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The food safety perception in Turkey: gender variation

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Abstract

The main aim of this study is to determine the level of consciousness of the people who are involved in agricultural activities about food safety and quality. The current study also aims to understand the difference of approaches by different sexes while displaying their perception of food safety and healthy nourishment concerning the consumer choices. The perceptions about food safety in a random sample of 800 different households from rural Turkey which are involved in economic activity both as consumers and producers, was determined and the responsibilities of woman and man in food production were displayed. Besides, information on socio-demographic characteristics of the households was given. The evaluations were performed on the data obtained from 1590 questionnaires answered by a man and a woman in each of a total of 795 household. Some differences were identified between men and women regarding the perception of food safety. The idea that hormones and residues cause harm dominates both groups' thoughts. In addition, they denoted that the chemical boxes and packaging should be evaluated as threats to food safety. Willingness of the women to participate in the courses that would be given in their locations was high, while their partners' sensitivity to these courses was low. Some nutrition knowledge was mis-established, and it was determined that, due to the commitment to traditions, in some of the families difficulties may arise in changing the customs.

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Keywords: food safety; rural women; gender; Turkey; green revolution; food production.

Introduction

The necessity for an increase in food supply in the last century has developed some original techniques in agriculture and initiated a period of “green revolution”. However, the increase in food supply has raised chemical usage; the soil has suffered fertility as the limits of arable area have been reached and quite a few vegetal diseases emerged, and hence this has caused a vicious circle (Dölekođlu, 2003). Since mid-20th century the problems of residues on foods and their negative effects have come to the fore. However the precautions were taken only towards the end of 20th century due to the increases in food borne diseases and the consciousness about the risks. As a new concept food safety took its place in the literature in this period. Food safety is the compliance to the rule of thumb standards in terms of the ingredients, packing and distribution to the consumer. Food safety encompasses the precautions against all kinds of health hazards caused by foods directly or indirectly and this requires the fundamental provision of being far from any kind of contamination, adulteration, toxins and so on together with fraud and spoilage (Giray et. al., 2006). Parallel to the developments experienced in recent years, the consumers desire to consume safer foods. Therefore the governments are in pursuit of the provision and supervision of these via the laws. In this process the producers are gradually recognizing their responsibilities. Yet the problems of food safety still increases despite the regulations and precautions. Many threats ranging from microbial pesticides to anti-microbial residuals still last (Olson and Slack, 2006).

The fields of food safety and quality are complicated and multi-dimensional. The food safety and quality have economic, social, cultural, environmental and political consequences and they are related not only to the first step of agricultural production but also to production site, animal health, storage conditions, marketing, hygiene conditions and regulations, consumer awareness, food habits and new technologies such as genetically modified products. At the same time the relationship between social actors and the policies, social and cultural differences are quite closely related to the concepts of food safety and quality. Therefore, the nations should take an integrated stand for food safety and quality that takes gender issues into consideration and that is participatory (FAO, 2004). Following a participatory approach depends on the realisation of studies that reveal gender differences and roles. The determination of the gender perspective necessitates the analyses of the responsibilities and roles of women and men in the production system. Women and men play different roles based on the socio-economic charac-

teristics of the nation and agricultural structure. These roles may differ even between the regions. As usual the food perceptions of women and men differ (Wilcock et al. 2004; Tucker et al. 2006; Leikas et al., 2007; Sanlyer and Karakus, 2010) and the food production has a gender. Therefore gender differences could not be ignored in those studies on food safety and quality (Breakwell, 2000; Sisto, 2007; Meinzen-Dick et al, 2011).

Even women are involved at each and every part of life in recent years. They maintain their importance in the agricultural sector. Women employed in agricultural sector constitute approximately one fourth of the world population. In the last 50 years the role of women in agricultural sector has become more important. While in 1950s about 40% of the activities in agricultural enterprises were realised by women, today the ratio is around 50% (www.fao.org). Half of the world food production is under the responsibility of women. Particularly those women living in rural areas are responsible for half of the world food production and in developing countries 60-80% of foods are produced by women. 80-90% of agricultural production in Sub-Saharan Africa, 50-60% in Asia, 46% in Caribbean and 30% in Latin America is done by women (www.bwni.com). In Turkey women constitute 45.3% of the population aged 15Å whose core business is agricultural activities. The women employment ratio in non-agricultural activities is 20.9% (www.tuik.gov.tr). Despite their contributions to global food safety female peasants are usually ignored in development strategies (www.fao.org/gender and food securities statistics).

Women are unpaid family workers who work at home and deal with the development of family members. The roles and existence of women were recognised by social scientists only 30 years ago and then they became the subject of scientific studies. Especially the ignorance of women in development programs in the third world had destructive economic and social results and these problems experienced had featured the roles of women (Darque and Gasson, 1991). Based on the interviews made with men before a project to be realised in the forest villages in Thailand 3,000 hardwoods seedlings were planted but most of them rotted. In these villages the individuals who are responsible for saddling and household maintenances are women and they prefer softwoods for using as firewood. The ignorance of women's views in the choice of hardwood has caused the project to be unsuccessful. In the second phase by planting both hard and soft wood seedlings the necessities of both women and men are satisfied. Similarly an introduction of new type of rice is done to men where most of the rice production is performed by women and that year rice production could not be made (Deda and Rubain, 2004).

Women have also the knowledge of the utilisation and assessment of genetic sources in the sectors of food and agriculture. In the sub-regions of Africa, 120 different types of plants are grown by women. Women play roles in the development and maintenance of seed banks in Bolivia, Columbia and Peru (farmers'

world network briefing). Especially cultural knowledge on medical and aromatic foods is in women's hands and in many countries women earn their livings.

While the responsibilities of women living in rural areas, particularly in developing countries, are increasing, women are still living as the most disadvantaged group in the society. The increase in health problems and the employment demand in the cities increase the population of women in rural area and their responsibilities. Although the roles of women especially in low-income countries, agriculture is perceived under the control of male population. Therefore women are still disadvantaged in terms of property, borrowing, technology utilisation, utilising publishing and education opportunities. Traditional heritage perception limits the land possession and their utilisation by women in many developing countries. In 6.5% of the total agricultural enterprises in Turkey women are ranked as self-employed household in the statistics (www.tuik.gov.tr). Those women having lands in India, Nepal and Thailand are less than 10% (www.fao.org). Samples reveal that the developments in the possession of women have positive reflections. Those farm owner women who started to work with the tax incentive of the EU form 1990s on have succeeded in production base utilisation and production methods. They led many developments in rural tourism, the introduction and marketing of food, organic agriculture and original production development (FAO, 2004).

Gender expresses the responsibilities of women and men that are socially determined. The concept of gender does not cover biological differences but instead it covers how society sees, perceives, thinks individuals as women and men and what kind of behaviours are expected from them (Akýn and Demirel, 2003). In traditional societies gender roles are limited with sharper lines. In rural areas also, except for other social classes, the behaviours expected from women differ from region to region, and some different responsibilities are given to women. At the head of these responsibilities is to participate in agricultural activities. Besides, some other roles are identified for women. The determination of the roles of women in rural areas reveals the data that is primarily crucial in the formation of rural development policies and in the preparation of projects.

With the study, the exposure of the level of awareness and the perception of women who have important roles in agricultural activities about food safety and the determination of the perception differences of them with males are aimed. In addition, healthy production and the interpretation of gender differences in food preparation are also aimed. It is thought that the findings of the study would contribute to the preparation of distinct programs for women and men in the agricultural education and publication activities related to food safety.

Methodology

As the fundamental aim of the study is to analyse food safety in terms of gender, the target population of the study is the women whose core activity is agriculture and who are 15+ years old. Therefore in the sample is based on the ratio of women aged 15+ and the determined sample is distributed geographically. Furthermore, in order to realise a comparative analyses of the thoughts and attitudes of women and men, an interview is performed with a man (usually the husband of the woman who is the head of the family) as well as a woman who is randomly determined from each household.

In the study the size of the sample that would represent the population is determined to be 800. In order to understand how well the sample represents the population error margin is calculated. When the data for the population exists and the population is larger than 100,000 (according to 2001 General Agricultural Census there are 3,408,050 women whose core activity is agriculture and who are 15+ years old) the aforementioned error margin is calculated in a certain confidence interval with the following formula (Laajimi and Briz, 1992, cited in Sengül et. al., 1998).

$$n = \frac{Z^2 \times p \times q}{e^2} \quad (1)$$

p: the probability of the unit investigated (female population) to be in the population (In the study, in order to attain maximum sample size of the population and as there are no similar study previously made, this ratio is accepted as 50%).

n: 800

q: 1-p

e: error term

t: confidence interval

p: 0.50

q: 0.50

Z: %95 (the table value for %95 confidence interval = 1.96)

Error margin according to Formula 1 is determined to be as follows:

$$e = \frac{\sqrt{Z^2 \times p \times q}}{n}$$

$$e = \frac{\sqrt{1,962^2 \times 0,50 \times 0,50}}{800}$$

e = 0.0346

Accordingly, it is precipitated that the sample chosen would represent the population with a probability of 95% and a maximum error margin of 3.46%. The regional distribution of the sample size is done through the following phases. The information about the regional distribution of the questionnaires applied on 800 women and 800 men chosen form 800 households is presented in Table 1.

Table 1. *Regional distribution of sample size.*

Regions	Target female population aged 15+		Number of households	Provinces	Number of questionnaires
	Number	%			
1 Aegean	546,453	16.3	131	Manisa - İzmir	82+49
2 Marmara	263,293	7.9	63	Sakarya-Bursa	35+28
3 Mediterranean	341,330	10.2	82	Mersin - Antalya	43+39
4 North East	238,344	7.1	56	Erzurum - Kars	36+20
5 South East	323,309	9.7	77	Diyarbakır - Ş.Urfa	36+41
6 Black Sea	667,196	19.9	160	Samsun - Ordu	95+65
7 Central East	331,491	9.9	79	Malatya - Adıyaman	41+38
8 Central North	382,150	11.4	91	Çorum- Kütahya	50+41
9 Central South	253,699	7.6	61	Konya - Afyon	35+26
Total	3,347,265	100.0	800		800

Turkey is geographically, agriculturally, statistically (NUTS) and strategically divided into different regions. In accordance to the aim and subject of the project in the sample 9 agricultural regions are taken into consideration and the women population whose core activity is agriculture, and who are 15+ years old and living in these regions is determined according to the 2001 Agriculture Census of TurkStat. The per-agricultural region-questionnaire figure is determined according to the ration of female population living in the region. In each province in the region, the weights of rural female population, that is the population, are calculated and 2 provinces having the largest weights are selected as the representative provinces. The number of questionnaires to be performed in these provinces is determined through the weights of these provinces in the selected provinces in terms of rural female population. The villages to be surveyed in each province are determined randomly. Familial and individual socio-demographic information is obtained from the sample group. Besides in order to measure perception differences in terms of perception safety and to determine the factors, foods safety, life-style and innovativeness attitudes related assessments are compiled through three point Likert attitude scale. The aforementioned women-men differences are

examined. The data is evaluated via factor analysis. Factor analysis, one of the multi-variable statistical analyses, is used for examining the relationship among various variables and for determining whether the variables can be summarised with less factors or components. Factor analysis is usually applied for samples having 50+ observations. Having a sample size of 100 or more is preferable. As a rule of thumb, the number of observations should be four or five times more than the variables to be analysed (Joseph et. al., 1992).

The mathematical model of the factor analysis shown in Equation 2 appears to be quite similar to a multiple regression. Each variable is expressed as the linear combination of non-observable factors.

$$X_i = A_{i1}F_1 + A_{i2}F_2 + \dots + A_{ik}F_k + U_i \quad (2)$$

In the equality above F, U and A denote general factors, unique factor and the constant combining k factors, respectively.

It is assumed that there is no correlation among unique factors, and between unique factors and general factors.

Factors are obtained from observed variables and can be estimated as the linear components of them. The general estimation equation of the jth factor, F_j, can be expressed as follows:

$$F_j = \sum_{i=1}^p [W_{ji} X_i + W_{j2} X_2 + \dots + W_{jp} X_p] \quad (3)$$

W_i and P denote factor score coefficients and the number of variables, respectively (Norusis, 1988).

W_i and P denote factor score coefficients and the number of variables, respectively (Norusis, 1988).

There are various methods for unfolding the factors in the analysis. In the study, the most common method, namely the principal components analysis, is utilised. The analysis is based upon the transformation of the variable set having inter-correlation to the viable set having no inter-correlation. There is no correlation among the components and the first component has the largest variation. Components receive decreasingly less share from total variation.

In order the variables to be represented accurately, the number of factors is determined through a few criterions. The first of them is the determination of how much each factor explains the total variance. Another criterion is that all the factors chosen before the rotation have a variance at least equal to the average variance of at least one variable.

In the determination of the number of adequate factors, Eigen value and scree plot are utilised. As a general rule the factors having an Eigen value over 1 are selected. In the scree plot, the number of factors coincides with the break point at the scree plots of total variances of each factors is accepted to be adequate.

Once the number of factors is determined the rotation technique is applied. The rotation technique is the simplification of rows and columns in order to ease the interpretation. In the rotation technique orthogonal and oblique methods are utilised. In the study, the varimax rotation solution that is the orthogonal technique is utilised.

Findings and Discussion

Some General Characteristics of Households

In the study information is obtained from people surveyed about themselves and the households. The fundamental defining characteristics of those households included in the study are presented in Table 2.

Table 2. *Some socio-demographical indicators of families in the regions surveyed*

Regions	Household amplitude	Age of mother	Age of father	Education of mother (year)	Mother school enrolment (%)	Education of father (year)	Existence of social security	
							Frequency	%
Aegean	3.7	43.3	47.2	5.5	89.3	5.8	98	74.8
Marmara	4.8	44.2	48.9	5.2	89.1	5.4	54	84.4
Mediterranean	3.8	44.4	47.4	5.3	68.7	5.8	63	75.9
North East	6.0	39.3	43.2	5.1	43.6	6.0	34	61.8
South East	7.7	35.5	40.5	-	-	4.8	56	72.7
Black Sea	4.4	45.1	48.1	5.4	67.1	5.6	104	64.6
Central East	5.8	44.4	49.5	6.2	18.1	6.6	55	76.4
Central North	3.8	47.0	50.5	5.5	52.7	7.0	76	81.7
Central South	4.2	48.4	51.9	5.2	63.0	5.9	52	88.1
Average/Total	4.7	43.7	47.6	5.4	58.1	5.9	592	74.5

In the survey average household size is found to be 4.7. According to 2000 census rural household size is 5.2. In North-eastern, South-eastern and Central-eastern regions extended family structure is observed; besides in these regions traditional life-style mostly lasts and the income level is lower than the ones in other regions. Also the per capita gross value added in these regions is behind the other regions. In 2010, the per capita gross value added creation is 4,171TL in Southeast Anatolia Region, 3,867 TL in Northeast and 5,340 TL in Central-east (TÜYK, 2010). The average ages of women and men in the study are 43.7 and 47.6, respectively.

As in most of the developing countries the schooling ratio among adult women, especially in rural areas, is quite low in Turkey. However, recently, owing to the campaigns organised by NGOs and public-private sector cooperation the schooling rate among girls and owing to the courses organised for adults the literacy rate have increased conspicuously. In the study the average schooling is found to be 5.4 and 5.9 for women and men, respectively. However, the rate of formal education among women is quite low (58.1%). Especially Central-eastern, North-eastern and Central-northern regions are below the average. While the literacy rate among 15+ women is 73% as of 2005 (World Bank, Genderstat Database), it is 80.3% in Turkey (www.tuýk.gov.tr); and 73% in rural areas (Uzunöz et. al., 2008). The same rate is 99% in developed countries and 69% in the developing world (EFA Global Monitoring Report, 2005). The socio-economic factors in Turkey directly affect the educational background of women. According to Acar (2003) the schooling of girls among low-income families is 76.5% while it is 96.4% among high-income families. In the same study the reasons of non-scholing are ranked as cost (21.9%), lack of school (11.5%), the need for housework (10.2%) and disallowance by the family (8%). Children's level of education decreases because they begin working at a very early age (Acar, 2003).

One of the most crucial deficiencies experienced in rural areas is the inadequacy of social security. 57.5% of the families encompassed in the survey are registered in the Social Security Institution (SSI). While the rate of SSI registered families in Central-southern (84.8%) and Marmara (84.4%) Regions are high, in the South-eastern Region the rate is 9.1%. Approximately 17% of the families have green card⁵ in order to utilise only the health services. With a share of 63.6%, the highest green card possession is in the South-eastern Region (Dölekođlu and Gün, 2011).

Food Security Perception

In order to assess the perceptions of the producers surveyed on food safety 3 point Likert Perception Scale is applied. Some expressions related to food safety are presented to the surveyed people and they are asked if they agree or not. Together with the fundamental desire to examine the food safety perception in the study, some questions about their attitudes to life and settlement, and innovativeness are asked to the attendees in order to interpret the gender differences in healthy production and food preparation. These questions are also prepared in 3 point attitude scale format.

The producer attitudes are classified as "Food Safety related Attitudes", "Lifestyle related Attitudes" and "Innovativeness related Attitudes" (Table 3). Average value is attained by multiplying each answer given for the attitudes with the scale

⁵ Health coverage temporarily assigned for the treatment costs of those citizens having no social insurance and no ability to pay, to be covered by the government.

value and this value is interpreted together with the expressions in the perception scale. Although there seems no crucial difference between genders in the third classification, the differences at the sub-titles are remarkable. The level of food safety consciousness is determined to be fair average and the perspective of men is more positive than the women's. Compared to women men are more open to innovations.

Table 3. *Opinions on food safety in production and consumption*

Attitudes	Women					Men				
	1	2	3	Avg.	Std. D.	1	2	3	Avg.	Std. D.
Food Related Attitudes				1.82					1.75	
1. All the products sold in the supermarkets are reliable.	171	218	390	2.28	0.83	163	150	458	2.38	0.84
2. Broken or cracked eggs cannot be consumed.	582	36	171	1.48	0.85	589	41	147	1.43	0.87
3. The canned foods bended cannot be consumed.	492	51	215	1.63	0.94	502	66	200	1.61	0.90
4. Malted potatoes are harmful.	454	62	270	1.77	0.95	464	59	245	1.71	0.99
5. Boiled milk spoils.	223	98	453	2.30	0.91	245	90	434	2.25	0.94
6. I believe that food health and safety are not adequate promoted on media.	391	218	149	1.68	0.84	448	194	128	1.58	0.80
7. The increase in fertilizer utilization would not enhance productivity.	161	88	531	2.47	0.83	318	98	358	2.05	0.97
8. Irrigation through sewage harms both the plant and the human.	579	28	176	1.49	0.88	581	47	142	1.43	0.89
9. Over-irrigation harms the soil.	623	68	93	1.32	0.69	630	51	94	1.31	0.70
Life Style Related Attitudes				1.73					1.63	
1. I believe I eat healthily.	592	119	80	1.35	0.66	470	173	133	1.57	0.79
2. I would like to live in a village.	436	90	260	1.78	0.94	435	76	265	1.78	0.97
3. I do not my children to be engaged in agriculture.	561	86	140	1.47	0.81	580	66	131	1.42	0.85
4. I would like to work in a non-agricultural sector.	279	96	403	2.16	0.96	426	98	241	1.76	1.00
5. I wish I had more education.	733	26	31	1.11	0.43	733	24	21	1.08	0.39
6. I like to be lively and quick.	500	188	101	1.49	0.72	464	219	89	1.51	0.73
7. I am always up to date.	201	236	353	2.19	0.83	354	287	135	1.72	0.78
8. I am fond of my freedom.	416	272	101	1.60	0.71	535	200	40	1.36	0.61
9. I play games of chance.	71	45	675	2.76	0.62	121	193	464	2.44	0.82
10. In general, I am content with my life	548	152	90	1.42	0.69	392	234	151	1.69	0.80
Innovativeness Related Attitudes				2.07					1.92	
1. I always take cognizance of my friends/surrounding	467	254	67	1.49	0.66	488	250	40	1.42	0.62
2. I can easily change my routines	141	195	448	2.39	0.79	151	203	418	2.35	0.82
3. I follow innovations and try to be among the first users.	285	253	249	1.95	0.84	410	266	98	1.60	0.74
4. I do not live conventionally.	41	154	595	2.70	0.57	25	172	580	2.71	0.55
5. I am always open to innovations.	347	246	195	1.81	0.82	485	197	95	1.50	0.73

1: Agree, 2: Partially Agree, 3: Disagree.

It is seen that some information about general nutrition and the food storage is not well known either by women or men. In the agricultural production the least exercised activities by women are drug and fertilizer usage. The annual average time spent by women for fertilization activities is 17 hours/year and 23.6 hours/year for disinfection; both of these time intervals are spent for preparation and ex-disinfection related activities. Therefore, women lack information on these subjects. Women mostly work for animal care (770.65 hours/year) and marketing activities (210.8 hours/year). Under the life style related attitude differences, the differences between women and men in terms of healthy nutrition, working in a non-agricultural sector and being up-to-date are remarkable. The belief of women that they eat healthily is more powerful than the men's and is consistent with the food safety related attitudes. Still the studies exercised reveal that consumers need professional help for food safety (Wilcock et. al., 2004) since the terms of food safety and quality are not well known by consumers, food hygiene and safety are ignored (Bonroy and Laclau, 2001). Men are more eager than women to non-agricultural working. Women's commitment to traditions, low level of education and sole knowledge of agricultural life-style are stated as the reasons why women are timid on the subject. In the study it is found that women follow the agenda far less than men. This is caused by the facts that women are responsible for non-agricultural works, have not enough time, and their fields of interest are distinct. Hence, in the study it is found that only 20.5% of women prefer the news as the first choice when watching TV. The rate is 84% for men. When the life-style and innovativeness related attitudes are assessed it is seen that women have more conservative manner. The desire to be one of the first attendees in any course in the region is determined to be 31.2% and in the case of agriculture-related course attendance the permission of the husband appears to be one the most important conditions (39.1%).

The Factors Affecting Food Security Perception

The results of the factor analysis initial solution that is exercised in order food safety related attitudes and socio-demographic characteristics to be interpreted under a certain number of factors are given in Table 4. Accordingly, the number of factors is determined according to the criterions of Eigen value, variance and cumulative variance. Those factors having an Eigen value of 1+ are selected and while 8 factors explain 59.3% of the change in the variance for women, 9 factors are found to be adequate for men. The Kaiser-Meyer-Olkin measure of sampling adequacy for testing whether the variables are relevant is found to be 0.713 and 0.753 for women and men, respectively. These values indicate that for both groups the sample is convenient for factor analysis.

Table 4. *Factor analysis initial solution statistical inferences*

Factors	Women			Men		
	Eigen value	Variance (%)	Cumulative variance	Eigen value	Variance (%)	Cumulative variance
1	4.1	15.3	15.3	4.0	13.9	13.9
2	2.6	9.6	24.9	2.3	7.8	21.7
3	2.5	9.2	34.1	1.9	6.6	28.3
4	1.9	7.2	41.3	1.7	5.7	34.0
5	1.4	5.1	46.4	1.5	5.1	39.1
6	1.3	4.8	51.2	1.4	4.8	43.9
7	1.1	4.2	55.4	1.4	4.7	48.6
8	1.1	3.9	59.3	1.2	4.1	52.7
9	-	-	-	1.1	3.7	56.4

The factors are entitled according to the varimax rotation. For the entitlement those variables having factor loads of 0.45 or more are taken into consideration. In Tables 5 and 6 the results of rotation solutions are given for women and men, respectively. In the rotation solution there are factor loads and dependency rates. The dependency rate is calculated through the summation of the squares of (horizontal) factor coefficients of each variable. High aggregate dependency rate that is inferred from the obtained results are statistically meaningful and also the common characteristics of it with the other variables analysed are proportionately high (Çabuk and Şengül, 2000).

The Factors Effective on the Perception of Food Safety among Women

For women the most explanatory factor of food safety perception is the first factor and it explains 15.3% of the variance. This factor is termed as “*innovativeness*” and encompasses the variables related to the participation, willingness of rural women to innovations and also the follow-up of innovations by them.

The second factor explains 9.6% of the variance and entitled as “*flight from agriculture and trust*”. In this factor an inverse relationship between the desire of women to live in cities and to work at non-agricultural sector, and the confidence for public institutions is determined. The confidence of women, who feel the propelling effects of agriculture and rural environment and feel attractive effects of the cities and therefore leave rural areas, is quite low for public institutions. If the low quality of the services of public institutions in rural areas and the problems of accession to these services are taken into account the above statement is comprehensible. Additionally this factor includes the assessment variables related to general economic developments and the confidence variables for the products of large retailers.

Table 5. *Factor analysis rotation solution for females (a)*

No	Factor variables	Factor no	Values	Dependence
1	Following innovations and being among the first users	Innovativeness	0.763	0.682
2	Desire for attending agricultural courses		0.731	0.671
3	Openness to innovation		0.709	0.635
4	Always being up to date		0.551	0.459
5	Desire for more education		0.809	0.695
6	Confidence for public institutions	Flight from agriculture and trust	-0.721	0.624
7	Desire for urban life		0.626	0.531
8	Desire for a non-agricultural job		0.492	0.522
9	Economic recovery in Turkey		0.654	0.610
10	Reliance of the products sold in supermarkets.		0.637	0.543
11	To buy and use broken, cracked eggs	Consciousness and routine	0.756	0.628
12	Harmlessness of malted potato		0.746	0.636
13	Changing routines hardly		0.487	0.571
14	Enhancing productivity through fertilizer utilization		0.462	0.562
15	Harmlessness of sewage to plant and human being.		0.457	0.541
16	Healthily diet	Life attitude	0.790	0.657
17	Overall life satisfaction		0.740	0.618
18	Taking cognizance of friends/surrounding		0.492	0.541
19	Playing games of chance.	Future anxiety and risk taking	0.672	0.547
20	Desire for the children to engage in agriculture		0.619	0.561
21	Knowledge of genetically modified product	Agenda	0.689	0.577
22	Knowledge of EUROGAP Protocol		0.677	0.497
23	Knowledge of the EU		0.504	0.515
24	Consumption of self- production with inner peace	Product quality	0.790	0.712
25	Belief of healthiness of the products they produce.		0.678	0.585
26	The age of mother	Demography	0.788	0.705
27	The education of mother		-0.632	0.579

(a) *Rotation converged in 10 iterations.*

The third factor explains 9.2% of the variance and entitled as “*consciousness and routine*”. In the factor there are variables indicating the level of awareness of and the attitudes to food safety in consumption and production. The commitment to routines is also included in this factor. The misinformation about the commitment to routines and food safety are included in this factor in the same way.

The fourth factor entitled as “*life attitude*” can explain 7.2% of the variance. In this factor there are some general life attitude variables. The factor constructs a positive relationship among general attitudes for life such as life satisfaction among women living in rural areas, the belief of a healthy diet and positive view of social environments.

The fifth factor is entitled as “*future anxiety and risk taking*”. In this factor, explaining 5.1% of the variance, there are the variable of non-agricultural em-

ployment expectations of women for their children and the variable of game of chance that represents risk taking. As can be seen in Table 3, women do not think agriculture sector as a field of warranted employment and expect them to work in non-agricultural sectors. Women perceive that the employment of children in agricultural sector is risky.

The sixth factor contributes 4.8% to the change in the variance and is entitled as “*agenda*”. It encompasses the variables of connection with the agricultural sector related dynamic subjects and possession of knowledge.

The seventh factor is entitled as “*product quality*” and explains 4.2% of the change in the variance. In this factor there are variables measuring the confidence of women to the quality of their own products.

Eighth factor is the “*demography*” factor and its variance is 3.9%. In the demography factor there is an adverse relationship between the age and education of women, and this is an expected situation. In recent years efforts are made by many initiatives and society to increase the enrolment rates of girls to schools and to enhance their education. The low literacy rate among women living in rural areas is caused by the traditional considerations in the past. Inherently, the schooling rate among young women is found to be higher.

The Factors Effective on Male Food Security Perception

Among men the first factor that mostly explains the change (13.9%) is entitled as “*openness to innovation and control*” (Table 6). Here being controlled is caused by the 5th and 6th variables that explain controlled and conscious behaviours against known misapplications. Accordingly how much men are innovative, they are that much controlled or they have that much proper attitudes related to food safety. In the factor there are some variables that coincide with and differ from women. It is remarkable that the most descriptive factor that explains the variability for women is “*innovativeness*” that contains openness to innovations and following the agenda. However for men the factor is also determined to be in relation with some extra variables such as attitudes to food safety and individual attitude characteristics.

The second factor is the “*product quality and safety*” factor and explains 7.8% of the variance. This factor is calculated under the analysis made for women but the factor is determined to contribute less to the change. Besides, unlike women the view among men that there are not adequate information on media about food health and safety is also calculated as a meaningful variable in this factor.

Table 6. Factor analysis rotation component matrix for males (a)

No	Factor variables	Factor no	Values	Dependence
1	Openness to innovation	Openness to innovation and control	0.770	0.621
2	Fascination of freedom		0.726	0.580
3	Following innovations and being among the first users		0.683	0.551
4	Taking cognizance of friends/surrounding		0.634	0.515
5	To buy and use broken, cracked eggs		-0.620	0.566
6	Harmlessness of malted potato		-0.540	0.598
7	Being lively and quick		0.517	0.443
8	Always being up to date		0.482	0.389
9	Belief for the healthiness of self-production	Product quality and safety	0.798	0.675
10	Consumption of self-product with inner peace.		0.769	0.634
11	Belief that food health and safety is not adequately promoted on media.		0.500	0.440
12	Confidence for public institutions	Economic confidence	0.752	0.655
13	Overall life satisfaction		0.751	0.619
14	Economic recovery in Turkey		0.626	0.629
15	Belief that boiled milk do not spoil	Consciousness and routine	0.704	0.557
16	Enhancing productivity through fertilizer utilization		0.652	0.548
17	Changing routines hardly		0.491	0.543
18	Knowledge of genetically modified product	Agenda	0.687	0.557
19	Knowledge of EUROGAP Protocol		0.653	0.525
20	Knowledge of the EU		0.558	0.505
21	Desire for urban life	Rural area leaving	0.765	0.637
22	Desire for a non-agricultural job		0.764	0.632
23	Necessity of record keeping at every stage in the farm	Development	0.566	0.632
24	Desire for more education		0.562	0.552
25	I play games of chance	Future anxiety and risk taking	0.711	0.553
26	Desire for the children to engage in agriculture		-0.594	0.490
27	Education of the head of household	Demography	-0.735	0.664
28	Age of the head of household		0.701	0.623

(a) Rotation converged in 8 iterations

The third factor is the “*economic confidence*” factor and it indicates that unlike women, men assess general economic developments and public sector with a different dimension besides agriculture and rural life. The third factor explains 6.6% of the variance.

The contribution of fourth factor to the change is 5.7% and it is entitled as “*consciousness and routine*”. Just like the case for women, it is remarkable for men that there is a positive relationship between having misinformation in terms of food safety and having difficulties in changing routines.

The fifth factor, as the sixth factor for women, is entitled as the “*agenda*” factor. The contribution of the agenda factor to change is found to be higher (5.1%). In this factor, just like the case for women, there are some variables related to agriculture and general agenda.

The sixth factor is the “*leaving rural area*” factor that explains 4.8% of the variance. The factor contains variables related to non-agricultural employment of individuals and desire of living in cities. Rural migration started in the second half of twentieth century has accelerated due to both social and economic reasons. The inherent risk and obscurity in the agricultural sector, the low income compared to the work and other social reasons (utilisation of education and health institutions, desire of social status alteration, customs and pressure of terror etc.) are also the fundamental reasons of rural migration. In the study it is determined that parents’ desire for leaving the rural is not for themselves but mostly for their children. Particularly this factor is quite different from women in terms of level and content.

The seventh factor has a variance of 4.7% and entitled as the “*development*” factor. This factor indicates that those household heads are eager to develop themselves tend to the farm management related developments. This factor should be focused on in terms of the business development and the enhancement of quality standards.

The contribution of the eighth factor to the explanation of the change is 4.1% and encompasses the same variables with the “*future anxiety and risk taking*” factor of women; the same title is valid for men. However, there is an adverse relationship between the variables. Contrary to women, this factor reveals that although men find agricultural sector inappropriate for their children, they – who beware of playing games of chance, that is to say risk adverse men – find staying at agricultural sector rather than leaving it more confident.

The ninth factor is entitled as the “*demography*” factor and its contribution to the variance is 3.7%. In the demography factor, like the case for women, there is an adverse relationship between age and education and it is an expected situation.

Conclusions

In recent years, food safety and quality has been one of the prior issues of all societies. Thus, it has been aimed to present the awareness and interest level of individuals who has been doing agricultural activity, about food safety and quality. The demographic differences in the study which applied in 9 different regions and 18 cities have reflected Turkey in general. While family size has been bigger, the education level is lower in South-Eastern Anatolia Region than the other regions

in Turkey. Due to the early marriage age, maternal age mean (35.5) is lower than the other regions.

Although, women's attendance to the agricultural activities differs among regions, they participate in every phase. However generally women's responsibilities are much more effective in animal production activities than vegetative production in Turkey but in some special products women are curial labour force. Women work mostly in agricultural activities, animal care (770.65 hour/year) and marketing (210.8 hour/year). Besides, having role in many activities even not very actively makes women important in all production chain. For instance, while men apply disinfectant generally, women take place in works such as the preparation step of the disinfection substance. Women's importance and role in marketing activities and food preparation should be taken into the consideration. In the activities which women take place actively in, informing women about factors threatening food safety and thus decreasing the risks is probable. Additionally, the techniques which enable them to be active participants in accordance with their skills should be applied during the educational process through investigating women's need, information requirements and agricultural activities in which they are active. Women's being more innovative than men may contribute to these studies' results in a positive way.

The extensiveness of getting professional services is notably low among the participants. Mostly, agricultural pesticide sellers and government officers are perceived as an important source. When the high level of thrust in the government is taken into consideration, transmission of the suggestions related to the food safety through government can increase the acceptance.

Although findings have revealed that women are more innovative, it has been designated that making benefit of these innovations is dependent to the husband's permission. Conservative view has been common in rural areas but regional differences are remarkable. In west regions women's being more innovative and interiorizing this of their own free will than the women in the east and north regions becomes prominent. Conventionality affects the will to work in the non-agricultural works. Men are more willing to the non-agricultural works. Women's low educational level and their perception of agricultural activities as a part of rural life are the factors affecting to work in agricultural sector.

Preparation of programmes and projects through the improvement of the economical tools in businesses and participatory approach, improvement in many fields of agriculture can be provided. There has been also a need for the activities which take the women's and men's responsibilities, roles and from which communication tools they benefit into account. Producers' concerns related to the risks arising from food are ambiguous so it necessitates creating awareness about this issue. It is essential to reveal this need of producers and make them accept the need. To realize this via the institutions which they are mostly in contact with may present positive results.

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