to the mean ranks related to this variable, those with an experience of 1-4 years (mean rank: 66.92) have a more positive attitude towards the factor compared to those with an experience of 5-9 years (mean rank: 52.94), those with an experience of 10-14 years (mean rank: 61.04) and those with an experience of 15 years and over (mean rank: 42.17). It is observed that university graduated, 50 years and older, experienced managers follow more in rate the publications about the Quality Assurance Systems comparing to the others.

Chart 5: Kruskal-Wallis Test Results related to the Factor that Companies Care Food Safety and Inform Their Customers about It

	Groups	N	Mean Rank
Age			
	20-29	24	59.38
	30-39	47	61.01
	40-49	43	56.27
	50 and over	4	77.25
Position			
	Company manager	69	57.37
	Company owner	33	63.86
	Other	16	59.69
Level of Education			
	Primary School	26	68.65
	Secondary School	19	62.37
	High School	34	55.69
	University	39	55.32
Experience			
	1-4	53	57.47
	5-9	40	61.56
	10-14	12	57.29
	15 and over	12	58.92

Test Statistics

	Age	**Position**	**Education**	**Experience**
Chi-square	1.553	0.805	2.999	0.366
df	3	2	3	3
p value	0.406	0.669	0.392	0.947

Variables of age, position, levels of education and experience in Chart 5 do not differ with a significance level of 0.05 for the factor that companies care food safety and inform their customers about it. Although the tests do not give a significant result, those at the age of 50 and over (mean rank: 77.25) have a more positive attitude towards the factor than those in the other age groups. It is possible to say that old (50 and older) managers are more obtimist about informing their customers and give more importance to food security of Quality Assurance Systems comparing to primary school graduate managers and business owners.

Chart 6: Kruskal-Wallis Test Results related to the Factor that ISO 22000(HACCP) is Sufficient to Ensure Food Safety

	Groups	N	Mean Rank
Age			
	20-29		60.25
	30-39		54.46
	40-49		65.69
	50 and over		47.75
Position			
	Company manager		59.05
	Company owner		63.83
	Other		52.50
Level of Education			
	Primary School		70.00
	Secondary School		66.58
	High School		56.43
	University		51.73
Experience			
	1-4		56.47
	5-9		58.99
	10-14		69.54
	15 and over		59.67

Test Statistics

	Age	**Position**	**Education**	**Experience**
Chi-square	2.580	1.211	5.550	1.458
df	3	2	3	3
p value	0.461	0.546	0.136	0.692

Variables of age, position, levels of education and experience in Chart 6 do not differ with a significance level of 0.05 for the factor that ISO 22000(HACCP) is sufficient to ensure food safety. It is possible to say that managers or business owners are not obtimist about their efficiency of providing food security of ISO 22000 according to variables of their age, duty, education and experiences.

Chart 7: Kruskal-Wallis Test Results related to the Factor that Food Companies Have Enough Economic Potential to Get Quality Certificates

	Groups	N	Mean Rank
Age			
	20-29	24	67.58
	30-39	47	64.44
	40-49	43	51.80
	50 and over	4	35.75
Position			
	Company manager	69	63.98
	Company owner	33	53.68
	Other	16	52.19
Level of Education			
	Primary School	26	55.69
	Secondary School	19	66.42
	High School	34	64.49
	University	39	54.32
Experience			
	1-4	53	61.81
	5-9	40	64.81
	10-14	12	43.21
	15 and over	12	43.00

Test Statistics

	Age	**Position**	**Education**	**Experience**
Chi-square	6.424	2.868	2.716	6.810
df	3	2	3	3
p value	0.093	0.238	0.437	0.078

Variables of age, position, levels of education and experience in Chart 7 do not differ with a significance level of 0.05 for the factor that "food companies have enough economic potential to get quality certificates

Although the results do not provide significant results, those at the age of 20-29 (men rank: 67.58) have a more positive attitude towards the factor compared to those at the age of 50 and over (mean rank: 35.75).

Considering the variable of experience, those with an experience of 1-4 years (mean rank: 61.81) and of 5-9 years (mean rank: 64.81) have a more positive attitude towards this factor compared to those with an experience of 10-14 years (mean rank: 43.21) and those with an experience of 15 years and over (mean rank:43.00). It is possible to state that young company officials with little experience have the opinion that food companies have enough economic potential to get quality certificates.

4. RESULTS

Age, position, levels of education and experience of the participants do not differ with a significance level of 0.05 for the agreement on the factor in Chart 2 that "QAS improves productivity and quality, it reduces rate of wastage and customers complaints" and significance levels of education and position factors were found to be similar. University and secondary school graduates have a more positive attitude towards the factor.

Agreement on the factor that "QAS helps to build trust in the company and to have advantages in sales and competition" differs with a 0.05 level of significance in the subgroups of the variables position (0.020<0.05) and experience (0.040<0.05). It is possible to state that young company managers with little experience have a more positive attitude towards the fact that QAS certificates build trust in the company and provide an opportunity for competition and sales.

Agreement on the factor in Chart 4 that "I follow publications on QAS" varies in subgroups of education variable with a significance level of 0.05. According to the mean ranks related to the subgroups, it is possible to state that university graduates (mean rank:78.73) follow the publications on QAS more than graduates of primary school (mean rank:39.15), secondary school (65.89) and high school (mean rank:49.43). Variables of age, position, levels of education and experience in Chart 5 do not differ with a significance level of 0.05. for the factor that " Companies care food safety and inform their customers about it".

Variables of age, position, levels of education and experience in Chart 6 do not differ with a significance level of 0.05 for the factor that ISO 22000(HACCP) is sufficient to ensure food safety.

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