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Food Quality Assurance Schemes in Turkey

Ahmet Ali Koç, Serhat Asci, Hami Alpas, Fatma Handan Giray and Stephan Hubertus Gay

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TURKISH FOOD QUALITY ASSURANCE SCHEME

The mission of the JRC-IPTS is to provide customer-driven support to the EU policy-making process by developing science-based responses to policy challenges that have both a socio-economic as well as a scientific/technological dimension.

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Executive Summary

The Institute for Prospective Technological Studies (IPTS), one of the seven research institutes of the Joint Research Centre (JRC) of the European Commission (EC), has conducted research on food quality assurance with the idea of enhancing value added to farm products. From 2005 to 2007 the JRC-IPTS carried out two projects on food quality assurance schemes in the EU-25[1]. In 2008 and 2009, the JRC-IPTS cooperated with Akdeniz University (UNIAKD) to analyse food quality assurance schemes in Turkey.

In the study the governance structure of food quality assurance in Turkey is explained, which includes public, semi-public and private institutes, laws and legislations, policies and research. There are five public and one semi-public institution with relevance to food quality and safety in Turkey (the Ministry of Agriculture and Rural Affairs (TKB), the Turkish Standards Institution (TSE), the Turkish Patent Institute (TPE), the Under-Secretary for Foreign Trade (DTM), the Under-Secretary of the State Planning Organisation (DPT), and the Turkish Accreditation Agency (TÜRKAK)).

A workshop with the participation of key stakeholders was organised in order to carry out a SWOT analysis of the food quality assurance in Turkey. The Logical Framework Matrix (LFM) incorporated the opinions, ideas and contributions of stakeholders. Producer organisations, food processing industry associations and cooperatives in the food sector were invited to the workshop in Ankara for a broad contribution. The project team moderated the LFM discussion based on the preliminary LFM derived from the SWOT analysis conducted in previous workshops. Afterwards, a Rapid Rural Appraisal (RRA) study was conducted by interviewing local stakeholders and farmers from 12 villages who produce major commodities in terms of the production volume, export value or special characteristics.

A lack of quality awareness of consumers and producers is determined as the main problem from the SWOT and LFM studies. Producers' knowledge is limited and their quality perception focuses mainly on food safety. Furthermore disorganised small scale producers are unable to solve quality issues by themselves. Coordination and collaboration among actors in the food chain are weak in terms of developing and ensuring food quality. Incentives for food quality through complementary procedures or financial support are limited. Therefore it is difficult for small producers and enterprises to improve product quality, which might result in exclusion from dynamic food markets. Through the RRA studies on the participation of small-scale producers in organic farming it was also observed that they voiced limited interest in the subject. Key stakeholders are not sufficiently organised to obtain Geographical Identification (GI) certification for the important food products in their region.

There are barriers in exports due to insufficient quality, reducing the Turkish share in world food markets. However, the infrastructure regarding food safety issues, such as minimum legal requirements, requested by importing country authorities and/or multinational food retail chains, has generally been improved in Turkey. For example, observations show that there are great quality improvements in milk production; milk quality now exceeds the minimum Food Codex requirements. The main driver for this improvement is the existence of large scale national and international dairy companies pushing forward quality standards in the market.

[1] Visit http://foodqualityschemes.jrc.ec.europa.eu/en/index.html for more information.

The conclusions of the project lead, among others, to the following recommendations. Consumer and producer quality awareness must be improved to effectively overcome food quality assurance scheme problems in Turkey. Therefore, cooperation between different government institutions, and also media, is required to inform the wider public about food quality. Investment in infrastructure is required of public institutions to further develop the necessary conditions for the production of safe and quality foods. Marketing campaigns abroad could promote GIs and organic agriculture in Turkey. The EU accession process is supportive of the development of food quality in Turkey and its continuation will be an important driver in the coming years, as will be support from the EU and other international organisations, e.g. the World Bank. Future research may focus on supply chain analysis and obstacles to collaboration between key actors, consumer response to quality in domestic markets, and on a model to prevent small scale producers being excluded from dynamic markets.

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1. Introduction

The Institute for Prospective Technological Studies (IPTS), one of the seven research institutes of the Joint Research Centre (JRC) of the European Commission (EC), has conducted research on food quality assurance under the idea of enhancing value added to farm products. The research was initiated in 2005 by the European Parliament and DG Agriculture and Rural Development asked the JRC-IPTS to carry out a project on 'food quality assurance and certification schemes managed within an integrated supply-chain in the EU-25'. The research aimed to (i) identify the driving factors of the EU food industry development and their impact on production and trade, and (ii) analyse the advisability of a community legal framework for protection of food quality and certification schemes. The work was structured into two major steps: (a) stakeholders consultation process, which included a series of workshops in selected MS, stakeholders' hearing in May 2006 and the final stakeholders' conference in February 2007 to ensure that the analysis was based not only on the best existing knowledge in the field, but also on the experience and knowledge of the different stakeholders; (b) research studies on food supply chains (dynamics, quality certification, review of existing studies and methodologies, food quality assurance scheme inventory and the economic analysis of nine case studies included)[2].

Following the above studies, the JRC-IPTS decided to expand this research on food quality issues to Candidate Countries. The JRC-IPTS has cooperated with Akdeniz University (UNIAKD) to expand the project. The food quality assurance schemes project in Turkey started in July 2008 and lasted for a period of seven months.

This study initially elaborates the governance structure of food quality assurance in Turkey which includes public, semi-public and private institutes, laws and legislations in a broad based perspective, and policies and research on food quality issues. Thereafter, a workshop was organised with the participation of key stakeholders in order to carry out a SWOT analysis of the food quality assurance in Turkey. The third activity was focused on building a Logical Framework Matrix (LFM), with stakeholders from the food and feed industry and public institutions, based on information gathered from the previous three activities and contributions made by stakeholders. Following these activities, a Rapid Rural Appraisal (RRA) study was conducted by interviewing local stakeholders and farmers in villages located at 12 different locations and on nine major commodities in terms of the production volume, export value or special characteristics. This report provides final conclusions and specific recommendations.

[2] Visit http://foodqualityschemes.jrc.ec.europa.eu/en/index.html for more information.

2. Review of the current setting regarding food quality in Turkey

Food quality corresponds to food characteristics including external factors (texture, flavour, origin and appearance; size, shape, colour) and internal factors (chemical, physical, microbial) (Grunert, 2002). Food quality also deals with the traceability of raw materials, ingredients and packaging as suppliers and consumers may be susceptible to any form of contamination, and consumers and retailers also need to trust manufacturing and processing standards. In addition, food quality also deals with labelling issues to ensure the correct use of products, ingredients and provide the correct nutritional information.

Agriculture still plays an important role in Turkey's economy, even though its share in the economy has decreased significantly during the last few decades. The agricultural sector made up about 22 % of GDP (Gross Domestic Product) at the beginning of the 1980s, but that has declined to around 10 % in recent years. The annual growth rate of the Turkish agricultural sector was 3.4 % in 2009 and 0.08 % in the first half of 2010 (DPT, 2010). Agriculture is still an important buffer against urban unemployment. Total unemployment account for 14 % in 2009 and 10.4 % in July 2010, for non-agricultural activities these figures are 17.4 % and 13.6 %, respectively. However, nearly 30 % of the economically active population lives in rural areas (DPT, 2009), while agricultural employment accounted for 24.6 % of employment in 2009 and 26.8 % in August 2010, according to the participation in the workforce (DPT, 2010). Agriculture, fishery and food products-beverages made up around 8.4 % of the total export value of 107.2 billion US$ in 2007 (DPT, 2008).

The size of the Turkish food sector is estimated to be 45 billion Euros globally. The food processing sector represents a 20 % share in total production of the manufacturing sector and contributes approximately 5 % to the Gross National Product (Guittard, 2006). According to the Industry Census of TUİK in 2002, there are 30 649 enterprises and 247 769 employees in the food processing sector (DPT, 2007). Most of them are small to medium-size enterprises. It was also mentioned in the food industry expert committee report that around 10-12 % of the food processing enterprises are relatively modern and of a large size. Only a small proportion of food processing enterprises firms meet the EU quality norms-standards (Oskam *et al*, 2004). These figures have been improved rapidly during the last few years at the request of multinational food retail chains and export markets.

Turkey has also been a contractor in a series of international agreements related to fair trade rules since 1994. Therefore, some commitments have to be undertaken such as establishing special courts to create powerful industrial property rights throughout the country, and training and presentation functions must be performed to raise public awareness. For instance, the 'WTO agreement' and its annex IC 'Agreement on Trade-Related Aspects of Intellectual Property Rights' and the customs union with the EU were constrained by liability regarding patents, trademarks, industrial design and geographical indications[3] (GIs).

Policies dealing with food safety and quality started to develop in the mid-1990s, due to the customs union agreement with the EU in 1995, and strengthened during the 2000s because of exports to developed market economies and greater concern over food safety and quality. The penetration of supermarkets into domestic retail markets is another driving force behind food quality and safety (Oskam *et al*, 2004): simulations of the long-term impact of EU accession

[3] GIs cover both PDO and PGI according to the Turkish legislation, similar to the EU quality system.

suggest that the increased market access to the EU could generate a significant increase in demand, in both quantity and quality, that would support significant growth of the agricultural and food sectors in Turkey (World Bank, 2006). Turkey has formally adopted a number of typical elements of food safety regulations and control systems in the accession period to the EU. There are developments which signal some of the more formal approaches to deal with food safety and a few available empirical analyses of food safety applications in Turkey, but it is difficult to discuss food quality issues as there is no accessible comprehensive study and the definition of quality is even more difficult.

This chapter provides information and describes the current situation of food quality assurance schemes in Turkey. It contains a literature review, projects implemented to improve infrastructure of food quality assurance schemes, information about main public, semi-public and private organisations, legislations related to food safety and quality, policies supporting food safety and quality, and information about the current situation of food quality assurance indicators.

2.1. Organisations responsible for the food quality infrastructure

There are five public institutions and one semi-public one with relevance on food quality and safety in Turkey. Enforcement of the responsibility of food safety was divided between the Ministry of Health and the Ministry of Agriculture and Rural Affairs (TKB) with Decree-Law 560 in 1995 and, later, unified at the TKB in 2004 with Food Law No. 5179. Both ministries prepared the framework 'Decree-Law 560' and the Turkish Food Codex together. Until Food Law 5179/2004, the Ministry of Health and TKB were the two major government departments responsible for food safety controls at selling and serving points (the Ministry of Health) and for the production units (TKB). Both were also responsible for registering and giving permission to food producing firms, as well as for onsite inspections of food producing plants and food selling points before the 'Food Law No. 5179'. With this new food law, TKB became the competent authority for inspecting all food stages from production to consumption and took over all responsibility for food safety inspections. Inspection and analysis of drinking water quality and safety remains the responsibility of the Ministry of Health. However, considering that the EU accession period is one of the most important drivers of food safety and quality issues, after EU criticism of 'Food Law No. 5179' regarding the national food codex commission, risk analysis, scientific committees, national food assembly, feedback system, temporally injunction, emergency cases, crises management, traceability and market monitoring (Giray *et al.*), a new draft was prepared and submitted to the parliament in 2009. The 'Veterinarian Services, Crop Health, Food and Feed Law No. 5996' (Official Gazette, 13.06.2010; No. 27610) has been approved and enforced since June 2010.

The Under-Secretary for Foreign Trade (DTM) and General Directorate for Standardisation for Foreign Trade has inspection units at selected points for the issuance of the 'Inspection Certificate(s)' for agricultural products to be exported/imported within the scope of the standards mandated in exports/imports.

The Under-Secretary of State Planning Organisation (DPT) is the main decision-making body and is responsible for preparing the Development Plans and Annual Programmes of the Government including food safety and quality policies and investment decisions for improving the quality assurance infrastructure of TKB.

The TSE (Turkish Standards Institution) previously had a very important role in food quality, since they prepared the respective mandated Turkish standards, conducted conformity assessment tests and issued certificates for the respective food products. But with the new legislation, their official role is reduced to issuing only Conformity Certificates to food importers and to conducting auditing activities for the quality assurance systems (ISO 9000s, 22000 and so on) established by food producing plants. This latter function is also being practiced by private European firms with regional offices in Turkey (i.e. Bureau Veritas, TÜV).

Moreover, the Turkish Patent Institute (TPE) acts as a certification and auditing body for trademarks and GIs. TPE has been established, as an independent legal entity with a special budget being attached to the Ministry of Industry and Trade with the objective to support technological development in Turkey and to protect industrial property rights, as well as to provide the public with information on industrial property rights, thereby supporting the cultivation of a competitive environment and the development of research and development activities (www.tpe.gov.tr).

In addition, the Turkish Accreditation Agency (TÜRKAK) is a semi-public accreditation body supplying accessibility of standards and quality audits worldwide. TÜRKAK has been established subject to private law provisions, but is linked to the Prime Ministry. TÜRKAK accredits local and international bodies rendering laboratory, certification and inspection services, ensures the operation in accordance with established national and international standards, and thereby facilitates international recognition of product/service, system, personnel and laboratory certificates (www.turkak.org.tr).

Table 1: Role of the main institutions in Turkish food quality assurance

Institution	Main related laws	Issue date and number	Role in food quality	Harmonisation status with EU legislation	Status
Ministry of Agriculture and Rural Affairs (TKB)	Veterinarian Services, Crop Health, Food and Feed Law N. 5996 Food Law No.5179 Organic Farm Law No. 5256 ITU (GAP) Regulation	13.06.2010 No. 27610 05.06.2004, No. 25483 01.12.2004 08.09.2004 No. 25577	Mainly responsible for food safety, animal welfare and agricultural production.	- Food Law does not include feed and veterinary concepts. - Not harmonised with the latest law released in the EU. - idem for requirements of GlobalGAP.	Public
Turkish Standards Institution (TSE)	Law No.132 (establishment)	18.11.1960	Responsible for the preparation of Turkish food standards.	- Harmonise some food product standards with Codex.	Public
Turkish Patent Institute (TPE)	GIs Law No.555	27.06.1995 No.22326	Trademarks and GIs Certification institute.	- There is yet no TSG concept.	Public
Under-Secretary for Foreign Trade (DTM)	Foreign Trade Technical Inspection Law No.4703 Communiqué about Turquality support	11.07.2001 No. 24459 24.05.2006 No. 26177	Responsible for the inspection of product standards in foreign trade. Regulating incentives for the quality of exported products.		Public
Under-Secretary of State Planning Organisation (DPT)	Law No.4004 (reorganisation)	16.06.1994	Responsible for the preparation of Development Plans and Annual Programmes of the Government, including investment for improving food safety and quality infrastructure.		Public
Turkish Accreditation Agency (TÜRKAK)	Law No.4457 (establishment)	27.10.1999	Responsible for accessibility of standards and quality audits worldwide.		Auto-nomous
Ministry of Health*	Law No.1593	24.04.1930	Responsible for inspection, safety and quality of drinking and usage water.		Public
Municipalities*	Law No. 5216 Law No. 5393 Law No. 5302	10.07.2004 03.07.2005 22.02.2005	Responsible for food safety inspections at food selling points and the food service sector.		Public
Ministry of Industry and Commerce*	Law on SMEs Development and Support	12.04.1990 No. 3624	Responsible for SMEs organisation and supporting their requirements.		Public

* No direct responsibility to ensure food quality.

2.1.1. Public institutions

Ministry of Agriculture and Rural Affairs (TKB)

The Ministry of Agriculture and Rural Affairs (TKB) has two essential sections which are the main service units and advisory and control units. The main service units of TKB are the General Directorate of Agricultural Production and Development, the General Directorate of Plant Protection and Control, the General Directorate of Structuring and Support, and the

General Directorate for Agricultural Research and Department of Foreign Affairs and EU-Coordination. TKB conducts research, and prepares plans and programmes on the improvement of agricultural production, and conservation of natural resources such as land, water, plants and animals. In addition, support of animal breeding, control of food and feed production and usage of plant and animal drugs, supervision of services related to food and feed, control of animal diseases, provision of agricultural services and infrastructure, and rehabilitation of social services related to agriculture are also under the mandate of TKB[4].

In Turkey, TKB is the main responsible institution for food safety. According to Food Law No. 5179, TKB is mainly concerned with the technical and hygienic aspects in food production sites and focuses on the issuing of production licences for food producers and the control of selling and consumption points. TKB also issues control certificates for imports and exports of foodstuffs. In addition, TKB is the contact point of the Codex Committee in Turkey and related product communiqués.

The food inspection system of TKB is composed of 40 laboratories within 81 provincial directorates and over 5 000 food inspectors are carrying out food inspections (Koç, 2007).

TKB is also responsible for the general management of the organic fruit and vegetable cultivation system and Good Agricultural Practices (GAP) in Turkey. The Secretariat of Organic Agriculture and the Organic Agriculture Committee were established in 1993 under the Department of Research, Planning and Coordination, which is classified as one of the advisory and control units. Through the restructuring of TKB due to harmonisation of institutions for EU accession, the responsibility was taken from the Department of Research, Planning and Coordination and given to the General Directorate of Agricultural Production and Development in 2003 and a GAP[5] (ITU) section was also established in the same unit. Currently staff dealing with issues on organic agriculture and GAP is employed in the Alternative Agricultural Production Techniques Department.

[4] www.tarim.gov.tr; access date: 15.08.2008.

[5] ITU refers to Good Agricultural Practices (GAP) in Turkish and the ITU standards are regulated by Turkish legislation.

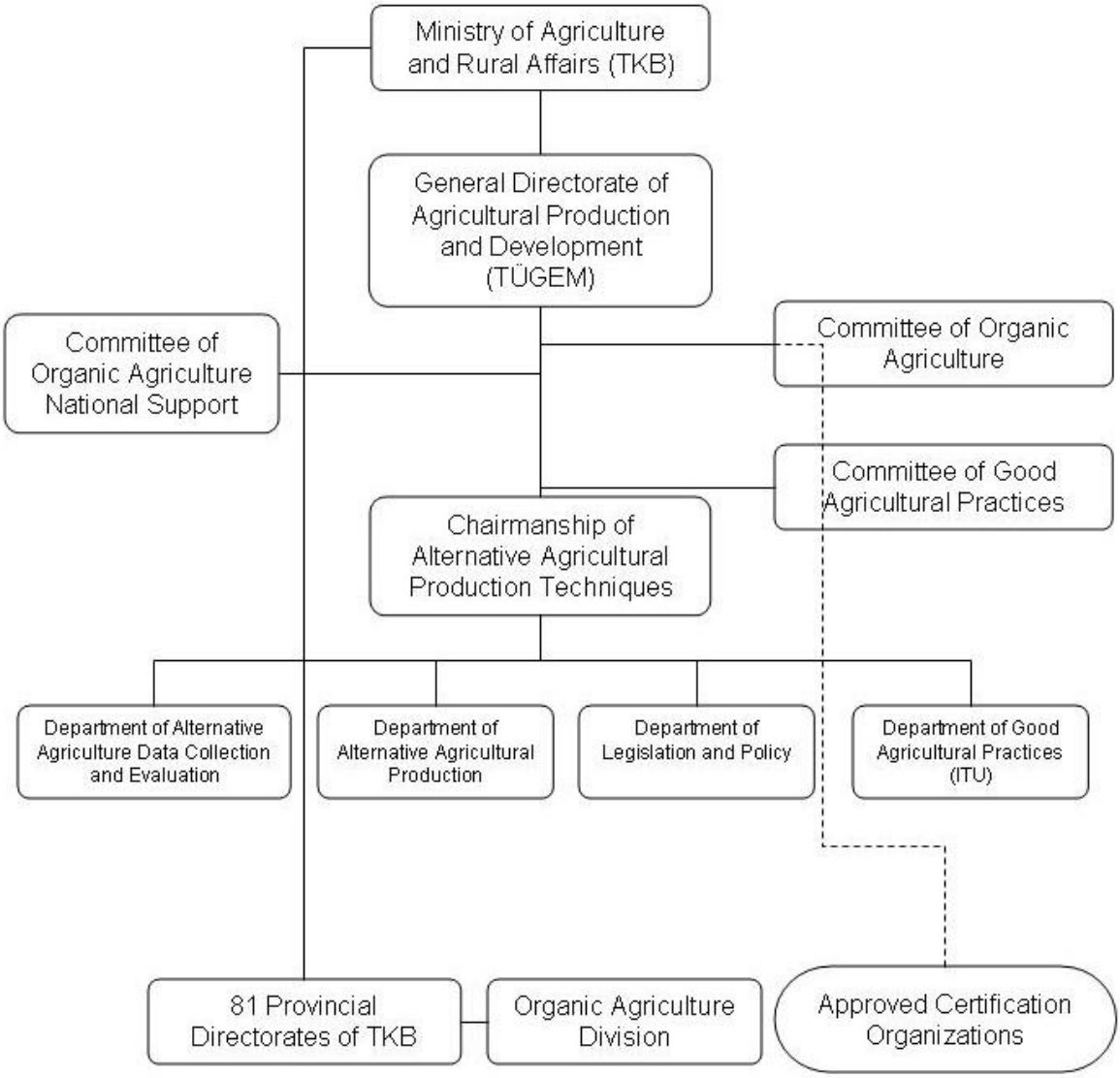

Figure 1: Organic agriculture and ITU (GAP) organisation chart in TKB

Turkish Standards Institution (TSE)

The Turkish Standards Institution (TSE) was established by Law No. 132 on 18.11.1960 for the purpose of preparing standards for every kind of item and product together with their procedure and service. Turkey has been a member of ISO (International Organisation for Standardisation) since 1955. TSE is publically funded, works according to the special rules of law and has a juristic personality. Furthermore, authorities have entrusted TSE with representing Turkey within the regional and international organisations dealing with standardisation. TSE is very active at national level but also at international level (ISO and IEC).

TSE is in charge of preparing standards for every item and product including their production procedure. The standards set by TSE are known as 'Turkish standards'. These standards are voluntary and can be made compulsory by the approval of the concerned ministry. It is essential that any standard is a Turkish standard before it can be made compulsory. The standards made compulsory are published in the Official Gazette. In 2002 there were 18 129 Turkish standards catalogued in TSE and over 20 000 in 2005.

If a firm desires to be accredited by ISO 9000 or ISO 22000, Turkish standards for products published by TSE have to be applied, and this should be audited by private auditors from certification firms. There are almost 1750 standards prepared by TSE related to food quality and sanitary aspects. All the standards will be harmonised with EU standards and almost 600 standards have been repealed by new standards since the 1990s. However, there is no mandatory domestic market inspection by TSE, although TSE contains certification auditors for products, production, services, laboratories and vehicles (www.tse.gov.tr). Furthermore, all goods imported and exported must be compatible with TSE standards and this is inspected by Under-Secretary for Foreign Trade (DTM)

Turkish Patent Institute (TPE)
The Turkish Patent Institute was established on June 19, 1994, based on the power granted by Law No. 4004 dated 16.06.1994, as an independent legal entity with a special budget acting under the authority of the Ministry of Industry and Trade.

Legislations were created as a reform feature to undertake liability on patenting, trademarks, industrial design and GIs, derived from the WTO agreement and its annex the 'Agreement on Trade-Related Aspects of Intellectual Property Rights' (TRIPS) and the customs union with the EU. Therefore, special courts were established to create powerful industrial property rights throughout the country and important achievements have been made through education and presentations to inform public-oriented users of the system.

Under-Secretary for Foreign Trade (DTM)
The Under-Secretary for Foreign Trade prepared the 'Ministerial Decree on the Regime of Technical Regulations and Standardisation in Foreign Trade' and its supplementary legislation for transparency in its implementation, gathering all regulations regarding standardisation policies in Turkey and establishing a legal base for the harmonisation of Turkish legislation with EU legislation[6] .

The 'Decree on the Regime of Technical Regulations and Standardisation in Foreign Trade' is in conformity with the requirements laid down in the World Trade Organisation's (WTO) 'Agreement on Technical Barriers to Trade'. It prohibits discrimination among trading partners and aims to ensure that imported products comply with the requirements of human health and safety, animal welfare or plant life, or the environment.

The Foreign Trade Technical Inspection Law No. 4703 is related to the controls of agricultural products to be exported within the scope of the standards mandated in exports. It also determines the framework of import controls, which are regulated by communiqués in more detail. The aim of this application, dating back to the 1930s in Turkey, is to protect the prestige of traditional Turkish agricultural products and create stable markets in foreign countries.

The standards, mandatory in exports, are TSE standards as mentioned before. These standards are parallel to the UN/ECE standards and inspections are performed according to the OECD scheme. Following the inspection carried out by the inspectors of DTM, a control certificate is given to the exporter if the product is found to be in conformity with the relevant standard. The exporter cannot export the product without a control certificate.

[6] www.dtm.gov.tr, access date: 16.08.2008

Products will be exempted from inspection if the exporter possesses the 'Certificate of Competence on Commercial Quality Inspection'. This certificate is issued by the DTM for producers who are found to be competent in carrying out inspections by themselves. These producers are subject to periodic and random controls by the inspectorates.

Under-Secretary of the State Planning Organisation (DPT)
The Under-Secretary of the State Planning Organisation (DPT) is affiliated to the Prime Minister. The main duties of DPT are listed as follows: (a) advise the government in determining economic, social and cultural policies and targets for the country by taking into account every type of natural, human and economic resources and possibilities of the country; (b) prepare long-term development plans and annual programmes in accordance with the targets determined by the government; (c) coordinate activities of the ministries and public institutions concerning economic, social and cultural policies, ensure efficient implementation and advise the government regarding policy issues; (d) develop future-oriented strategies by working closely with international institutions, help reduce uncertainties in the medium and long-term for the private sector by making policy recommendations in cooperation with the private sector.

DPT is responsible for the preparation of the annual investment programme and allocation of the national investment budget to the food control projects mentioned in the report. DPT is also responsible for the preparation of development plans and annual programmes of the government for food safety and quality policies. The last development plans on 'food industry' and 'food safety, vegetable and veterinary' were prepared in 2007 for the next five years. The reports were focused on the general situation and future expectations.

The SWOT analysis of the Turkish food industry performed by DPT highlights the importance of quality problems in the sector. According to the analysis there are two main weaknesses in the Turkish food industry regarding quality: i) there is a real problem in the supply of high quality and homogenous raw materials, and ii) applications by enterprises of food safety and quality management systems are not at a satisfactory level. The analysis defines opportunities in food quality: i) legislation is increasingly oriented towards EU standards and the preparation for EU accession may have a positive influence on the adoption of further legislation, ii) the Turkish food industry has the potential to process diversified organic and ecological products and iii) food companies are increasingly oriented towards developing quality management systems (ISO, HACCP, GAP) (DPT, 2006). Implementation of geographical indications (GIs) started in 1995 in Turkey. As of January 2009, 107 products are registered with a geographical indication certificate and 65 of them are agricultural and food products (www.tpe.gov.tr, accessed 31.01.2009). It is obvious that the application of EU food quality standards through adjustments to food safety, environmental and other standards should begin in the early stages of the accession process. This is because EU safety and quality standards will need to be implemented progressively, to allow enough time for food processors and farmers to prepare, if they have a well-defined and credible timetable, for specific adjustments.

2.1.2. Autonomous and private bodies (semi-public organisations)

Turkish Accreditation Agency (TÜRKAK)
TÜRKAK was established in 1998 with 33 employees. TÜRKAK acts as the major organisation for conformity assessment. It aims to provide information and advice to the private sector, particularly in industrial regions which are far from the central decision-

making process. At present, accreditation decisions are taken by an authorized committee composed of a general secretary and two deputies.

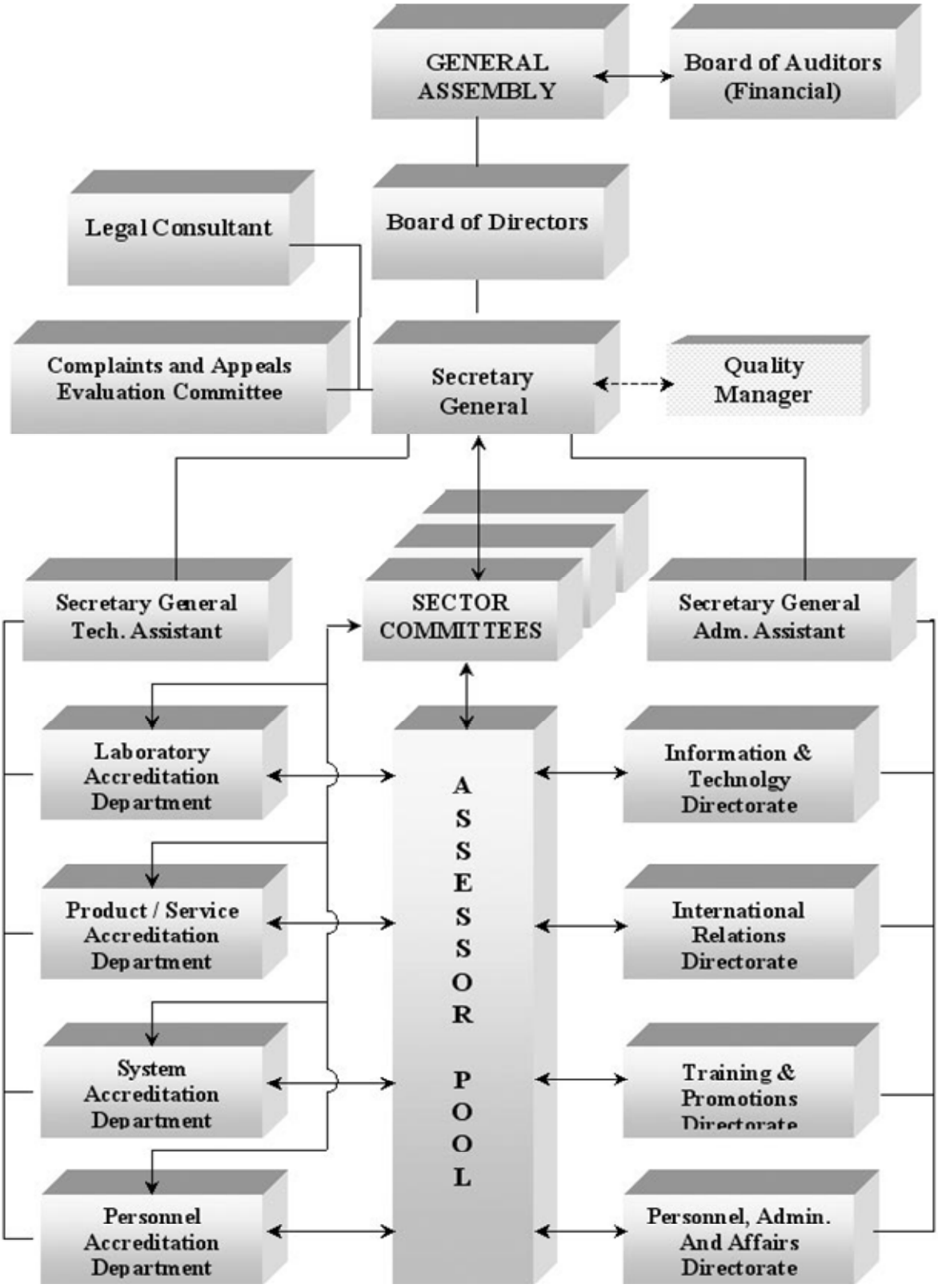

Figure 2: Accreditation mechanism of TÜRKAK in Turkey

Since April 2006 TÜRKAK has formed part of the European co-operation for Accreditation Multilateral Agreement (EA MLA) for testing, calibration, inspection and Quality Management System (QMS) certification. TÜRKAK has been evaluated for product certification, Environmental Management Systems (EMS) and certification of personnel. In May 2006, TÜRKAK signed the International Laboratory Accreditation Cooperation - Mutual Recognition Arrangement (ILAC MRA) for testing and calibration. In June 2006, TÜRKAK became a member of the International Accreditation Forum (IAF).

Table 2: List of accredited bodies by TÜRKAK (See Annex B for detailed information)

List of accredited firms and institutions	Food related accreditation	Total
Testing laboratories	27	152
Calibration laboratories	-	44
Quality Management System (QMS)	26	37
Inspection bodies	2	30
Product certification bodies	3	6
Personnel certification bodies	2	8

Source: www.turkak.org.tr (Access date, 20 August 2008).

The Hazard Analysis and Critical Control Point (HACCP) concept was introduced in Turkey with the TGKY (Turkish Food Codex Regulation) in 1997. TGKY quite clearly describes the principles and application steps of HACCP to be incorporated in food plants to achieve the hygienic conditions defined. All food sectors are foreseen to be covered, but a period of adaptation has been provided before making HACCP compulsory and subject to official inspections. Many food manufacturing and/or retailing companies in different fields of the food producing sectors started to employ the HACCP system from 1997 on, particularly food manufacturers exporting to EU countries since it is compulsory in the framework of the customs union.

The HACCP system has become compulsory both for the domestic market and all export destinations with the 'Regulation on Market Surveillance and Control of Food and Food Contact Materials and Responsibility of Food Business Operators' of 30.03.2005 and repealed by the 'Regulation on Inspection and Control of Food Safety and Quality' (9.12.2007, No. 26725). This regulation was abolished by the State Council at the end of August 2008 because of incompatibility with Municipality Laws and a new legislation, with the same content, was published on 26.09.2008. Since 31.03.2008 (Regulation on Inspection and Control of Food Safety and Quality) all food manufacturers must apply the HACCP quality assurance system.

ISO 22000, a new common standard for the supply of safe food since September 2005, should replace all HACCP standards. However, it is not expected that ISO 22000 replaces private standards like British Retail Consortium (BRC) and International Food Standards (IFS). The main differences are as follows: ISO 22000 could be intended to be used by organisations throughout the food chain and appears to be less prescriptive than private standards, in that it does not address control lists of Good Manufacturing Practices (GMPs), Good Hygiene Practices or other prerequisites in detail. ISO 22000 was published by TSE as TS EN ISO 22000 in October 2006. The certification process of TS EN ISO 22000 and other QMS is conducted by TÜRKAK accredited private certification firms. In addition, the certification process of BRC, IFS and other private standards (such as GlobalGAP and Tesco's Nature Choice (TNC)) is also carried by these certification firms; however, based on accreditation in foreign countries.

Table 3: Food manufacturing firms using quality assurance systems in Turkey

Sub-sector	Certificate types	Capacity	Firms
Meat and meat products	IFS	20 000 tons/year	Aytaç
	ISO 22000	20 000 tons/year	Aytaç, Başyazıcı.
	HACCP- TS 13001	3 000-99 500 tons/year	Altınkaya, Etsan/Apikoğlu, Şalvarlıet, Yılmazlar Et, İkbal, Sultan Et, Namet, Pınar Et, Van Et, Altın Et,Maret.
	ISO 14001	99 500 tons/year	Pınar Et
	ISO 9001:2000	3 000-99 500 tons/year	Aytaç, Pınar Et, Altınkaya, Etsan/Apikoğlu, İkbal, Sultan Et, Namet, Başyazıcı, Maret
Broiler	HACCP- TS 13001	50 000-240 000 units/day	CP Gıda A.Ş., Banvit, Beypiliç, Er Piliç, Şen Piliç, Keskinoğlu, Şeker Piliç, Köy-Tur, Emre Piliç.
	ISO 14001	240 000 units/day, 250 tons/day.	CP Gıda A.Ş., Banvit, Şeker Piliç, Emek.
	OHSAS 18001	90 000-200 000 units/day	CP Gıda A.Ş, Keskinoğlu A.Ş.
	ISO 9001:2000	50 000-240 000 units/day	CP Gıda A.Ş., Banvit, Beypiliç, Şen Piliç, Keskinoğlu, Şeker Piliç, Köy-Tur, Emre Piliç, Lezita.
Fruit juice	BRC-IFS	30 000 tons/year	Tunay A.Ş.
	ISO 22000	25 500-250 000 tons/year	Yaşar Holding (Pınar), Asya Gıda, Yörsan A.Ş., Kızıklı A.Ş.
	HACCP-ISO 13001	30 000-300 000 tons/year	Yaşar Holding, Dimes, Gülsan, Asya, Frigo-Pak, Etap, Yummy A.Ş., Yimpaş A.Ş., Tunay A.Ş., Meykon,
	ISO 14001	154 000-350 000 tons/year	Yaşar Holding, Dimes, Yörsan
	ISO 17025	350 000 tons/year	Yörsan A.Ş.
	ISO 9001:2000	200 000-350 000 tons/year	Akman A.Ş., Aroma, Göknur, Gülsan, Asya, Etap, TAT, Yörsan, Yimpaş, Yummy, Kızıklı, Tunay, Meykon
Milk and milk products	BRC-IFS	2 100 tons/day	Ak Gıda A.Ş.
	ISO 22000	250 000-450 000 tons/year	Bahçıvan A.Ş., Cebel A.Ş., Danone Tikveşli A.Ş., Eker A.Ş., Pınar A.Ş., Yörsan A.Ş.
	HACCP-ISO 13001	50-600 tons/day, 120 000-150 000 tons/year	Dimes A.Ş., Ekiciler, Enka, İtimat, Kaanlar, Kars-karper A.Ş., Sütaş, Teksüt, Yörük, Yörükoğlu
	ISO 14001	120 000-350 000 tons /year	Dimes, Pınar, Yörsan
	ISO 9001:2000	150-2 100 tons/day	Ak gıda, Aysüt, Bahçıvan, Eker, Enka, Güneysüt, İtimat, Kaanlar, Kars-Karper, Pınar, Sütaş, Yörsan, Yörük, Yörükoğlu
	ISO 17025	1 200 tons/day	Yörsan A.Ş.
	ISO 15161	1 200 tons/day	Sütaş
Olive and olive oils	USDA Organic	75 tons/day, 24 000 tons/year	EKİZ
	BRC	130.000 tons/year	Zade
	ISO 22000	130.000 tons/year	Zade
	HACCP-ISO 13001	75 tons/day, 130.000 tons/year	TARİŞ, Ekiz, Zade, Oro-Altınç, Heybe
	ISO 14001	130.000 tons/year	Zade, Komili
	ISO 17025	130.000 tons/year	Zade
	ISO 9001:2000	24 000-130 000 tons/year	Tariş, Oruçoğlu, Ekiz, Zade, Oro-Altınç A.Ş.
Biscuit, chocolate and candies	IFS	1 350 tons/day, 25 000 m^2	Ülker
	BRC	1 350 tons/day	Ülker, Halk
	HACCP-ISO 13001	100 – 1 350 tons/day	Ülker, Anı, Şimşek, Eti, Halk, Saray
	ISO 14001	600 tons/day	Halk, Saray
	ISO 18001	600 tons/day	Halk
	ISO 9001:2000	100 - 600 tons/day	Saray, Eti, Halk, Hazal, Azra, Anı
Instant soup	IFS, BRC	45 000 tons/year	Halk, Tukaş
	HACCP-ISO 13001	45 000 tons/year	Tukaş, Halk, Tamek, Aroset

Sub-sector	Certificate types	Capacity	Firms
Tomato paste	IFS	138 000-250 000 tons/year	Tukaş, Tat
	BRC	38 000-139 000 tons/year	Tukaş, Merko
	HACCP-ISO 13001	3 000-139 000 tons/year	Akfa-Akpa, Assan, Burcu, Demko, Merko, Tukaş
	ISO 17025	250 000 tons/year	Tat
	ISO 9001:2000	3 000-250 000 tons/year	Akfa-Akpa, Assan, Akson, Oraklar, Burcu, Demko, Merko, Tamek, Baktat, Tat, Tukaş
Pasta	ISO 22000	250-300 tons/day	Golda, Besler
	HACCP- ISO 13001	90-300 tons/day	Besler, Tat, Öğün, Berrak
	ISO 9001:2001	90-300 tons/day	Oba, Nuh'un Ankara, Golda, Besler, Beslen, Pastavilla, Selva, Doğa, Piyale, Tat, Türkmen, Yayla, Öğün, Berrak

Source: firms' website (note: only covers firms with information on their websites)

Producers, manufacturers, suppliers, importers and exporters of organic agricultural products have to make an agreement with certification firms authorized by TKB. They cannot maintain their activities without this agreement. This is a written agreement which states that agricultural activities should be conducted in compliance with the provision of the 'Regulation on Organic Agriculture'.

Table 4: Certification bodies for organic agriculture

Code	Company	Location
TR-OT-001	BCS ÖKO-GARANTIE	İzmir
TR-OT-002	IMO CONTROL	İzmir
TR-OT-003	ECOCERT	İzmir
TR-OT-004	ETKO	İzmir
TR-OT-005	C.U.	İzmir
TR-OT-006	EKOTAR	Ankara
TR-OT-009	ICEA ISTITULO	İzmir
TR-OT-010	CERES	İzmir
TR-OT-011	ORSER	Ankara
TR-OT-012	ANADOLU EKOLOJİK	Yalova
TR-OT-013	TURKGAP	Mersin
TR-OT-014	NİSSERT	Ankara
TR-OT-015	IMC	Ankara
TR-OT-016	ANKA GLOBAL	Ankara
TR-OT-017	KALİTEST	Istanbul
TR-OT-018	EGETAR	İzmir
TR-OT-019	BİO. İNSPECTA	İzmir

Source: http://www.tarim.gov.tr/uretim/Organik_Tarim,Organik_Tarim.html, December 2010.

The certification firms for ITU (GAP) authorized by TKB have to be accredited by TÜRKAK in relation to EN 45011 or ISO/IEC Guide 65 according to the 'Regulation on Good Agricultural Practices'.

Table 5: Certification bodies for ITU (GAP)

Code	Company
TR.İTU.1	CTR International Certification and Auditing Inc.
TR.İTU.2	MOODY International Quality Services Inc.
TR.İTU.3	ETKO Ecological Agriculture Control Org. Inc.
TR.İTU.4	ECAS Certification Auditing Inc.
TR.İTU.5	TURKGAP Agricultural Applications Control and Certification Serv. Inc.
TR.İTU.6	NISSERT International Certification and Auditing Serv. Inc.
TR.İTU.7	TRB International Certification Technical Control and Observation Serv. Inc.
TR.İTU.08	EKOTAR Control and Certification Ind. and Trade Inc.
TR.İTU.10	C.U. Certification Inc.
TR.İTU.11	ORSER Control and Certification Inc.
TR.İTU.13	KAS International Certification Observation and Technical Controlling Inc.
TR.İTU.14	ANKA GLOBAL Control and Certification Inc..
TR.İTU.15	KALİTEST Certification and Training Services Inc.
TR.İTU.16	ANADOLU Ekolojik Ürünler Kontrol ve Sertifikasyon Ltd.Şti.
TR.İTU.17	BIOAGRI International Certification , Observation, Technical Control and Training Services Inc.
TR.İTU.18	FC Certification and Training Services Inc.
TR.İTU.19	USB National Certification System Services Inc.
TR.İTU.20	AVACERT ANADOLU International Certification Services Inc.
TR.İTU.21	ALBERK QAInternational Technical Comtrol and Certification Inc.
TR.İTU.22	UKS International Quality System and Certification Inc.
TR.İTU.23	KAYOS International Certification and Control Services Inc.
TR.İTU.24	INCERT International Registration and Control Inc.

Source: http://iyi.tarim.gov.tr/anasayfam2.asp?sid=34&pid=34 , December 2010.

2.2. Legislation for food quality assurance schemes in Turkey

2.2.1. Food law

The 'Umumi Hifzisihha Kanunu', UHK, (General Code of Health Protection), adapted in 1930 from the respective Swiss law, covered regulations regarding official food controls in addition to many other aspects of public health issues. Later in 1952 a new but this time more specific regulation, 'Gida Maddeleri Nizamnamesi', (Food Commodities Regulation), was developed to further cover detailed aspects of food controls to be carried out by governmental bodies. Together with the individual food commodity standards developed by the TSE (Turkish Standards Institution), following its foundation in 1960, some of which were mandated in the local market, these three documents formed the basis of official food controls in Turkey. There were, however, numerous articles in 'Gida Maddeleri Nizamnamesi' which were contradictory to the respective mandated Turkish standards requirements, but, in 1982, a decree was issued indicating that in cases of disagreement between the two, the respective mandated Turkish standards were to be taken as the final judicial opinion, since these were prepared in conformance with the respective international standards on the subject and reflected the latest developments in modern food science and technology (F.L.I.P., 2000).

The first comprehensive food law in Turkey was Decree Law No. 560 enacted in 1995 which covers production, consumption and inspection of food, and aiming to protect public health against all possible food related risks and inspect food at all stages of the food chain (Alpay, 2001(a)). A set of regulations were prepared and published in the Official Gazette, specifically prepared for the harmonisation of the national food control system with EU food legislation. The pioneering ones were the regulations describing, in detail, the Good Manufacturing Practices (GMPs) in food producing plants in 1996 and the Turkish Food Codex (Turk Gida Kodeksi Yonetmeligi-TGKY) which contains chapters similar to the horizontal EU legislation, with corresponding specific communiqués on food additives, food contaminants, food packaging, food labelling and food hygiene. The TGKY had foreseen the

preparation of vertical codex documents covering individual commodity types, and with immediate effect many of these replaced the previously mandated Turkish standards and 'Gida Maddeleri Nizamnamesi' articles. The other important regulation regarding food safety is the 'Regulation on Production, Consumption and Inspection of Foods' published on 9.06.1998 in the Official Gazette No. 23367. This regulation was prepared in accordance with former EU regulation 93/99/EEC of 29.10.1993 on the subject of additional measures concerning the official control of foodstuffs and regulation 93/43/EEC on the hygiene of foodstuffs. The 'Regulation on Production, Consumption and Inspection of Foods' was the first regulation to include the HACCP concept in Turkish food laws. TKB and the Ministry of Health jointly took responsibility for implementing food safety legislation according to Turkish food legislation after 1995.

Following the release of EU food law Regulation (EC) 178/2002, the food decree-law No. 560 was modified and converted into 'Food Law No. 5179' on 27.05.2004 (published in the Official Gazette on 5.06.2004, No. 25483). With this new food law, TKB became the competent authority for inspecting all stages of food from production to consumption and took over full responsibility for the inspection of food safety. However, there was a great difference between EU food law and new Turkish food law. Turkish food law does not include feed and veterinary concepts, which completes food safety controls from 'farm to fork' but rather it keeps them as separate regulations. A new draft law, including feed and veterinary issues, has been prepared to harmonise Turkish food law with EU food laws (see Annex A for detailed list) and published in June 2010 as “Veterinarian Services, Crop Health, Food and Feed Law No. 5996 (Official Gazette, 13.06.2010; No. 27610).

2.2.2. Laws and regulations to improve quality of agricultural production

The value-added production in crops is related to the quality of reproduction materials with high quality and higher genetic potential in line with standards. Therefore, the new Seed Law No. 5553, which was prepared to amend the Law on Registration, Control, and Certification of Seeds (No.308 and from 1963) in line with the EU harmonisation process and by taking into account international seed systems and advanced technologies, was enacted on 31.10.2006.

With the 'Regulation for Controlled Greenhouse Production' (27.12.2003 Official Gazette No. 25329), Turkey started adapting Good Agricultural Production (GAP) standards related to important Turkish export products, such as greenhouse vegetables. Moreover, GlobalGAP (formerly used as EurepGAP) was converted into Turkish legislation and published in the Official Gazette No. 25577 as 'Regulation on Good Agricultural Practices' on 8.09.2004. Since this regulation came into effect, a total area of approximately 5 300 ha has been certified, mainly in provinces in the South such as Adana (3 000 ha), Mugla (5 000 ha.) and Mersin (4 000 ha.)[7]. The requirements of Turkish legislation and GlobalGAP are almost the same, however, Turkish certifications are not accepted worldwide. Furthermore, additional certifications are required by multinational supermarket chains such as Tesco’s Nature Choice (TNC).

Decree No. 2005/8503 of the Council of Ministers on 'Supporting Animal Husbandry', which was amended by the new Decree No. 2008/13695 on 24.05.2008, aims to increase the production of roughage, promote the breeding of studs, spread the use of artificial

[7] The information on certified areas was taken from Section of ITU (GAP), TKB in May 2008

insemination, and create regions free of animal diseases (DPT, 2006). In addition, works on the alignment of national legislation on livestock with the related EU regulations are under way. In this context, an animal identification system is almost complete including all livestock populations in the system. Since 2005, the inclusion of new born cattle into the system and the removal of slaughtered or deceased animals has been done. A similar effort has commenced to identify the sheep and goat population.

2.2.3. Organic agriculture law

The first By-Law of 'Organic Agriculture' was issued in 1994, adopting the EU definition of organic agriculture following the entry into force of Council Regulation (EEC) 2092/91 in 1991. An amendment was made to overcome some malfunctions and sanctions were added against fault and inaccuracy in organic agricultural activities with regulation No. 22328 on 29.06.1995 in the Official Gazette.

In 1999 rules on production, labelling and inspection of the most relevant animal species were introduced in the EU (Council Regulation (EC) 1804/1999 of 19.07.1999), covering issues such as feed, disease prevention and veterinary treatments, animal welfare, husbandry practices and the management of manure. In March 2000 the European Commission introduced with Commission Regulation (EC) 331/2000 of 17.12.1999 a logo bearing the words 'Organic Farming-EC Control System'. This logo can be used on a voluntary basis by producers whose systems and products have been found to satisfy Council Regulation (EEC) 2092/91. In Turkey, in 2002 the 'Regulation on Organic Agriculture Principles and Applications' (Official Gazette No. 24812 on 11.07.2002) was enacted, and a comprehensive Organic Farming Law (No. 5262) has been in force as from 1.12.2004 in line with EU Regulation (EEC) 2092/91. Moreover, a revised regulation came into force on 10.06.2005 (Official Gazette No. 25841), but the Turkish organic agriculture legislation needs further adjustments to comply with the new EU Regulation (EC) 834/2007 of 28.06.2007.

According to data published in 2007, approximately 200 000 hectares are used by 14 000 farmers for organic agriculture in Turkey. The majority of organic production is marketed abroad, primarily in the EU, and exports have been steadily growing. The domestic demand has started to increase since the late 1990s but is still relatively small to the total food demand. TKB has the legal responsibility to oversee the cultivation of organic crops.

TKB created a specific Organic Agriculture Committee (OAC), which is the main decision-making body. It prepares and implements regulations, authorises certification bodies, inspects these organisations and coordinates all other activities to improve and foster organic agriculture (Őzkan, 2002). The OAC is composed of representatives of the various directorates of TKB. In support to the work of TKB, the Turkish Association of Organic Agriculture, Wheat Association for Ecological Living and Organic Product Producers and Industrialists Association, provide policy input, contribute to technical improvements and develop the domestic market for organic products. The members of these associations include producers, exporters, academics and consumers.

Organic farming units have been established in the provincial agricultural directorates. The aim is to provide help to certification bodies with specialised staff, to collect data required by standards, and to perform inspections and certifications of companies as technical auditors. There are currently thirteen certification bodies established in Turkey.

The export of organic products to the EU requires the registration of a third country as complying with a set of rules. The Turkish Ministry of Foreign Affairs has made the application to be listed as a third country complying with these rules.

2.2.4. Decree-law for geographical indications

In 1992, the EU created systems known as PDO (Protected Designation of Origin), PGI (Protected Geographical Indication) and TSG (Traditional Speciality Guaranteed) to promote and protect valuable food names under Regulations (EEC) No. 2081/92 and (EEC) No. 2082/92.

PDO protects the name of a region, a specific place or, in exceptional cases, a country, used to describe an agricultural product or food product. The product must originate in the specific region, place or country and possess a quality or characteristics which are essentially or exclusive to a particular geographical environment, with its inherent natural and human factors. The production, processing and preparation of the product must take place in the defined geographical area.

PGI also protects the name of a region, a specific place or, in exceptional cases, a country, used to describe an agricultural or food product. The product must posses a specific quality or other characteristics attributable to the geographical origin and the production and/or processing and/or preparation take place in the defined geographical area.

TSG is used for products with distinctive features which either have traditional ingredients or are made using traditional methods (European Commission, 2007).

In March 2005, the World Trade Organisation (WTO) released a panel report regarding the European GI system (WTO, 2005). The conclusions and recommendations of the panel led the European Union to revise its rules regarding international GIs. Specifically, Regulation (EC) 2081/92 was repealed, and replaced with Regulation (EC) 510/2006. The amendment aims to comply with the agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) of the WTO. In particular, the new regulation allows the EU regulatory system to recognize and protect foreign GIs and allows foreign producers to apply directly for registration of GI products in the European Union. According to Regulation (EC) 510/2006, to obtain geographical indication certifications, the applicant must apply to its national authority. After the evaluation, applications are transmitted to the European Commission for approval. Following this procedure, Turkish products can also obtain EU certification, and 'Antep Baklavasi' (PGI in 2009) and 'Aydin Íncírí' (PDO in 2010) have submitted their applications in this way.

Regulation (EC) 510/2006 includes more detailed judgments from national legislation regarding the inspection of geographical signs than Turkish Decree-Law No. 555. These inspections have to be executed by independent and specialized control bodies accredited with the EN 45011 or ISO/IEC Guide 65 standards. This obligation must be accepted by both EU and non-EU countries before 1.05.2010. Therefore, draft legislations have been prepared in accordance with the new EU law and Regulation (EC) 1898/2006.

The protection of Geographical Indications (GIs) in Turkey is provided by Decree-Law No. 555 pertaining to the 'Protection of Geographical Indications' of 27.06.1995 covering both food and non-food materials and was revised on 7.11.1995. There is no 'Traditional Speciality

Guaranteed' concept either in this decree-law or in any other regulation compared to Regulation (EC) 509/2006. However, the last draft includes both protection of geographical signs and traditional speciality.

The authorized institute for the protection of GIs is the Turkish Patent Institute. As of August 2008, a total of 57 agricultural and food products have been approved by the Turkish Patent Institute. Thirty of the total protected products are agricultural products including grapes, raisins, apricots, nuts, tobacco, cotton, roses, olives and olive oils. Twenty seven of them are processed food and alcoholic and non-alcoholic beverages including cheese, sausages, prepared meals, candies, desserts, Turkish raki, turnip juice and honey. Moreover, 130 applications for agricultural and processed food are on the waiting list to obtain the geographical indication protection or designation of origin (www.turkpatent.org.tr, access date 2 September, 2008).

Table 6: Differences between EU and Turkish Geographical Protection Legislations

EU Regulations	Basic Rules	Turkish Laws	Basic Differences
Regulation (EEC) 2081/92 of 14.07.1992 on the Protection of Geographical Indications and Designations of Origin for Agricultural Products and Foods.	- lays down the rules on the protection of designations of origin and geographical indications for agricultural products intended for human consumption (except wine) - Only a group of natural or legal persons subject to certain conditions will be entitled to apply for registration.	Decree-Law No. 555 Pertaining to the Protection of Geographical Signs in Force from 27.06. 1995	- covers protecting the natural, agricultural, mining and industrial products and handicrafts - Groups, natural or legal persons, who are producers of the product, could apply for protection.
Regulation (EC) No 510/2006 of 20.03.2006 on the Protection of Geographical Indications and Designations of Origin for Agricultural Products and Foodstuffs.	- Registration of applications from third countries could be achieved with the proof that the name in question is protected in its country of origin. -A Member State or a third country may object to the proposed registration.	Draft Law on Pertaining Protection of Geographical Signs and Traditional Speciality Guaranteed Products	- includes both geographical signs and traditional speciality - Only groups could apply for protection. - regulates the relationship of domestic with international protection, e.g. the protection in EU

The protection of Geographical Indications (GIs) is not working properly in Turkey, as there is no specific identification (logo) for products with GIs; only five registered products use their own logo. Moreover, the consumption ratio of packaged products is low in Turkey compared to the EU; therefore the communication of GIs is more difficult in Turkey.

When the application of GIs has been made, the distinctive property or detailed identification of the products must be declared. However, some of them are not sufficiently detailed, such as Kayseri sausages and dried meat (pastrami) (no specification for the origin of the meat is given), while others are well detailed, like Erzincan Tulum cheese (e.g. milk from Karaman sheep and the altitudes of the meadows are given in detail). There are three kinds of olive oil with a PDO certificate; Edremit Korfez Region olive oil and Ayvalik olive oil have overlapping properties although they indicate different olive oil specialties. On the other hand, specific olive cultivars are indicated for Guney Ege olive oil produced in the South Aegean Region of Turkey.

Table 7: Agricultural and food products with PDO and PGI certificates in Turkey (August 2008)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	Agricultural products																													
Basic Groups	Fruits and vegetables																	Nuts						Industrial plants			Olive and olive oils			
Identity of Applicant	Erzincan Uzumlu Municipality	Izmir Mechantile Exchange	Tarsus Municipality	Denizli Isabey Municipality	Ankara Kalecik Municipality	Arapgir Municipality	Malatya Commerce and Industry Chamber	Mut Agricultural Chamber	Izmir Mechantile Exchange	Aydin Commerce Chamber	Cay Municipality	Aksehir Provincial Directorate of TKB	Salihli Commerce and Industry Chamber	Mustafa YILMAZ (Individual Person)	Sanliurfa Municipality	Kahramanmaras Commerce and Industy Chamber	Odemis Mechantile Exchange	Gaziantep Commerce Chambers	Siirt Provencial Governership	Osmaniye Mechantile Exchange	Findik Tarim Seling Cooperatives (FISKOBIRLIK)	Corum Commerce Chamber	Tavsanli Commerce and Industy Chamber	Celikhan Association of Village Servicing	Izmir Mechantile Exchange	University of Suleyman Demirel	Gemlik Mechantile Exchange	TARIS Cooperatives	TARIS Cooperatives	Ayvalik Commerce Chamber
Product Names	Cimin Uzumu (grapes)	Ege (Aegean) Sultan Uzumu (sultanas)	Tarsus Beyazi Uzumu (grapes) (Topacik)	Isabey Cekisdeksiz Uzumu (seedless grapes)	Kalecik Karasi Uzumu (grapes)	Arapgir Kohnu Uzumu (grapes)	Malatya Kayisisi (apricots)	Mut Kayisisi (apricots)	Ege Inciri (figs)	Aydin Inciri (figs)	Cay Ilcesi Visnesi (sour cherries)	Aksehir Kirazi (cherries)	Salihli Kirazi (cherries)	Anamur Muzu (banana)	Sanliurfa Biberi (peppers)	Maras Biberi (peppers)	Odemis Patatesi (potatoes)	Antep Fistigi (pistachios)	Siirt Fistigi (pistachios)	Osmaniye Kabuklu Fistigi (peanuts)	Giresun Tombul Findigi (hazelnuts)	Corum Leblebisi (roasted chickpeas)	Tavsanli Leblebisi (roasted chickpeas)	Celikhan Tutunu (tobacco)	Ege Pamugu (cottons)	Isparta Gulu (Roses)	Gemlik Zeytini (olives)	Guney Ege Zeytinyagi (oliveoils)	Edremit Korfez Bolgesi Zeytinyagi (oliveoils)	Ayvalik Zeytini (oliveoils)
Protection Types	PDO	PDO	PDO	PDO		PDO	PDO	PDO	PDO	PDO	PDO	PDO	PDO	PDO	PDO	PDO	PDO	PDO	PDO	PDO	PDO			PDO	PDO	PDO	PDO	PDO	PDO	PDO
					PGI																	PGI	PGI							

	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
	Food products																										
Basic Groups	Milk and milk products			Meat based products				Bread, pastry, cakes, confectionery, biscuits and other bakery products										Meals						Alcoholic and non-alcoholic beverages		Other animal based products	
Identity of Applicant	Erzincan Commerce and Industry Chamber	Association of Ezine Peynirini ve Man. Kor. Gel.	Edirne Commerce and Industry Chamber	Kayseri Commerce Chamber	Kayseri Commerce Chamber	Afyon Commerce Chamber	Afyon Commerce Chamber	Bozdag Itimat Sekerleme Inc. (Private Firm)	Kocaeli Tradesman and Craftsman Association	Mersin Commerce and Industry Chamber	Mustafa Kemal Paşa Municipality	Mustafa Kemal Paşa Municipality	Mustafa Kemal Paşa Municipality	Gumushane Provantial Governership	Gumushane Provantial Governership	Yasar Dondurma veGida Maddeleri A.S. (Private Firm)	Gaziantep Industry Chamber	Adana Commerce Chamber	Siirt Provencial Governership	Inegol Commerce and Industy Chamber	Salihli Commerce and Industy Chamber	Siirt Provencial Governership	Ankara Cubuk Municipality	Tekel General Directory (Public Body)	Tarsus Municipality	Siirt Provencial Governership	Zara Association of Village Servicing
Product Names	Erzincan Tulum Peyniri (cheese)	Ezine Peyniri (cheese)	Edirne Beyaz Peyniri (white cheese)	Kayseri Sucugu (sausage)	Kayseri Pastirmasi (dried meat)	Afyon Pastirmasi (dried meat)	Afyon Sucugu (sausage)	Bozdag Kestane Sekeri (chesnut candy)	Izmit Pismaniyesi (delight)	Mersin Cezeryesi (delight)	Mustafa Kemal Paşa Tatlisi (desserts)	Mustafa Kemal Paşa Peynir Tatlisi (cheese dessert)	Kemal Paşa Tatlisi (dessert)	Gumushane Komesi	Gumushane Dut Pestili (mulberry pulp)	Maras Dondurmasi (ice creams)	Antep Baklavasi (dessert)	Adana Kebabi	Siirt Buryani Kebabi	Inegol Koftesi (meatballs)	Inegol Koftesi (meatballs)	Siirt Perve Pilavi (pilaf)	Cubuk Tursusu (pickles)	Turkish Raki	Tarsus Salgami (turnip fruits)	Pervani Bali (honey)	Zara Bali (honey)
Protection Types	PDO	PDO		PDO	PDO				PDO							PDO								PDO		PDO	PDO
			PGI			PGI	PGI	PGI		PGI	PGI	PGI	PGI	PGI	PGI		PGI	PGI	PGI	PGI	PGI	PGI	PGI		PGI		

				
Zara Bali (Honey)	Edremit Korfez Region Oliveoils	Guney Ege Oliveoils	Aegean Sultanas	Aegean Cotton

Figure 3: The approved logos of the PDO certified products[8]

[8] There are only five agricultural and food products which have approved GI logos, as others did not apply for approval or did not achieve approval.

2.2.5. Law for inspection and standardisation of foreign trade

The 'Decree on the Regime of Technical Regulations and Standardisation in Foreign Trade' is in conformity with the requirements laid down in the Agreement on Technical Barriers to Trade of the WTO. It prohibits discrimination among trading partners and aims to ensure compliance with the requirements for the protection of human health and safety, animal welfare or plant health, the environment and national security. However, this was a transitional regime for harmonisation with the Community legal system. The Regime and its supplementary legislation were decided on 24.1.1995 by the Council of Ministers and published in the Official Journal on 9.3.1995. This Decree is amended by Decree No. 96/7794 on 'The Regime for Technical Regulations and Standardisation in Foreign Trade' enacted on 8.1.1996 by the Council of Ministers. This Decree and its supplementary legislation which consists of Regulations and Communiqués were promulgated in the Official Gazette on 1.2.1996 No. 22541. The Regulation and Communiqués are amended every year.

According to the Regulation of the above mentioned Regime, there exists a total of 52 inspection units called 'Inspectorates for Standardisation in Foreign Trade', within the eight Regional Directorates (Marmara, Western Anatolia, South Anatolia, Eastern Black Sea, Western Black Sea, South Eastern Anatolia, Central Anatolia and Eastern Anatolia) under the responsibility of the Under-Secretary for Foreign Trade (DTM), and the General Directorate for the Standardisation in Foreign Trade. These inspection units issue the 'Inspection Certificate(s)' for agricultural products to be exported/imported within the scope of product standards of the Turkish Standards Institution (TSE).

Agricultural products are subject to conformity inspection with regard to 70 Turkish standards. Formerly, this inspection was only carried out for exports. However the same procedure is now also applicable for imports. The inspection of agricultural products within the scope of the 70 standards prior to export and import will be performed by the Inspectors for Standardisation in Foreign Trade. These inspections are performed according to Turkish standards which are analogous to the respective OECD and EC standards. Exporters/importers should obtain an Inspection Certificate from the 'Inspectorates for Standardisation in Foreign Trade'.

Industrial products are subject to inspection by the TSE with regard to 614 standards, which are applicable on the domestic market in Turkey. Importers should obtain the conformity certificate from TSE (similar to the CE mark in EC) before importing, since all products should conform to the relevant standard or regulation or technical document in respect of the minimum requirements of human health and safety, animal welfare or plant health and protection of the environment, thus providing adequate information to the consumers at the stage of the actual import. If the importer declares that the product is in conformity with the relevant international standards (ISO, CEN, IEC, CENELEC, ETSI), the Turkish inspection may be performed upon request according to these international standards. For products already certified according to the regulations of the European Union ('CE' Mark, 'E' Mark, 'e' Mark, etc.) and freely circulating in the European Union, a conformity certificate will be issued directly in case the technical file is submitted to the Turkish Standards Institution before importing.

'The Regime for Technical Regulations and Standardisation in Foreign Trade' also regulates controls to be carried out by the Ministry of Health, the Ministry of Agriculture and Rural Affairs and the Ministry of Environment and Forestry. Pursuant to Communiqué No.2005/5

relating to human health and safety and Communiqué No.99/5 relating to human health, animal welfare and plant health, the importation of certain specific goods is subject to a control certificate by the Ministry of Health or the Ministry of Agriculture and Rural Affairs. The scope of these product groups are as follows:

- Pharmaceutical products, drugs, some consumable medical products, cosmetics and detergents (Ministry of Health);
- Food, agricultural and animal products, veterinary products and plant protection products (Ministry of Agriculture and Rural Affairs).

In order to fulfil obligations from the customs union with the European Union, for products within the scope of Communiqué No. 25373 of 14.2.2004, and amended in the Turkish Official Gazette with No. 25996 of 17.11.2005, bearing a CE mark and freely circulating in the European Union, a conformity certificate will be issued directly in case the technical file has been submitted to the Ministry of Health before the import stage.

In order to obtain a control certificate, a pro-forma invoice for the product must be presented to the corresponding Ministry. Furthermore, depending on the type of the product, the following documents will be presented to the Ministry: a Health Certificate, an analysis certificate, a formula or list of contents of the product, pedigree certificate, radiation analysis report, etc. These documents, particularly a health and/or analysis certificate should be obtained from and/or approved by the public authorities of the producer country. They should be originals and a translation is required for each, including the pro-forma invoice. A control certificate must be obtained prior to importation and presented to the Customs Administration during the actual import. The validity of the control certificate remains 6 to 12 months, depending on the product inspected.

2.3. Policies to support food quality in Turkey

According to the Organic Agriculture Law and Implementing Regulation, organic fresh vegetable and fruits are exempted from the rule that all fresh fruits and vegetables for wholesale or retail sale are obliged to pass through market halls. Thus, saving the 14.4 % deduction applied to the producer's price and the hall agent's fee of 8 % of the selling price.

In Turkey, basic Direct Income Support (DIS) is given on the basis of the land on which plant production is carried out and, since 2005, additional payments are given to the farmers who obtain soil analysis or farm organically. Subsidised credits were in 2004 to encourage farmers to produce organically, according to ITU or perform controlled greenhouse production.

Table 8: Agricultural subsidy for quality improvement[9]

Subsidy and premiums	2001 (M TL)	2002 (M TL)	2003 (M TL)	2004 (M TL)	2005 (YTL)	2006 (YTL)	2007 (YTL)	2008 (YTL)
Direct Income Support (DIS) (da)*	10.00	13.50	16.00	16.00	16.00	16.00	10.00	10.00
Soil analysis addition to DIS (da)	-	-	-	-	-	-	1.00	1.00
Organic Farming addition to DIS (da)	-	-	-	-	-	-	3.00	3.00
Bombus bees support in greenhouse production (colony)	-	-	-	-	-	-	-	50
Use of certified seeds and saplings	-	-	-	-	6 products	6 products	11 products	11 products
Additional premium for using certified seeds	Cotton and soybean	Cotton and soybean	Cotton and soybean	Cotton and soybean	Cotton and soybean	Cotton and soybean	Cotton and soybean	Cotton and soybean
Support to certified seed production for feed	-	-	-	-	-	-	3 products	3 products
Subsidised credit (deduction ratio on Agricultural Bank credit interest rate)								
Controlled greenhouse production	-	-	-	40%	40%	40%	40%	40%
ITU (GAP)	-	-	-	-	-	60%	60%	60%
Organic Farming	-	-	-	-	-	60%	60%	60%
Certified seed usage	-	-	-	-	-	60%	60%	60%
Certified fruit saplings	-	-	-	-	-	50%	50%	50%
Certified seed production	-	-	-	-	-	50%	50%	50%
Bio-safety in poultry	-	-	-	-	-	60%	60%	60%

Source: based on TKB annual support data.
* DIS does not contribute to quality production itself.

Agricultural support for controlled greenhouse production and ITU (GAP) is only subsidised through credits. In the case of controlled greenhouse production, a 40% deduction is taken from the 17.5% nominal interest rate of the Agricultural Bank. Furthermore, a 60% deduction is applicable in case of organic farming or certified ITU (GAP).

2.4. Literature review and projects implemented on food quality in Turkey

There is no comprehensive study on food quality assurance schemes in Turkey as food quality has only recently become an important issue. Food quality has become increasingly important due to standards in importing countries, including the EU and the Russian Federation food safety legislations, and standards of private global retailers' such as Kipa-Tesco, CarrefourSA and Metro Group in the domestic market. Also consumers' fears about food scares stemming from diseases such as avian influenza increased the importance of food safety and quality. Generally, quality is mainly perceived as food safety and additional attributes are less in the focus of the Turkish agricultural and food sector. Important available reports and research papers on food quality and safety issues are discussed as follows.

Previously Alpay *et al* (2001(b)) discussed the harmonisation of Turkish quality assurance procedure with EU quality standards. The competitiveness of the Turkish food industry in the EU market was analysed from a quality, food safety and environmental perspective. An impact analysis of HACCP adoption by food industry on export performance was conducted.

[9] (1) decare (da) is equal to 0.1 hectare (ha), and 1 Euro = 1.80 YTL = 1 800 000 TL, approximately.

Empirical analysis of the data from a survey of 92 food firms indicated that the main competitive factors for the Turkish food manufacturing firms in the EU market were: costs, improving product quality and adapting food safety standards.

Dolekoglu (2003) performed a survey of 302 households in Adana to clarify consumers' understanding of food quality preferences, safety requirements and basic product properties. It was found that consumers' preferences on food quality (especially for trusted trademarks) were as important as the price of the products in various markets. Moreover, economic features should be improved to supply access to more safe and nutritional food for basic requirements of people's diets. Dolekoglu also indicated that it is essential for producers, retailers and consumers to be informed and advised about quality, safety and even consumers' rights.

Oskam *et al.* (2004) carried out a study to provide a comprehensive overview of Turkey's agricultural and food sectors and the situation in its rural areas which was then used to examine potential consequences of Turkey's EU accession. It was reported that Turkey's accession to the EU offers certain opportunities to the agricultural and food sectors such as increasing security and political stability in the south eastern region of the EU in the scope of illegal movements of goods, livestock and people across these borders. In addition, there are strong opportunities for the profitable export of goods, services, know-how and capital to the Turkish market from the EU. Moreover, Turkey has a large territory rich in biodiversity, and with less environmental problems than many EU members.

Guittard (2006) prepared a report on the food safety situation in Turkey. The main results of the report are the following. Despite the significant ongoing efforts to improve the Turkish food safety situation, many gaps need to be filled. More cooperation between the agricultural sector and industry would be a key factor to improving food safety in the food chain. The goodwill demonstrated by Turkish authorities in openly cooperating with international bodies provided them with an extremely valuable learning process. With the experience gained they are now much better prepared to manage future crises and communicate risks more effectively and quickly. In order to execute the tasks required under the food safety acquis, it seems necessary to restructure and strengthen TKB. Special attention should be paid to reinforce and upgrade the control systems. Food processing operations should be improved with regard to technical and hygienic conditions.

The State Planning Organisation (DPT) of the Prime Minister published two special commission reports entitled 'Food Industry Expert Committee Report' and 'Food Safety, Phytosanitary and Veterinary Expert Committee' for the 9th Development Plan (2007-2013) (http://ekutup.dpt.gov.tr/oik/plan9.asp, accessed August 2008). The food safety, phytosanitary and veterinary report extensively focused on food safety while the food industry report focused on the preparation of the Turkish food industry for competition in the EU market. It was also highlighted that the competitiveness of the industry for export, through science and technology, should be increased. The food industry report mentioned that quality analyses, R&D activities, consulting and training activities have been major accomplishments during the last decade. The following results have been highlighted in the reports to better prepare the food industry sector during the accession period:

- increase non-governmental organisation and private sector initiatives in the production-consumption chain;
- reduce raw material costs by tax regulations and prevent unregistered production;

- decrease raw material costs via productivity gains and competitive input price for enterprises enabling competitiveness, hygiene and coherence with EU standards;
- constant supply of animal- and plant-based raw material at affordable prices, fulfilling hygiene and safety standards;
- increase of food related R&D activities in public investment expenditure;
- encouragement of industries to invest in science, technology and R&D;
- an efficient control of the food chain from 'farm to fork' by protecting the rights of both the producer and consumer.

Gönenç (2007) published a research paper entitled 'preventive factors which distort the protective mechanism of Geographical Indications'. The author conducted a consumer survey of 570 households in the Bursa Province on Gemlik Olives certified with 'Protected Designation of Origin' (PDO) and a producer survey on Mustafa Kemal Paşa Tatlısı (dessert) certified with PGI. The author also reviewed distinguishing or differentiating attributes of certified products in the official documents. She concluded that the lack of consumer and producer information about GIs and also inefficiently defined distinguishing attributes of certified products are the major factors hindering the spread of GIs.

Gönenç (2006) also published a research paper entitled 'Geographical Indication in European Union and Turkish olive sector and the role of producers' organisation'. The author compared applicants for PDOs in EU Member States and Turkey. She indicated that PDO applicants in the olive sector are cooperatives, chambers of commodity exchange markets and chambers of commerce in Turkey as opposed to cooperatives and producer unions in EU Member States.

Koç (2006) prepared a report on the Turkish food quality management system that includes the evaluation of food safety and quality legislation in Turkey. Moreover, he provided case studies from different sectors such as the tomato processing, broiler and dairy sectors. Finally, he conducted a SWOT analysis on the tomato industry. The report indicated that Turkey has a long history of successful quality management of food safety and quality in certain food sectors, which has been evolving rapidly.

Tekelioglu and Demirer (2008) documented the historical evolution of Geographical Indications (GI) in Europe and compared the EU and Turkish legislation, and the current situation of PDOs and PGIs. They provided an inventory of PDO and PGI certified products by country and commodity groups both in the EU and in Turkey. Moreover, it was also indicated that 60% of Turkish agricultural export earnings are composed of GI protected products such as Giresun hazelnuts, Malatya apricots, Sultani raisins, Ege figs and Antep pistachio nuts.

Available technical reports and studies focus mainly on food safety and highlight the importance of food quality and safety for exports and in the accession process to full EU membership. As seen from the literature review, food quality assurance schemes in Turkey have not been comprehensively analysed, including economic feasibility of quality protected products, compliance cost for producer by scale, factors and policies preventing development of collectively managed quality brand and so on.

Table 9: Implemented projects

Name of the project	Participating institutions and organisations	Source of funding and budget	Period	Objectives	Indications or results
EU programme 'Support to the Quality Infrastructure in Turkey' project	The Under-Secretary of Foreign Trade, Directorate General for Standardisation (DG) and Turkish Society for Quality (KalDer)	€ 13 million funded by the Delegation of the European Commission to Turkey and managed by the European Committee for Standardisation (CEN), through the Expertise Centre (ExC) in Ankara and administered by the British Standards Institution (BSI).	Started in July 2002 and ended in 2007	This project was designed to support Turkish private and public sectors, in the process of technical harmonisation and aligning their quality infrastructure with that of the EU in relation to the Customs Union, more specifically related to technical barriers to trade.	This project extensively focused on standardisation and accreditation, including testing, certification, inspection and metrology. It improved Turkish industries and their perception of quality in the food sector Some food quality issues were covered in the project such as aflatoxin metrology, but it did not deeply cover issues like GIs.
Support to food inspection services in Turkey (first stage)	TKB	- by TKB and financed internally	Started in 1996	The revision of the duties of the Province Control Laboratories and the improvement of their technical and institutional capacity	Accreditation has been initiated (for some of the laboratories involved in tests) by the Food Analyses Performance Assessment Scheme (FASAS) and the Turkish Scientific and Technical Research Council (TÜBITAK). Recently, the general directorate of protection and control, within the TKB, administers 81 provincial directorates, 39 provincial control laboratories and one food control and research institute. Food control inspection services were carried out by about 4 700 food inspectors at the end of 2007. Food analysis services were carried out by about 1 200 food analysis experts.
Support to food inspection services in Turkey (second stage)	TKB	€ 14.139 million with € 10.123 million provided by the EU funded project	Started in August 2002 for a three year period	Aims to increase food production and trade in Turkey by improving methods and procedures for food safety and quality control and conformity testing.	The main output of the project was to increase the analytical capability of TKB laboratories in terms of food safety and quality in line with EU requirements. Fifteen provincial control laboratories of TKB were involved in the project, enabling them to work according to EU standards. Equipment totalling €9 million was provided and laboratory staff received comprehensive training through technical assistance. The project enabled the fifteen TKB laboratories to carry out more analyses. The improvement of analytical capability will increase the quality and reliability of laboratory analyses made by Turkey and bring it in line with those of the EU Member States.
Restructuring and strengthening of the food safety and control system in Turkey	TKB and DPT	€ 11 million (€ 2 million are financed by Turkey)	Started in 2005, and completed in 2009	Aimed at ensuring food safety in Turkey, improving effectiveness in food control systems through assessing duties and responsibilities and the institutional framework of the central and regional organisation of TKB. Also improving cooperation with the private sector in this regard.	Installation of the National Food Reference Laboratory in Ankara by 2008 and procurement of necessary tools, equipment, and devices.

Name of the project	Participating institutions and organisations	Source of funding and budget	Period	Objectives	Indications or results
'Support Standardisation' in Turkey	TSE TÜRKAK	-	Started on 29.01.2005 until 29.07.2007	Aimed at structural and methodological changes of TSE proceedings	Numerous changes were proposed and implemented within TSE, with a view to increasing the transparency of its organisation, facilitating access of the system to Turkish economic actors, and thus harmonising its practice with that of European organisations (http://www.quality-turkey.org/, country report 2006-2007). In 2006, TÜRKAK experts have made study visits to EA member accreditation bodies such as SWEDAC (Sweden), NA (Norway), UKAS (United Kingdom) and RvA (The Netherlands).
TÜRKAK project	TÜRKAK	- supported by Germany	-	Aimed to help TÜRKAK to sign the EA MLA and consequently the ILAC MRA and IAF agreements	TÜRKAK has been a signatory to the EA MLA since April 2006. TÜRKAK has also applied to be evaluated for product certification, EMS and certification of persons. The evaluation was successfully completed in January 2008. TÜRKAK has also been a signatory to the ILAC MRA for testing and calibration since May 2006 and its membership application of IAF was accepted in November 2006.
Other TÜRKAK projects	TÜRKAK	-	since 2000	Aimed to reach international standards	• PTB Project: This is the technical support project from Germany in order to build an accreditation system in Turkey. It started in 2000 and was completed at the end of 2005. • GLP 'Good Laboratory Practice': Twinning project between Slovakian Standards, Metrology and Testing Institution and Refik Saydam Hygiene Center. The duration of the project was 21 months. Inter-ministerial consensus was reached for the national GLP monitoring authority to be established within the TÜRKAK. • EU-MED: A proficiency testing and inter-laboratory comparisons commenced on December 2005 for 19 months. • Awareness raising campaign for Accreditation Project: funded by the EU and implemented by DeLeeuw International and WYG International Consortium aiming to create awareness for accreditation and TÜRKAK. The total duration of the project was 9 months from September 2006.

3. SWOT analysis of the food quality assurance schemes in Turkey

The workshop on 'Food Quality Assurance Schemes in Candidate Countries: Turkey' (FQAS-TURK) was held in Antalya on 7 and 8 October, 2008 in the meeting hall of the Faculty of Economics and Administrative Sciences (FEAS).

The aim of the workshop was to identify the strengths and weaknesses of the existing food quality system in Turkey. In order to fulfil this purpose, institutions related to food quality in Turkey as well as NGOs were invited. Representatives of different departments of the Ministry of Agriculture and Rural Affairs (MARA), the Turkish Patent Institute (TPE), the Regional Exports Union (Antalya), the Undersecretary for Foreign Trade (DTM), the Turkish Standards Institution (TSE), the National Productivity Centre (MPM), the Mercantile Exchange (Izmir), private companies and academics from universities participated in the workshop (Annex C. Participant list).

The workshop was officially opened with the welcome speeches of Prof. Dr. A. Ali Koç and Dean of the FEAS, Prof. Dr. Şafak Aksoy; then Dr. Fatma Handan Giray from JRC-IPTS presented the project 'Economics of Food Quality Assurance and Certification Schemes managed within an integrated Supply Chain in EU' carried out by the Institute of Prospective Technological Studies, one of the institutes of the European Commission's Joint Research Centre (EU JRC- IPTS), and the objectives and structure of the FQAS-TURK project. The morning session was completed with the presentation of Serhat Aşçı summarizing the first phase of the project and providing detailed information about the mechanisms of the current Turkish food quality assurance and outcomes of other related projects and academic reports.

In order to determine the strengths and weaknesses of Turkish food quality schemes, the analysis was made on three basic topics as follows:

1) the gathering of information on food quality assurance certification systems (working principles);
2) existing discussions on and potential interests in EU food quality systems (PDO, PGI, TSG);
3) analysis of potential food products that can compete with those in the EU markets.

In this workshop, a SWOT analysis and a Logical Framework Approach (LFA) were used to collect data from workshop participants. A SWOT analysis is used to identify and categorize significant internal (Strengths and Weaknesses) and external (Opportunities and Threats) factors. Therefore, only Strengths and Weaknesses were obtained directly from participants for the Turkish food quality assurance scheme, and Opportunities and Threats were derived from these answers.

Firstly, the Turkish terminology for food quality assurance was discussed as some organisations were using different definitions for food quality, food safety and food security in Turkey. Therefore, all participants had to define food quality and assurance. Definitions were collected and a common idea was reached with regards to the meaning of these terms.

For the other parts of the SWOT analysis, papers were distributed and, Strengths and Weaknesses were examined in the three parts. Firstly 'information on food quality assurance certification system' focussed on the current situation of the working principles of institutions,

organisations and mechanisms. Secondly 'existing and potential interests to EU food quality systems' looked to current and future expectations of Turkish firms and institutions regarding food quality systems. Finally 'potential food products able to compete with those in the EU markets' elaborated on the competitiveness of Turkish products.

After obtaining the data from the SWOT analysis, Weaknesses and Threats were taken as problems as a basis for the Logical Framework Matrix (LFM) analysis. Problems were listed and the cause and effect relationship between them were established by participants with the support of a professional moderator (Chapter 4).

3.1. Results of SWOT analysis

The analysis procedure was detailed in three parts:

1) the gathering of information on food quality assurance certification systems;
2) existing discussions on and potential interests in EU food quality systems;
3) analysis of potential food products that can compete with those in the EU markets.

Tables were prepared after the discussions according to the opinions of the working group and thereafter, these opinions were clustered.

3.1.1. Information on food quality assurance certification systems

Table 10: SWOT of information on food quality assurance certification systems

	Weaknesses/ Threats	Strengths/ Opportunities
Quality systems	**1) cost** • high cost of food quality assurance systems • costs of packaging, advertising, bar-coding etc. • no additional premium for quality certified products • additional workload and manpower to provide quality • financial insufficiencies	**1) development of quality systems** • increase in ISO 9000 and 22000 accreditations • food quality assurance systems are improving and demand is increasing. • producers with quality assurance systems are the benchmark for the industry • producers and consumers are satisfied with ISO 9000, ISO 22000 and TSE certificates
Institutional	**2) capacity inefficiency** • low capacity of manufacturing entities to obtain quality certificates and to make use of the potential. • lack of the definition of the role of governmental bodies in the administration of quality assurance systems • lack of coordination between governmental institutions • complexity of delegated powers among government institutions • bureaucracy	**2) high interest** • restructuring of related governmental institutions through accession process with EU and close relationship with similar bodies in the EU • sharing of experience with previous candidate countries. • public institutions are working properly and control mechanisms are transparent • control through third parties increase the efficiency of inspections • increase in supplier audits
Consumer oriented	**3) consumer attitudes** • lack of surveys about consumer expectations • consumers are not sufficiently informed about quality • consumer satisfaction is not properly measured	**3) consumer demands** • increasing concern about product information by customers • foreign demand for Turkish products is increasing • quality demand of consumers change according to purchasing power
Producer oriented	**4) lack of interest of food producers** • no premium price of food quality systems • producer/food plant owner are not aware of food quality schemes • traditional producer avoiding changes • difficult application of food quality assurance systems • indifference about agricultural production standards	**4) strong food industry** • create the opportunity for the food industry to export • product diversification of food industry increases competitiveness • qualified personnel is available to apply food quality assurance systems
Accession period	• very slow	**5) adaptation of legislation** • enforcement to international legislation (EU, etc.) • harmonisation with EU legislation • improvements in traceability
Other	**5) terminological aspects** • confusion about definition and concepts of quality • explicit meaning of quality certificates are not known by producers	

3.1.2. Existing and potential interests in EU food quality systems

Table 11: SWOT of existing and potential interests in EU food quality systems

	Weaknesses/Threats	Strengths/Opportunities
Quality awareness and interest in quality	**1) lack of producer and consumer awareness** • lower consumer awareness level compared to developed countries • quality issues not considered due to lack of quality awareness • difference in quality concepts between urban and rural areas • low educational and income levels • trust in quality systems is not established (products from known rural areas are trusted more than certified products) • quality systems are not sought in local markets	**1) increasing interests in demand** • continuing demand for food quality concepts • consumer awareness to sustain product variety and quality • increasing demand for quality products • increasing educational level • trends towards healthy diets • consumer demand for healthier and safer food • increasing awareness regarding nutritional information • increasing income levels of consumers
Communication	**2) communication channels are not used well enough** • information flow is not clear enough • enterprises do not advertise sufficiently • media does not raise public awareness	**2) increasing importance of communication** • raising awareness due to an increasing number of consulting and certification firms • increase in communication channels • variety of communication channels
Institutional/ organisational	**3) lack of implementation inside the institutions** • lack of trust in quality certifications • complicated documentation systems • challenges in converting interest into application	**3) competition in food industry** • entrepreneurship in SMEs • increasing competitiveness • increasing product variety • institutional efforts for improvement • producers' desire to manufacture certified products.
Interest		**4) increasing research and incentives for quality production** • increasing academic interest (R&D) • increasing rural development incentives and support
International agreements	**4) relations with foreign countries** • undefined technical barriers in trade • presence of political barriers	

3.1.3. Potential food products able to compete with those in EU markets

Table 12: SWOT of potential food products able to compete with those in the EU markets

	Weaknesses/Threats	Strengths/Opportunities
Production oriented	**1) low level of production techniques** • standards are not maintained as production according to standard entails costs and may reduce profits • high production costs • uncoordinated production and processing • low number of food plants are able to meet EU standards • high number of small enterprises • limited use of marketing methods • uncontrolled agricultural production e.g. pesticides, hormones • weakened competitiveness in fishery products due to low technology level	**1) production potential** • abundant resources for agricultural production • switching to more efficient production methods • potential to diversify production
Product oriented	**2) lack of infrastructure of internal mechanisms** • lack of support to products able to compete • insufficiency of product-based organisations	**2) large spectrum of products** • growing diversification of production • abundant endemic products • abundant variety in traditional and processed food products (e.g. hazelnut, raisins, apricots, capers, figs, olive oil, poultry products) • great variety of fresh fruits and vegetables • fishery products (sea and inland water) • potential for organic production • traditional products have GI potential (e.g. yoghurts and cheeses) • medical and aromatic plants • Sheep and goat meat and milk
International trade	**3) difficulties in trade with the EU** • political constraints • Turkey is not an EU member (EU import quotas etc.) • absence of a unique legislation in the EU (e.g. fishery products) • both, national and EU standards for production and marketing need to be obeyed • distrust between Turkey and the EU • difficulties to produce in quality levels demanded in the EU • differences in level of development, income and political power	**3) attracting the interest of foreign demand** • agro-eco tourism • tourism increases awareness about different varieties of food products • Turkish living in EU countries • differences with existing EU products; potential niches

4. Logical Framework Matrix (LFM) analysis of food quality assurance schemes in Turkey

At the third stage of the project 'Food Quality Assurance Schemes in Candidate Countries: Turkey' (FQAS-TURK), a workshop was organised in the Culture and Convention Centre at the Middle East Technical University (METU) in Ankara on 26 November, 2008 (Annex D: Agenda and participants list). The aim of the workshop was to inform participants about the previous stages of the project and to elaborate the preliminary Logical Framework Matrix (LFM) obtained from the first workshop held in Antalya.

In order to satisfy the above mentioned objectives, the essential participants invited for the workshop were: SET-BIR (Union of Dairy, Beef, Food Industrialists and Producers), BESD-BIR (Poultry Meat Producers and Breeders Association), TURKYEM-BIR (Turkish Feed Manufacturers' Association), Union of Food and Beverages Industrialists, Consumers' Union, Producer Cooperatives (Koy-koop, TARIS etc), Regional and Central Producer Unions (Dairy, Vegetable, Fruit, Greenhouse etc), Food Safety Association, Organic and Ecological Production Associations, Chambers of Food and Agricultural Engineering. Most of the invited organisations and institutes attended the workshop.

4.1. Methodology

The Logical Framework Matrix (LFM) incorporated opinions, ideas and contributions of stakeholders. Producer organisations, food processing industry associations and cooperatives in the food sector were invited to the workshop in Ankara for a broad contribution. The project team moderated the LFM discussion based on the preliminary LFM which was extracted from previous workshops based on data from the SWOT analysis.

The LFM workshop started with the opening speech of Prof. Dr. A. Ali Koç. Thereafter, Serhat Aşçı presented the outcomes of the first phase of the project on current Turkish food quality assurance schemes, related projects and academic studies. Secondly, the SWOT results related to Turkish food quality assurance schemes were presented by Assoc. Prof. Dr. Hami Alpas and field findings were shared in a presentation made by Prof. Dr. A. Ali Koç titled 'Interest, Knowledge Level and Expectations of Local Stakeholders and Producers from Food Quality Assurance Systems in Turkey'.

The preliminary LFM results were explained; and the specific analysis techniques and methodology were presented. Secondly, the problems of food quality assurance schemes and preliminary sub-topics were detailed by the project team. At that point, opinions and contributions of participants were gathered and some changes to the sub-topics were made for clarification. The preliminary problem list was rearranged according to some minor changes and formed the basis for further work. Moreover, cause-result relationships and major/minor problems, obtained from the preceding work, were assessed and contributions obtained. At the second stage, a problem tree was generated. At the final stage, the audience focused on the LFM table. Each subject was discussed intensively on a matrix table and participants' contributions and opinions for the missing parts were gathered by the project team. Discussion was sustained until each part of the matrix table was approved by the participants. At the end of the workshop, the final LFM was presented once more and participants' final approval was obtained.

Additions to the preliminary LFM are as follows. The issues in the preliminary problem list were not changed but rearranged; (1) 'labelling' was added to consumer trust, (2) 'lack of implementation and auditing after certification process, especially in geographical indications (GI's)', were added to make this point more complete. The cause-effect relationship was deeply discussed and one of the minor problems was divided into two following the discussion with participants: 'legislation' and 'coordination among food chain players'. Thus, the cause-effect table and problem tree were revised with minor changes. Therefore, the LFM was adjusted accordingly. The LFM was also improved with the addition of new assumptions on overall and specific objectives; (1) infrastructure investments to improve food quality assurance schemes will be sustained by TKB (Ministry of Agriculture and Rural Affairs) and related institutes in order to fulfil the demands of the markets, (2) improvement of the quality assurance and traceability system will be sustained according to the demand of export markets, (3) organisation campaigns intended to raise public awareness, supported by sector associations (NGOs), TKB and other public institutes. Moreover, 'traceability applications of food manufacturing SME' was added to the LFM, with measurable indicator, verification tool and assumption.

4.2. Results of the Logical Framework Matrix (LFM) for Turkish food quality assurance schemes

For the construction of a Logical Framework Matrix (LFM), it is essential to list the main issues of the subject of interest. Therefore, a problem list was prepared based on the findings of the SWOT analysis. All weaknesses and potential threats were discussed and reduced to eleven important problems as indicated below:

Problem List:

1. Lack of quality awareness both on the producer and consumer side
2. Export problems due to quality problems
3. Lack of coordination and communication between different entities
4. Insufficient and inappropriate quality certification and labelling audits
5. The quality certification takes time and is expensive (brand, geographical indications (GIs), organic logo, ITU (GAP), etc.). Lack of implementation and auditing after certification, especially for GI's
6. Financial weaknesses of SMEs and agricultural holdings
7. Lack of awareness about national and international quality applications
8. Lack of incentives for quality in production (e.g. GIs)
9. Lack of institutional capacity e.g. R&D (academia, governmental bodies and private sector)
10. Marketing and advertisements are not sufficient even for the products that have a high chance to compete
11. Overlapping of legislation among different implementation authorities

As a prerequisite, bureaucracy and low level of income have not been taken into consideration in the problem analysis since it is not possible to approach these problems in this framework.

4.2.1. Cause-effect relation

The problems were evaluated by participants to detect the main problem and the interaction between problems. Consequently, some problems were found to be the cause or effect of

others. Finally, one main and six minor problems were identified. Furthermore, some changes were made to the description of problems.

Table 13: Cause-effect relation of main and related problems

Main Problem 1. Lack of quality awareness of the producer and the consumer **Cause:** Lack of familiarity with national and international quality application procedures (quality management systems, EU food quality systems [TSG, PDO and PGI], guarantee brands [e.g. wool mark] and others.) **Effect:** Low interest in food quality assurance **Solution:** Improving the food quality awareness level of the producer, consumer and important actors in the food chain.

Minor Problems	**Cause:**	**Solution:**
1. Difficulties in exports due to quality problems	Lack of information, experience, technology, training of producers	Supporting organisational structure and technology use, designing training programmes
2. Conflict in legislation (overlapping)	Gaps and overlapping in distribution of duties and responsibilities between institutions	The authority and responsibilities of the bodies should be reviewed in this respect
3. Lack of trust in quality certification audits and labelling	Lack of resources (technical, human resources, motivation), lack of internationally recognised certification system and accreditation	Supplying the required equipments to the auditors, training of more experts, increasing the budget and extend accreditation efforts
4. Financial weaknesses in SMEs and agricultural holdings	Budget constraints, traditional management methods, certification of quality (branding, GIs, ITU, organic logo etc.) is not affordable (costly and takes long)	Clustering (unit and top organisation), to facilitate credit for small scale firms and grants from international financial sources
5. Lack of incentives towards quality production and products (e.g. GIs) and lack of implementation after the certification process	Lack of organisation on producer level and cooperation in the marketing chain, institutional R&D etc., low interest (academia, governmental bodies, private sector), lack of agricultural support schemes	Designing agricultural support to stimulate quality production, supporting marketing of competitive products and product advertisements
6. Lack of coordination among actors in the food chain	Lack of coordination and cooperation among institutions and key stakeholders in the food chain	Improve coordination among different key sector stakeholders and increase the number of audits by authorized bodies

4.2.2. Problem tree

In the procedure to construct the final LFM, it was agreed that a problem tree could be useful. This problem tree would identify the problem the participatory group considered the most critical. In addition, there is also the identification of the other concerns associated with the main problem and the hierarchical structure. The schema highlights the cause-effect relationship between all the discussed issues.

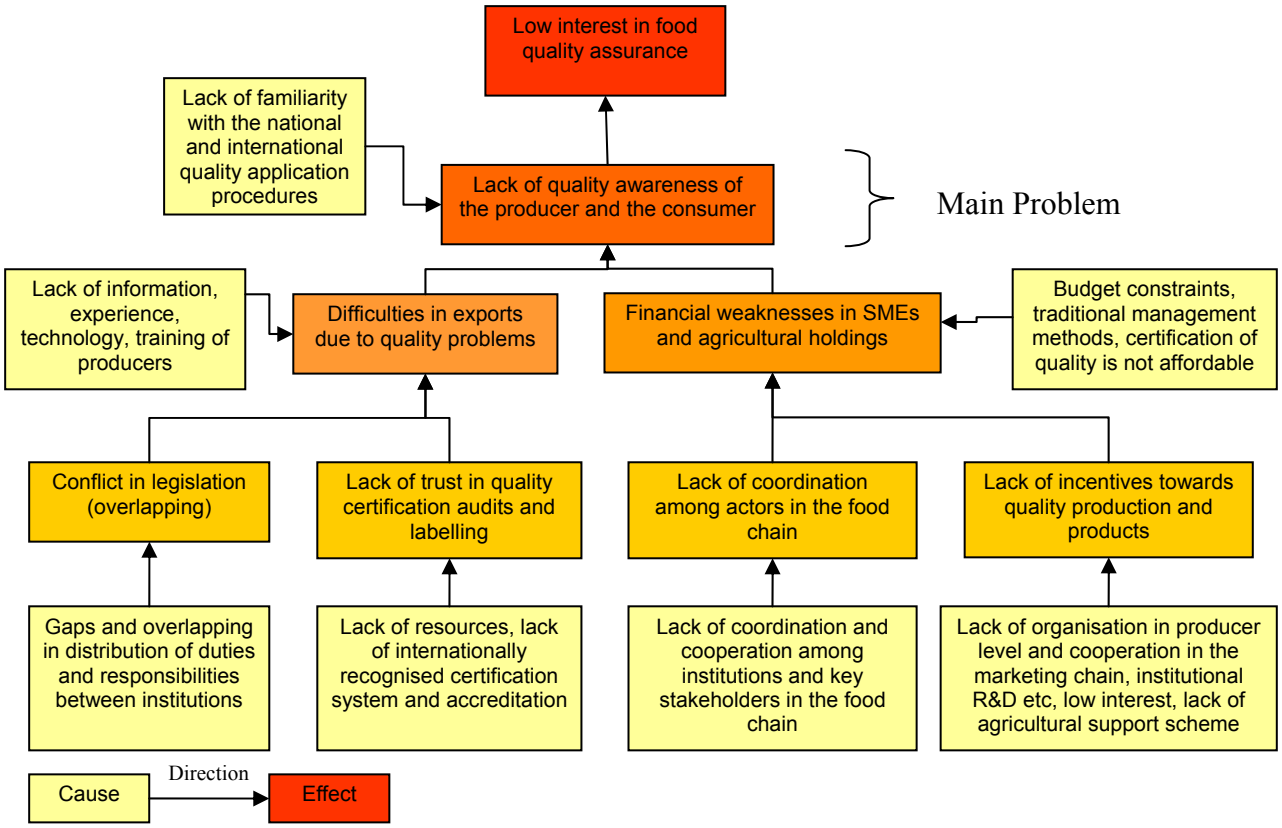

Figure 4: Problem tree

4.2.3. Logical Framework Matrix (LFM): food quality assurance schemes in Turkey

Finally, the LFM was developed using the results of the previous evaluations. As indicated before 'a lack of quality awareness of consumers and producers' was agreed as the central problem requiring solutions. The approach accessed possibilities to overcome specific objectives, and these were spelled out and specific measures attached. In addition assumptions were made which support the overall process but are not always directly linked to food quality assurance schemes in Turkey.

Table 14: Logical Framework Matrix: food quality assurance schemes in Turkey

Overall objectives	**Measurable indicators**	**Verification tools**	**Assumptions**
1. overcome quality problems in exports 2. minimize legislative problems among institutions 3. avoid incapable and unreliable quality certification audits and labelling 4. provide financial support to SMEs and agricultural holdings for quality assurance 5. improve incentives for quality production and products (e.g. PGI, Quality brand) and improve performances and increase frequency of audits after certification 6. support coordination and collaboration among the actors in the food chain			* EU accession period will not be interrupted and adaptation of the legislation will be completed * Infrastructure investments about improving food quality assurance systems will be sustained by TKB and related institutions in order to fulfil market demands. * The improvement of the quality assurance and traceability system will be sustained according to the requirements of the export market.
Specific objectives	**Measurable indicators**	**Verification tools**	**Assumptions**
1. increase consumers' quality awareness	1.1. attract the interest of the mass media on food quality by organising meetings with journalists, making special TV programmes on national TV channels, organising campaigns and increasing primary school students' awareness of food quality 1.2. increase transparency of production in manufacturing plants to consumers	1.1. increase in number of news items in the media, increasing number and duration of programs in TV channels and distributing leaflets to primary level students for education about food quality 1.2. concept, content, time and frequency of organised campaigns	1.1. Institutions like TKB, DPT, TSE, TPE, TZOB* etc. will cooperate and organise meetings on food quality assurance schemes with mass media and journalists, TRT and other national channels will keep the topic 'hot' on their agenda 1.2. cooperation between TKB and MEB* about leaflet preparation and distribution 1.3. organise public awareness rising campaigns, supported by sector associations (NGOs), TKB and other public institutions
2. inform and provide examples to producers, related institutions and other actors in the supply chain about successful quality applications	2.1. organise quality management courses for the producer organisations and related stakeholders 2.2 organise working trips to stakeholders in EU countries	2.1. number of workshops organised for producer organisations and other important shareholders and number attendees 2.2 demonstrate success stories in EU countries on-site to important stakeholders, number of countries (cases) visited and number of people attending	2.1. initiate projects supported by EU and /or World Bank (WB) grants

Results	Measurable indicators	Verification tools	Assumptions
1. design incentives for products appropriate for PGI, PDO or other quality certificates	1.1 enable credit support for products appropriate for PGI, PDO etc. and encourage stakeholders to share common goals	1.1. number of institutional stakeholders and producers that have benefited from the incentives	1.1. TKB will design a support scheme. 1.2. Under-Secretary for Foreign Trade (DTM) will support exports and market research of products with an organic label and a high standard quality level.
2. increase variety and organise marketing of organic products	2.1 increase incentives to improve demands for organic products (product advertisements should be supported)	2.1. number of market offerings made on a planned basis	
3. generalize ITU applications	3.1 support organised producers more than the others	3.1. number of producers that have used the incentives	
4. increase traceability applications in food manufacturing SME's.	4.1 trainee programmes and informing the food sector about traceability issues	4.1. increase in the quantity of SMEs performing a reliable traceability system	4.1. KOSGEB (The supporter association of SMEs in Turkey) and TKB will associate rural development supports with traceability applications

* DPT: Under-Secretary of State Planning Organisation
DTM: Under-Secretary for Foreign Trade
MEB: Ministry of National Education
TKB: Ministry of Agriculture and Rural Affairs
TPE: Turkish Patent Institute
TSE: Turkish Standards Institution
TZOB: Union of Turkish Chamber of Agricultural

5. Farmers' knowledge, perception and interests about food quality assurance schemes: Rapid Rural Appraisal (RRA) results

Information and socio-economic data on producers of selected agricultural products were obtained using the Rapid Rural Appraisal (RRA) method. The data were analysed in order to explore the current status of food quality assurance practices, awareness, knowledge and perception of local stakeholders. To serve this purpose, nine products and twelve regions were selected (Figure 5; Table 15). In each selected region, interviews were arranged with important regional and/or local stakeholders and a representative village (or town), with respect to the overall region was determined during the interviews with key stakeholders such as the provincial agricultural directorate or producers' organisations. The RRA was conducted with producers' panels composed of at least 8-10 participants. The demographic structure of the villages and the farm households, improvements and investments in production techniques and progress in product quality were addressed. A semi-structured questionnaire (See Annex A) was prepared to obtain basic descriptive information and data related to the main aims mentioned above. In the first part of the questionnaire, questions on the demographic structure of the selected villages and the economic situation of the producers were asked. The questions of the second part aimed to explore the knowledge of the producers about their product and its quality as well as the producers' interest in quality issues and their expectations for improvements of their product quality in the near future. The RRA study regions were selected according to the importance of the products in terms of production volume in national agriculture and/or the reputation of the region for the respective products. Interviews aimed to obtain information on the production process, farm structure, developments in terms of food quality and safety, recent production and trade data on representative production regions in the province and/or sub-province. Moreover, the key food players were informed about the FQAS-TURK project and they were invited to the workshop in Ankara where they would be able to share their knowledge and opinions for completing the Logical Framework Matrix (LFM) analysis.

Figure 5: Map of RRA studies in Turkey

Table 15: Selected areas and their importance in Turkish agricultural

Product	Province (sub-province)	Description
Beef	Afyonkarahisar	5.3 % of national registered cattle and buffalo meat in 2005, respectively; two meat products have a GI certificate
Olive and olive oil	Balıkesir (Ayvalik)	Recent data indicates 9 million olive trees, 173 000 tons production and 71 000 hectares; there is also olive oil certified with GI
Tomato	Antalya (Kumluca)	20 % of national production and more than 50 % of greenhouse production and exports
Apple	Isparta (Egirdir)	25 % of national production
Grape and Raisin	Manisa (Alasehir)	30 % of grape production and more than 50 % of raisin production
Dried Fig	Aydın	60% of national production
Dried Apricot	Malatya	More than 90% of national production
Citrus	Antalya (Finike)	Important production location and export points, including Finike Orange with GI certification
Citrus	Mersin	Important production location and export points
Milk	Afyonkarahisar	2.6 % of national milk production in 2005
Milk	Burdur	1.7 % of national milk production in 2005
Milk	Konya & Karaman	About 5 % of national milk production in 2005; including a local cheese with GI certification

In light of the information obtained from the interviews with key local stakeholders, the semi-structured survey was conducted in the most representative and/or popular production sites of the selected province or sub-province. The producers of the selected products in villages were invited to a round table discussion at the Village Headman House or Village Café and the RRA study was carried out by filling in the form during conversations with the group. Each semi-structured completed questionnaire form in the selected areas (RRA Instrument) is summarized with the additional information obtained about the location and the products from key stakeholders during the interview.

5.1. RRA study reports

5.1.1. Afyonkarahisar – milk and beef

Afyonkarahisar plays a major supply role in beef and veal, meat products and milk (including water buffalo milk). According to the Provincial Directorate of Agriculture, the number of cattle was 283 979 and of water buffalo was 2 532 in 2007. The 2007 production was 259 676 tons of milk and 20 522 tons of meat (including beef, veal and sheep) and the number of cattle and sheep slaughtered were 88 796 and 17 841 respectively. The total milk production of Afyonkarahisar contributed 2% to the national production. There were 34 milk production plants, of which 24 had applied for milk incentive premiums and were supported for around 59 275 tons of milk by the Provincial Directorate of Agriculture in 2007. Approximately 23% of the milk produced was marketed by plants that comply with the minimum required technical standards (i.e. hygiene, quality control etc.), the primary requirement to be supported.

The registered annual production in 2007 equated to 2 366 tons sucuk (Turkish type sausage), 832 tons sausage, 369 tons salami, 94 tons pastrami (dried meat), 126 tons kebab, 297 tons kavurma (roasted meat), 27 tons ham, and 2.4 tons burger meat.

As of 24 November 2008, there were 137 308 registered cattle; of which 42 772 were attributed to the pedigree system (including 20 278 cows) and 94 536 to the pre-pedigree system (including 60 956 cows and 14 820 bulls). 2 112 farmers (4 cooperatives and 5 private companies) were registered to the pedigree system and 24 745 (8 cooperatives and 5 private

companies) to the pre-pedigree system. According to these figures, each farmer had an average of 20.3 cattle of which 16.6 were cows.

There was no application for organic farming and GAP (good agricultural practices) for animal breeding. However, organic fruits, flowers and other vegetables were grown on around 328 ha by 296 different producers.

Afyonkarahisar Chamber of Commerce has three GI certificates for Afyon Sucuk, Afyon Pastrami and Afyon Milk Cream. A supervision team has been formed and a hologram has been designed for meat products (especially for sucuk). Managers that were contacted have claimed that the leading firm-brands in the region like Cumhuriyet, İkbal, İpek do not volunteer for use of this hologram as they mostly believe that their brand is much better known than the GI hologram. Another reason is the lack of traceability of those firms that use this hologram. However, this may still be an incentive for some SMEs which could not achieve to be a brand.

In the province, an association (ASEMSU) was formed in 2006 to bring together producers in the area and it currently has 20 members. ASEMSU prepared educational panels to instruct and train for hygiene, ISO-22000 and HACCP.

RRA (Susuz village)
Susuz is 15 km from Afyonkarahisar with around 1 000 households and a population of 6 000; the majority work for the government and local industries. The major products are wheat, barley and clover for feed, milk and cattle. The producers market the cereals to the flour and feed factories in Afyonkarahisar, milk to local dairy plants (via mobile milk collectors) and beef cattle to the meat processing plants. An irrigation cooperative is present in the village and, in addition, there are 23 farmers registered in the 'Cattle Breeders' Association' (CBA) in Afyonkarahisar. This association does not perform any activity for marketing milk products but helps producers in terms of veterinary services, artificial inseminations, feed supplements and marketing of breeding cattle. The annual income of an average household is around 7 000 TL of which 70-80% originates from agriculture.

Producers use the words 'hygiene' or 'healthy products' when defining the term 'food quality'. Their basic information is obtained from the nationwide milk plant veterinarians.

They do not have organic farming in the village, but are partly aware of it. The farmers are not informed about Good Agricultural Practices (GAP) and GIs and there is also no intention of carrying out organic production or GAP.

The average number of dairy cows in the village is about 10, and 23 farmers have more than 10 cows and 100 of them less than 10. Around 70 farmers are specialised in beef cattle with an average of 10 animals and the average land for producing corn and/or clover for feed is around 1 ha.

It has been observed that during the last decade the number of dairy cattle increased. Moreover, farmers without tractors have left agricultural production. There is an improvement in production technologies (artificial insemination, machinery, veterinary services, and efficient milk production) and an increase in production of milk that fulfils the Turkish codex requirements. However, the intention to increase the quality of production is not significant because of the increase in production costs. There is also a decrease in the net profit from

agricultural products (meat and milk) basically due to input prices that increase more so than the output prices (milk price versus feed costs and veterinary services).

The advantages of producers are their closeness to the market and cheap manpower whereas the disadvantages are the lack of water and pasture areas.

Farmers have been investing in barns, machinery for silage and milking; more than 50% already have milking machines. The basic source of investment capital is from their own sources.

RRA (Küçükçobanlı Village)
The village has 85 households and the population is around 750. The major income sources are animal breeding (water buffalo, dairy cattle and beef cattle) and vegetable production. Producers sell the wheat to flour plants and barley to feed plants. Milk from water buffalo is used for milk cream and the remaining part is used for a special type of filtered yogurt that is marketed in Afyonkarahisar. The milk is sold to regional collectors and sometimes to nationwide plants. Beef cattle for meat are sold to regional plants. Villagers place their annual income at around 8 000-10 000 TL per household. The agricultural development cooperative has 30 members; the irrigation cooperative has 47 members in the village. The majority of farm households earn all their income (100%) from agricultural activities. Around 15 people work in Afyonkarahisar and commute on a daily basis.

The major understanding of food quality is hygiene. The special product of the region is milk cream from water buffalo milk as the region is geographically suitable for water buffalo. The producers' association is looking for alternatives to build a milk cream production plant for the village and looking for support from the Provincial Directorate of Agriculture and university. The price of water buffalo milk is double the price of cow milk and it is generally used for yoghurt or milk cream production. The quality of milk cream cannot be audited and a pure product is rarely found (often mixed with cow's milk).

Organic agriculture is understood to refer to production without fertilizers and pesticides. Farmers have no information about GAP, and no intention of farming organically. Farmers have heard about the GI of Afyon Sucuk and Pastrami but are not aware what this means exactly nor of its potential advantages. There are about 80 farmers that own at least 20 beef cattle and the production method is in open pasture and barns.

Large breeding plants in Afyonkarahisar
Coşkun Meat and Products Inc.
The firm has two modern farms in Istanbul and Afyonkarahisar (founded in 2003) with a capacity for around 5 500 cattle and it currently has around 3 800 animals (600 water buffalo and the rest beef cattle). There are 2 500 water buffalo in the Istanbul farms, 36 workers are present on the farm with full automation. The barns have concrete floors and are very clean. They have no own feed production. All feed for animals is packed and stored in separate stores. Entrance is restricted and the firm obtained ISO 22000 (in 2008) and also an ISO 9001 certificate.

Plants producing meat products (İkbal and Cumhuriyet)
İkbal Meat Products Industry was founded in 1990. The name comes from a famous city restaurant founded in 1922. The plant has a slaughtering capacity of 500-600 cattle per month around 30% of this figure are water buffalo.

The net meat weight of the slaughtered cattle, water buffalo and dairy cow are around 300, 230 and 300 kg respectively. Meat is sold fresh and used for processed meat such as sucuk, sausages, pastrami, salami, ham, kebab, meat burgers and roasted meat. Fresh meat is sold to hotel chains and also to grocery shops that the plant owns in Istanbul. İkbal has a franchising system, with around 27 restaurants and basically selling cooked meals, kebabs and a famous Afyon kaymaklı kadayıf (a kind of dessert made from stale bread, sugar syrup and served with milk cream from the region). The firm has ISO 9001, HACCP (since 2004) and ISO 22000 (since 2007). İkbal mainly considers the age, weight, registration (of the animal) and appearance of the cattle before purchasing and slaughtering. The firm employs veterinarians and food engineers, and live animal suppliers are evenly shared between large firms and small farmers. The firm does not sell bulk meat and has a plan to construct a plant with a capacity of around 1 500 tons of meat/month. Nationwide marketing chains sell the firm's products.

Cumhuriyet Meat Products Industry was founded in 1928 as a small producer and opened the current modern plant in 2005. On average 200 cattle are processed per day but the capacity is around 500. The processed meat products are sucuk, pastrami and fresh meat. The firm has vendors in many cities and it owns a big restaurant near a major highway and in Afyonkarahisar. Meat products are sold in all major marketing chains nationwide such as Migros, Tanşaş, Kiler, Real and Metro, and fresh meat is also sold to traders in Istanbul. The firm does not have HACCP and ISO 22000 but has applied for certification. Marketing chains like Migros and Real audit the firm on a periodic basis and the firm is trusted for its brand name.

5.1.2. Balıkesir (Ayvalık) – olives and olive oil

Ayvalık is located south of Edremit Bay in the Balikesir province of the Aegean region. The main source of income is domestic tourism and olives/olive oils. There are approximately 4 800 olive producers with 1 800 000 olive trees on 16 000 ha. Only around 1% of the producers have more than 1 000 olive trees. Olives can be picked intensively in two years; the yields of two successive years are approximately 50-60 kg/tree and 12 kg/tree, respectively. About 95% of the olives are used for oil and the rest is for direct consumption. On average, the oil yield is 1 kg of oil from 7 kg olives but sometimes it could increase to 1 kg of oil from 5 kg olives as occurred in 2008.

The main problems are olive moth and olive fly. Until the ban in 2006, TKB used pesticides sprayed from the air for the olive fly on all trees in the region. To protect olives from the moth, producers use pesticides during the development of the fruit. Another problem of the region is sloped terrain (more than 80%) which results in short and small olive trees and reduces the possibility of irrigation. However, trees on flat land, from which the olives are used as table olives, are irrigated by a drip system.

Ayvalık Chamber of Commerce (CoC) obtained the Protected Designation of Origin (PDO) certification for olive oil in the Ayvalık region in 2007 following a costly four year procedure. In addition, TARİŞ also holds a PDO certificate, covering an area from Çanakkale to İzmir including Ayvalık. In the Ayvalık region, the CoC has been actively promoting the use of the PDO. Firms have to apply to the CoC for the use of PDO holograms and products should pass annual chemical and sensory analyses carried out by eight experts. To qualify, experts must

be trained by the 'Olive Friends Association'. In 2008, 15 different plants applied for the use of PDO holograms and 14 of them were approved.

Although there are transaction costs for obtaining the PDO certificate and producing in accordance with the norms, firms cannot sell their products at a premium price. Therefore, the use of PDO holograms is only to gain consumer confidence and strengthen the brand's name. The CoC also organises a harvesting fair each year, where tasting panels and other activities are carried out to advertise the Ayvalık olive oil brand and support the olive oil market.

RRA (Akçapınar village)
Akçapınar is a mountain village in the Ayvalık district with 500 households and a population of 1 200. The main source of income is olives for olive oil production, with a few trees planted recently for table olive production. In addition, goats are raised for own consumption and okra is also cultivated as a cash crop. Olives are sold to the cooperative's plant (TARİŞ) or nearby merchants or olive oil plants. TARİŞ belongs to an agricultural marketing cooperative in the village with 100 members, with activities on olive marketing and providing an advance payment in the form of a credit of around 3 000 TL per ton, based on the average quantity of the olive oil delivered to TARİŞ in the last 3 years. The annual income of a household exclusively from agricultural activity is around 6 000 TL. Farmers also work as labourers in the olive gardens of the olive oil factories and merchants. In employment women normally earn 50% less than men.

The acid content of the olive oil is described as the food quality in olive oil by the producers. The difference of this region's olive oil is claimed to be due to climate and soil composition. Therefore, olives grown in the Ayvalık region yield more mature olives and give more oil. Farmers have no idea how to distinguish their products from others, and claim that olives and olive oil have been transferred to Ayvalık from other regions (like Aydın), processed in Ayvalık and marketed as Ayvalık olive oil. Ayvalik farmers also claim that their product is superior in terms of acidity, taste, shelf-life and colour among its competitors.

Production without using chemical fertilizers is described as organic farming; farmers have no knowledge about GAP and have not heard of geographical indications. There is no organic farming or GAP applied in the region.

There are around 450 producers with on average 1 ha each; only 10 have more than 5 ha and 45 less than 1 ha of land. Intermediate-dwarf trees are used for common production.

Producers claim that the average land owned by producers has been increasing during the last decade. Some farmers have invested in drip irrigation systems, use new pesticide management systems and plant different kinds of olive trees. In recent years, new pruning methods, expansion of irrigation and efficient use of pesticides caused an improvement in the olive oil quality. Profits from olive production have declined due to inflation, an increase in input costs, a decrease in selling prices and droughts. With regards to input costs, the price of pesticides and fertilizers in particular has increased and therefore the application has been reduced. Another important increase in input cost is due to rising diesel prices.

Advantages of Ayvalık olive oil production are: proximity to the seaside (climate), soil (with clay), workforce and experience, whereas disadvantages include lack of irrigation facilities, organisational weaknesses, sloped land and small farm size.

Producers invested in forming new olive orchards (at a cost of 250 TL/ha) and purchasing automatic machines for pesticides (15 000 TL/ha), where 50% of the machine is given as aid by TKB to the farmers.

5.1.3. Antalya (Kumluca) – tomatoes

Kumluca in the Antalya province is the leader in greenhouse production of tomatoes in Turkey. Tomatoes are produced in 24 villages and 3 small towns belonging to Kumluca on 3 700 ha in greenhouses (plastic and glass covered). Around 7 500 farmers deal with greenhouse production. The overall population of Kumluca is of 70 000, of which 12 500 are farmers. In addition, green peppers and eggplants are also produced in greenhouses in the region. In Antalya province 1.7 million tons of tomatoes are produced and Kumluca contributes 600 000 tons, around 40% of the total for export. This has also supported the development of related industries in the region, such as 104 pesticide suppliers, 13 seedling production plants and 3 different wholesale markets, which are very busy in export seasons.

Greenhouse production began in the 1980s and it has expanded to cover almost the entire Kumluca Valley. The region outside the Kumluca Valley does not produce tomatoes, therefore other vegetables like eggplants, peppers and fruits (citrus and pomegranate) are produced in these areas.

The main factor affecting production is the considerable age of the greenhouses, which increases the risk of viruses and thus requires the use of more pesticides. On the other hand, the experience (know-how) gained over 30 years and the well-developed marketing structure are the main advantages.

RRA (Sarıcasu village)

The village has 1 000 households and 3 500 people and is linked to the central town of the Kumluca region. The main source of income is greenhouse production (the majority being tomatoes, followed by eggplants and peppers) and 60% of fresh tomatoes are exported. There is no active producers' cooperative or organisation. The producers' association and chamber of agriculture are present in the district centre but not very active in nearby villages. The average annual income of a household is around 10 000 TL, almost entirely from agriculture. In addition, a few people work in packaging plants in the export season or have small village groceries.

Hygiene and products without pesticide residues are the main aspects understood in terms of food quality. Products of this region (especially tomatoes) are believed to be different from other regions due to the climate. Using the 'region name' on the packaging material is believed to differentiate from other products. Moreover, tomatoes from nearby regions like Serik and Demre are claimed to be marketed as Kumluca tomatoes. Tomatoes produced in Kumluca are distinct in size, smell and taste.

Farmers perceive organic farming as pesticide-free production and some confuse it with agriculture without soil. Farmers have no information about GAP or GIs, although nearby Finike Oranges are known to them as GIs. There is no interest in organic farming or in GAP in the region but some large producers are farming without soil (hydroponic). They have accepted systems and technologies but the costs are too high for them to cover. The average size of greenhouse production is about 0.4 ha.

Producers reported that the average greenhouse size has been increasing recently due to large producers entering the market. Some small producers have left the sector as a result of difficulties with repayments to bank creditors and other agents. Production technologies used have been improved, for example building high tunnel greenhouses, high air ventilation systems, using seedlings and Bambus bee nets. In addition, the use of vaccinated seeds (resistance to diseases) and greenhouses with high air ventilation systems (reducing the need for pesticides) also increase product quality. Net profit is lowering due to inflation and high input costs and the constant sale price of the final product.

The advantages are the climate, soil composition and experience whereas the disadvantages are disease and low resistance of the soil to diseases.

Producers have invested in greenhouse renewal (air ventilation systems, ventilation, drip irrigation systems, using seedling and grafted seeding etc). Investment costs for a new greenhouse is around 150 000-200 000 TL/ha. The capital investment is generally financed with bank credits. The capital for seedling and other inputs are supplied by the Agricultural Credit Cooperatives. If they need fixed term payments they may choose pesticide dealers and for cash advances they can obtain the money from agents in the wholesale market.

5.1.4. Isparta (Eğirdir) – apples

The annual apple production of Turkey is around 2.5 million tons from a total of 34.5 million trees and Isparta has a share of around 12.5% in terms of apple trees and 20% in terms of apple production. In the Eğirdir district (sub-province), the cold-storage capacity is around 130 000 tons/year and most of them do not have controlled-atmosphere storage facilities. However, there is a constant increase in the number of cold-storage houses with controlled-atmosphere and sorting/packaging units. As an example, in Eğirdir, the Agricultural Development Cooperatives have such cold-storage houses with a capacity of almost 50 000 tons/year.

The districts growing apples are Eğirdir, Gelendost and Senirkent. Eğirdir produces 50% more than the others. The main varieties are Starking and Golden (around 85-90% of the orchards). There are no attempts at organic production or GIs but in some villages there are GlobalGAP applications.

The average age of apple orchards in Eğirdir is more than 35 years, meaning they are towards the end of their economic life cycle. The average size of farms is 1-1.5 ha. New organisations, like Agricultural Developing Cooperatives, have been emerging in the region and started to play an important role in marketing. The formation of cooperatives is concentrated in villages between the two lakes, Eğirdir and Kovada, (namely Serpil, Tepeli, Akdogan, Yukarı Gökdere, Ağılköy, Eyüpler, Yuvalı and Balkırı) which specialise in producing apples. In each of the 8 villages there is a cooperative, with in total 1 417 members. There are cold-storage houses in each village with a total capacity of 38 000 tons and 5 villages also have sorting/packaging units. In addition, some cooperatives have invested in common drip irrigation systems for their apple orchards and are investigating technological opportunities for quality improvements. Cooperatives are working with wholesale agents and those with sorting and packaging facilities directly serve nationwide marketing chains like CarrefourSA, Real, Diasa and Tesco-Kipa.

RRA (Eyüpler village)

Eyüpler village in Eğirdir consists of 85 households and 310 people, with a high percentage of incomes derived from apple growing (90%). Some farm households also have cherry and peach trees and very few breed goats. Apple varieties are generally Starking (60%) and Golden (40%). Products unsuitable for storage are sold to the close by fruit juice plants. The remaining part is stored and served to local markets. The Agricultural Development Cooperative in the village has 39 members and has a 5 000 ton capacity of cold-storage rooms. The marketing of stored apples is usually carried out by the cooperative. The average annual household income is around 12 000 TL, all earned from agricultural activities, particularly apple growing. Some young inhabitants also work in fruit juice plants during the seasonal harvesting periods.

Producers understand hygiene and product standards as food quality. Apples are the special product of the region where the basic characteristics are due to the microclimate in the valley between two lakes and two mountain ridges. Apple cultivation started during the 1960s in the region and it is now one of the leading areas. Producers have not made attempts to distinguish any characteristic features of their products due to bulk marketing. Besides, they claim that apples from other parts of Turkey (e.g. Maraş apples) are brought to this region to be marketed as Eğirdir apples. Producers have also reported that apples produced in Eyüpler are superior in terms of taste, acidity and appearance (shiny, oblong).

Organic farming is perceived by farmers as growing apples without using chemicals and fertilizers. Experience with GlobalGAP (formerly EurepGAP) started two years ago with governorship support but ended as no price premium was obtained. Producers are not aware of GIs and claimed that GlobalGAP (or GAP applications) can be retried in the village if it is profitable. They are also attempting to establish traceability systems for their products by using software with the support of the District Directorate of Agriculture in Eğirdir. Producers believe that these kinds of systems can result in a decrease in production costs.

There are 130 producers with an average of 1.5 ha farm area in Eyüpler. Among these, 10 have more than 5 ha, 30 between 2 ha and 5 ha and 15 with less than 1 ha. Drip irrigation systems are common in all orchards and trees are generally half-dwarf conventional varieties.

During the last decade, the scale of apple farms has not changed much. Recent developments include establishing new cold-storage rooms, drip irrigation systems and using tractors in farming. In addition, some production techniques, like fruit thinning methods, are also experimented with to increase the product quality. Producers' organisations in the form of cooperatives have increased in importance. Net profits are lowered mainly due to inflation and input costs (fertilizers and others).

The advantages in apple production are climate, water and closeness to processing plants and disadvantages are humidity, frequent precipitation and soil composition.

Farmers have been supported in investments in establishing irrigation systems (4 500 TL/ha-45% subsidy), replanting apple orchards (20 000 TL/ha-50% subsidy), constructing cold storage rooms (bank credits) and fencing for wild animals (50% governor subsidy).

5.1.5. Manisa (Alaşehir) – grapes and raisins

Alaşehir is a district in the province of Manisa and is one of the main areas where seedless grapes are grown. According to the information gathered from Alaşehir Directorate of Agriculture, there are 19 500 ha of vineyards in the areas giving a total of 2 250 000 tons of fresh grapes. Around 316 000 tons of raisins are produced from some of these fresh grapes and 250 000 tons of the raisins are exported. The conversion rate is 1 ton of raisins obtained from 4.5-5 tons of fresh grapes. Around 65-70% of the grapes are used for the raisin production and the rest is marketed as fresh and also used in wine or alcohol production.

The main source of income in 30 of the 65 villages located in the district is grape production. A total of 5 000 producers farm on vineyards of an average of around 1 ha. The yield is around 30 tons/ha. In a well designed vineyard it has been reported that yields can be increased to around 100 tons/ha by using modern techniques like high trellis systems and by drip irrigation systems (however only about 15% of the total production area uses this type of irrigation).

There are around 50 packaging and processing plants for exports. Firms focusing on fresh grape exports have been building plants in this region since 2000 and they also use their packaging units for other products, like strawberries, cherries etc., produced in this region.

According to the interview with TARİŞ officials in the district, the main quality problem in grape production is pesticide residues. A pesticide laboratory with nine workers has been set up with the support of Alaşehir Mercantile Exchange and Intertek (an international firm). The aflatoxin problem is not a common problem unless it rains heavily during the growing season. Farmers are trained by agricultural engineers to overcome the problem. Moreover, farmers are curious about the effects of cyanide used in gold mine processes on the quality of grapes.

Recently, there has been no governmental support to grape production. However, during the 1970s the construction of concrete platforms for raisin drying was supported, and some of them are still in use. Nowadays, new multi-storey fenced drying systems increase the raisin quality but their construction is not supported. The interest in grape production is increasing in neighbouring Buldan (Denizli).

The storage of raisins can be extended to two years in a controlled atmosphere provided that the pre-drying is done correctly. The largest storage house belongs to the TARİŞ cooperative where members' average vineyard size is around 1.6 ha, higher than the region's average. A family with four members should have a plot of at least 2 ha live sustainably from grape production, therefore it is expected that some small producers may leave production in the near future.

There is no organic production in this region but 20% of the producers comply with GlobalGAP with the support of export firms based on contract farming.

RRA (Bağlıca village)

Bağlıca village has around 550 households with 1 600 people where all residents' main source of income comes from vineyards. Almost 40% of the grapes produced are sent to wineries. The remainder is seedless white grapes and 85% are marketed as fresh and 10-15% as raisins. The commercial products of the village are grapes and cattle breeding (performed with the help of agricultural development support in 70 farm households). There are Agricultural Credit and Agricultural Development Cooperatives in the village with 400 and 70 members

respectively. These cooperatives are not active in the marketing of grapes. The average household income per village resident is 7 000 TL/year, all of which is agricultural income.

Producers understand hygiene and product shape as food quality. The special product of the region is the seedless white grape. The special differences to other regions are the soil composition and low boron content of the water used for irrigation. Farmers also indicated that a strong producer's association and using the brand name of the association may be beneficial in terms of differentiating themselves from other regions. Nearby regions sell products with reference to the same origin. However, products of the Alaşehir district are superior in terms of taste, appearance (larger) and shelf-life, and can therefore be marketed at about 50% higher than their rivals.

Producers cannot define organic production and have no information about GAP; they have only heard that large producers apply it. They also have no information or even idea about GIs. There is no land in the region suitable for organic production. Contract farming with large customers requires specific production techniques (as for example GAP). Overall all these systems are seen as opportunities and believed to increase the market share and sale price.

There are around 400 producers with an average vineyard size of 3 ha. Among these 5-6 producers have more than 10 ha and 100 have less than 1 ha. The common method of vineyard plantation is building high trellis systems.

The average size of the vineyards has been decreasing during the last decade and producers have tended to switch to high trellis systems, drop irrigation and new varieties in recent years. In addition, covers are increasingly used to prevent rain damage and pesticides are used with the utmost care to increase quality. TARİŞ requires a minimum amount of grapes to be handled in order to grant membership, which reduces the opportunity for coordination among smaller producers. There is also an increase in the number of merchants and export firms in the region. There is a loss in net profit due to inflation and increased input costs.

The advantages are climate, soil, groundwater availability and workforce experience, while disadvantages are lack of coordination and the presence of a gold mine (cyanide use).

Recent investments are installing a high trellis system (50 000 TL/ha) and drip irrigation systems (5 000 TL/ha) and are mainly financed from personal capital.

5.1.6. Aydın – figs

The economy of the province of Aydın depends on agriculture and industry. According to the data and information from Aydın Provincial Directorate of Agriculture, the main agricultural products of Aydın are figs, olives (gemlik olives), chestnuts, strawberries, cotton, corn, feed grass and animal breeding. Though figs are produced almost all over the province the special figs for sun-drying (yellow-lobe) are produced in the Germencik and Incirliova districts. There are around 6.5 million fig trees on 39 678.2 ha with 30-40 thousand producers. The overall dried fig production of Turkey is around 45-50 thousand tons, of which around 70% are produced in Aydın. The drying yield is around 1 kg dried figs from 5 kg fresh figs, and pre-drying figs are placed on a wire-shelf above the ground where they are left under direct sunlight (called kerevit). Water content is reduced to around 30% during sun-drying and thereafter in processing plants it is further reduced to 20% for final use. Around 95% of dried

figs are exported and the rest is sold on the domestic market. Figs are harvested between mid-August and mid-September. Processing plants, including 120 large ones, elaborate the produce (dried figs) until December of the same year.

The main quality problem in dried figs is aflatoxin due to contamination with soil fungus during open air drying. Aflatoxin content is periodically checked in exported products but not for those destined for the domestic market. The Exporters' Association only compensates additional costs for products containing aflatoxin following pre-checking. According to data in 2008, around 1% of the products are expected to contain aflatoxin. Fig trees are mainly grown on mountain slopes and no pesticides, or fertilizers are applied, only animal manure. There is no irrigation system on the slopes; therefore the quality of figs depends on the amount of rain. Figs do not grow well enough if the average annual amount of rain is below 630 l/m^2. Even though the above mentioned method of fig production is very close to organic production there are currently no producers licensed for organic production. There is no specific governmental support for the production or exportation of figs.

Aydın Chamber of Commerce has the Protected Designation of Origin (PDO) for yellow-lobe (Sarılop) figs from Aydın; however, its common use has not started yet. TARİŞ Fig Association has planned to use the holograms on its 2008 produce packages. Officials dealing with the PDO procedures have indicated that the main purpose of obtaining PDO for yellow-lobe (Sarılop) figs from Aydın is to prevent unfair competition and to increase profits. The main characteristics of Aydın figs are their thin skin, sweetness, light colour and shape. Izmir Mercantile Exchange has also obtained a PDO for dried figs covering the entire Aegean region (also including Aydın); however, the PDO is until now not utilised.

TARİŞ fig unions have around 5 000 members in 15 cooperatives. It organises training courses for its members on tree maintenance, production, harvesting, pruning etc. There are approximately 400 workers operating in the processing plant of TARİŞ in Germencik and they processed 4 000 tons of dried figs in 2007, 70% of them were exported and the rest was sold on the domestic market.

RRA (Çarıklar village)

Çarıklar village is a mountain village in the Germencik district. The village is located on a mountain chain, between Aydın and Izmir, with 165 households and a population of 482. The main source of income is agriculture and the main products are figs (70%) and olives (30%). Figs are the yellow lobe (sarılop) type suitable for drying and olives are generally used for olive oil production. Each household also has 1 or 2 cows for their personal milk and cheese consumption. Producers sell figs and olives, preferably to TARİŞ or to merchants (lower price but cash payments). There are two different cooperatives, one for figs (120 members) and one for olives (80 members) in the village and they play an active role in the marketing of the products. The cooperatives give an advance of 1.5 TL/kg for figs and 2 TL/kg for olives to their members as corresponding to the producers' previous year delivery. The average annual household income is around 4 000 TL, mostly from agricultural production.

Producers understand food quality to be natural and special produce, and the regional speciality are dried figs. Villagers claim their figs are special due to the geographical and climatic characteristics (mountain slopes and wind). Producers could not indicate how to show the difference of their products from others. They have claimed that other figs around the region -from other valleys in Aydın and Izmir provinces- are also marketed as Aydın figs.

In addition, the dried figs of this region (located on the mountain chains) differ from others due to their skin thickness, taste and appearance (whiteness).

Organic farming is described by local producers as agriculture without fertilizers and pesticides; they have no opinion on GAP or GI. It has also been reported that chemical fertilizers are not used every year.

All producers, dealing with fig (1.6 ha) and olive (0.9 ha) production, work on steep land without irrigation.

Producers also indicated that, despite the fact that the size of the processing plants did not change in the last decade, the number of fig trees has decreased due to droughts. They are well-organised in agricultural marketing cooperatives and new pruning and drying (kerevit usage) methods have recently become more widely applied. They also reported that net profits have decreased in recent years, mainly due to the rise in input costs compared to the output price, but also due to droughts.

Advantages are recorded as climate, soil and workforce. Disadvantages are defined as joint title deeds, no opportunity for irrigation, a fungus disease which desiccates fig trees and the lack of a suitable credit opportunity for replanting. Producers have themselves invested in planting trees in recent years, mainly from their own savings.

5.1.7. Malatya – apricots

Apricots are grown all over Turkey except in east Anatolia where severe winter conditions occur and in the east Black Sea region because of high humidity. The Malatya region supplies around 60% of Turkey's overall apricot production and 7-10% of the world's apricot production. Almost all apricots obtained from Malatya are dried and 90% are exported. Turkey has a share of around 80-85% in the world dried apricot market. The common important variety is Hacıhaliloğlu and 70% of the trees are of this variety. Hacıhaliloğlu is the most important variety used in drying. Other varieties like Kabaaşı, Soğancı, Çataloğlu and Çöloğlu are also planted. The total plantation area is around 72 000 ha and the estimated number of trees is 7 million. Organic farming is applied on 24 000 ha.

The annual production is around 600 000 tons. The export revenue in recent years reached up to 150 million USD where the annual amount exported is around 70 000-100 000 tons. Around 50 000 households work in apricot cultivation in the Malatya region. As a result of an application made by Malatya Chamber of Commerce in July 2000, accredited in January 2001, the Malatya apricot obtained the status of PDO. The scope of this PDO includes Malatya province and Baskil district (Elazığ province), Gürün district (Sivas province), Gölbaşı district (Adıyaman province) and Elbistan district (Kahramanmaraş province). The main characteristic of Malatya apricots is the high dry matter content, of 23-25%, compared to around 15% for apricots grown elsewhere in Turkey and the world according to the Fruit Research Institute. Therefore this type of apricot is very suitable for drying and preserving and impedes the mixing with other dried apricots.

The Provincial Directorate of Agriculture, the Fruit Research Institute, the Apricot Research Development and Presentation Foundation, the Apricot Cooperative, Malatya Chamber of Commerce, South Eastern Anatolia Exporters Association, the Apricot Producers Association

and Governorship of Malatya all deal with coordination of apricot production and marketing in the Malatya province.

The Provincial Directorate of Agriculture indicates climate as the main factor affecting the yield and also the amount of sulphide to be used. Late spring freezes can negatively affect the quality. Colour changes during the drying period and using sulphide prevents the enzymatic activity responsible for darkening. It also prevents moulds, yeast, microbial and other insects due to its antimicrobial nature. The EU accepts a sulphide content of 2 000 parts per million (ppm) and the USA 3 000 ppm. Producers claim that they cannot use less sulphide than the traditional basis-level. On the other hand, packaging and processing plants claim that producers overuse sulphide, in consequence they cannot meet a homogeneous level in processing and extra costs are incurred to meet the standards set by importing countries.

Firms dealing with exports claim that no problem exists in terms of quality in exports and they have certification according to HACCP, ISO 9000 and ISO 22000. Actually, no exported dried apricots have been refused. The quality factors monitored in dried apricots are the amounts of sulphide-oxide, humidity, pesticide residue, time of harvest, and packaging materials used. According to standards set by the Turkish Standards Institution (TSE), dried apricots are grouped according to how they are marketed, typed by preparation method, sorted based on appearance quality, and size class determined by the number of dried apricots per 1 kg. The groups are either natural or with added sulphide; types are with or without kernel and divided vertically (3 types), sorting is as Extra, Class I, II and Industrial and sizing is on a scale ranging from 1 to 8. In scale 1 there are up to 80 dried apricots in 1 kg and in scale 8 more than 200.

Dried apricots are generally exported in packs of 12 or 25 kg and re-packaged in the receiving country or used industrially. TSE standards mandate the upper limits of packages as 25 kg in the domestic market and 100 kg for industrial use. The amount exported in 2007 was 102 000 tons (see Table 16).

Table 16: Dried apricot exports of Turkey

Year	Amount (tons)	Value (million US $)
2000	73 000	112
2001	99 000	89
2002	70 000	122
2003	73 000	152
2004	80 000	199
2005	95 000	179
2006	111 000	194
2007	102 000	236

Source: South-Eastern Anatolia Exporters Association

No firms develop new products based on apricots, as dried apricots from Turkey have a good reputation on the world market. On the other hand, additional promotional activities would increase apricot consumption worldwide. Although exporting firms complain about the costs that would be incurred and the lack of capital to support such promotion, some of the larger firms participate in international fairs with government supports. The main destinations of exports are the USA (more than 60 %), the Russian Federation, the UK and France. The main quality problems are that workers do not take enough care during harvest, drying and storage, and that producers apply varied amounts of sulphide, and that storage facilities near farms are not suitable. Producers do not take responsibility but claim that they cannot invest in building a new storage room.

According to the Malatya Provincial Directorate of Agriculture, although organic farming increased in recent years producers do not exactly know (more than 80%) what constitutes organic farming. Those who have the certificate claim that they could not sell their product with a premium and suggest that quality is mainly due to climate, humidity and not having droughts. The Provincial Directorate of Agriculture maintains that they have started training programmes for GAP and will have results within 3 to 5 years. It has also formed teams for fertilizing and pesticide application according to the meteorological conditions. They are taking samples to the Diyarbakir Agricultural Research Institute and share the results with the farmers.

RRA (Çığlık village)

The RRA was conducted in the Çığlık village of the Doğanşehir district in Malatya province. There are 180 households and the main source of income is agriculture. The main agricultural activities are apricot production followed by apple, pear and cherry production, and field crops are wheat and beans (see table 17). In each household there are 2-3 cows for subsistence. Agricultural products are marketed through merchants, and marketing cooperatives are not present in the village. However, some farmers are members of the Malatya Apricot Producers' Association (not very active in the marketing of apricots) and also of the Agricultural Credit Cooperative.

Table 17: What are the production methods of the products in your village? Could you rank them?

Products (in order of significances)	Estimated area planted	Number of producers	Production method
Apricots	200 ha	132	Conventional
Apricots	30 ha	10	Organic
Apples	80 ha	65	Conventional
Wheat	110 ha	110	Conventional

The average annual income is around 5 000-6 000 TL/household, almost 90% from agriculture. Additional incomes are pensions and some people work for the government and private sectors in nearby Doğanşehir.

The apricot producers consider the attractiveness and product standards as food quality. Dried apricots and mulberry products (like mulberry molasses and dried mulberry pulp) are the special products of the region.

Villagers explain that their soil is different in terms of climate and composition and, therefore, apricots produced in the region are of a higher quality and more suitable for drying. Local apricots have more syrup and are bigger in size with no marketing problems. Thus, producers see no need to change their production methods. They do not have a brand name but their apricots are recognised all over Turkey as Malatya apricots. Other apricots cannot be confused with Malatya apricots as they are not suitable for drying.

There are farmers with organic production certificates in the village on an average land size of 5 to 6 ha and engineers from the Provincial Directorate of Agriculture educated them on the procedure. Organic farming is described by farmers as using very small, controlled amounts of pesticides and they have no knowledge of GAP or GIs. There is an interest in organic farming because of the price level. No products are marketed as PDO as although Malatya apricots officially hold this status producers are not aware of it.

In recent years new orchards have been established in Çığlık due to the increasing availability of water. The production method remained the same in recent years but some producers changed the varieties of apricot. There are no changes in processing or in organisation of farmers. The main marketing channel is traders of big firms. The net income has been decreasing due to increases in labour costs and chemicals whereas the price of apricots has been almost constant during the last 5 years.

The advantages are climate and soil composition, as well as very experienced producers, whereas the disadvantage is the insufficient capacity of warehouses for drying and storage. The main investment in the village is made in irrigation systems and pressurized water is heavily used by farmers. Some farmers also invest in new plantations. These are mainly covered by own capital because it is hard to fulfil bank credit requirements.

5.1.8. Antalya (Finike) – citrus

The Finike region of Antalya province is an important and renowned orange production area in Turkey. One third of the land suitable for cultivation (around 4 000 ha) is used for fruit cultivation (thereof 3 500 ha for citrus). In the Finike region the orange varieties are Washington, Valencia, Yafa and a native one used for orange juice. There are about 800 000 orange trees on 2 900 ha. The Washington variety is grown by around 5 000 farmers and obtained the certification PDO Finike orange in November 2008. The application was made in 2006 by the producers' association, which has almost 250 members. The total cost of the PDO process was around 20 000 TL. The registered amount of annual production of Finike oranges is around 105 000 tons and the total production amounts to 150 000 tons including unregistered production. Finike oranges are special due to their taste, the uniqueness of their aroma, their thin outer and inner skin and rapid ripening (which enables earlier harvest).

Farmers' major problems are insects like the Akdeniz fruit fly and mealy-bug during rapid ripening in fall. Farmers have also indicated that a lack of knowledge in using fertilizers and in taking care of the trees favours insects. A pesticide residue problem is almost non-existant. In addition, the gravelled terrain of the valley (in Turunçova where the main production is made) decreases the yield. The sprinkler irrigation system in one third of the area contributes to the different character of Finike oranges compared to the same cultivars grown elsewhere. The main marketing problem is that produce from other regions is marketed under the name Finike orange. The selling price of Finike oranges is above the average price in the domestic market due to early ripening and harvesting time.

RRA (Çavdır-Turunçova)

Çavdır in the Turunçova village has 500 households and 1 800 inhabitants. Citrus fruits and greenhouse production (mostly eggplants) are the main source of income. Almost 90% of citrus produced are oranges and the rest are lemons and tangerines. The products are marketed via merchants to the domestic 'high-price' market in Istanbul. The Fruit Producers' Organisation has 51 members in Çavdır. So far, this producer organisation has mainly worked to obtain the GI status. The average annual household income is around 10 000 TL based on agriculture. Very few villagers work as tradesmen or porters in logistics firms.

Hygiene, standards and organic production are mentioned by farmers when defining food quality. The special product is Finike oranges. The main difference in characteristics is due to the climate of the region. Producers are aware that they benefit from using Finike orange as a

brand name. However, merchants also use the name "Finike" for oranges produced in other regions to benefit from its reputation.

Production without the use of chemicals/pesticides is seen as organic farming by the producers, and GAP is regarded by farmers as controlled farming. They know about GIs and especially the PDO Finike oranges, mainly through the Fruit Producers' Organisation, and they also reported that there are no applications of GAP or organic farming in the region. The farmers do not believe that introducing organic farming or GAP will create any additional benefits but may only protect their current status by obtaining a certificate. The average size of the citrus orchards is 1 ha and around 200 households have additional greenhouse areas, with, on average, less than 0.1 ha. The fruit trees are mainly irrigated by 'flood irrigation' and the producers mentioned that an orange orchard of less than 0.5 ha is not economically feasible.

As a result of building greenhouses, fruit orchards are found to be decreasing in recent years. Sprinkler irrigation is increasingly used in production but there are no other attempts to increase the product quality. Producers are not well-organised but there are some emerging developments. The net profit earned from the production is decreasing mainly due to increasing input prices and decreasing sale prices.

The advantages are climate, soil and experience. The disadvantages are decreasing profitability and the presence of gravel roads in close proximity to orchards (causing dust and lice on fruits).

Farmers have mainly invested in sprinkler irrigation systems (10 000 TL/ha) in recent years and financed them mainly from their own capital, but also partly from subsidised bank credits.

5.1.9. Mersin – citrus

Mersin is one of the leading Turkish regions for citrus production.

RRA (Demirhisar Village)

Demirhisar village in Mersin province has 192 households and a population of 1 200. Citrus fruits and vegetables (eggplants and green peppers) are the main source of income. In addition, each household has 1 to 2 cows for subsistence. The village is famous for the 'Washington' orange variety, with the best produce found in Kızılalan region. In this region there are around 6 000 ha of orange orchards. The average yield is around 70 tons/ha ranging from 40 to 100 tons/ha.

Oranges are generally sold to local merchants and sometimes directly to exporters who come to the village. Oranges are mainly sold in bulk directly from the orchard. In addition, some oranges are sold in the Mersin Fruit and Vegetable Wholesale Market via agents. No cooperatives exist in Demirhisar but around 20 people are members of an Agricultural Credit Cooperative in a neighbouring village.

The average annual income is around 4 000 TL from citrus and vegetables. Farmers define product quality as free of pesticides. Oranges are the special product of the region. Oranges from this region are sold in the local market and in large cities, and compete with Finike oranges (PDO). Therefore to compete, producers would need to develop a brand name for Kızılalan oranges. There are no other products claiming similarity with Kızılalan oranges but

Kızılalan oranges are sold as Finike oranges in some markets. Organic farming is understood to mean pesticide-free production, and no application of organic farming exists among villagers. Producers have not heard about GAP and GIs. Due to the location of the village the production area is limited and interest in new production technologies is low.

In Demirhisar 192 households have orange trees on a total area of 170 ha. Sizes of orange orchards vary as 35 % have less than 0.5 ha, 40 % between 0.5-1 ha and 25 % more than 1 ha. In the village some farmers cultivate vegetables by renting around 50 ha.

Producers claimed that orange farm sizes have decreased during the last decade. Small farms have abandoned agriculture as people instead go to work in Mersin. Drip irrigation is increasing and there has been no change in processing or marketing. There is an interest in improving the quality of the products by lowering the pesticide use. Profits are falling due to low retail prices and high input prices.

The advantages are the geographical characteristics of the region (providing the favourable orange colour), expertise and the climate (humidity and wind), but land plots are small and fragmented causing disadvantages. Producers also stated that they receive bank credits to afford the investment in drip irrigation (around 4 000-5 000 TL per ha). They mentioned high fertilizer prices which result in obtaining small sized products due to undernourishment. The water price is another topic that farmers have been complaining about (around 1 000 TL/ha). If two instalments are not paid, the water supply is cut off and interest is charged on a daily basis.

5.1.10. Burdur – milk

Upon rapid development after the 1990s, Burdur became one of the leading milk production regions due to the donation of Holstein cows, for milk production, in a joint-venture project with Holland. This generated major interest around the region and among farmers. The soil is not very fertile, and therefore, many farmers shifted to milk production. The strength of cooperatives also contributed to the improvement of dairy cow breeding in this region. According to the data from the Burdur Provincial Directorate of Agriculture (BPDA), 99 % of the producers are cooperative members and 98 % use Holstein type cows for milk production. There are 19 000 members in 141 different cooperatives which form Köy-Koop, representing 106 000 cows producing around 750 to 800 tons of milk/day.

Owing to the developed nature of the cooperatives and the general agreement between members; improvements in terms of quality are easily adapted and there are milk collection centres in villages and small towns, which decrease the risk of microbial contamination after milking. In addition, there is a memorandum of agreement by BPDA to fine milk collecting in unhygienic conditions and also to support the presence of experienced personnel at the milk collection centres. In addition, the likelihood of having antibiotics in milk has been reduced as this is also tested during collection. In the case of positive samples, the responsible farmer could be identified and he incurs the cost of all the milk collected. Villages have started to build milking centres to increase the milk quality, and dairies pay premiums for milk from milking centres.

Köy-Koop is the primary responsible central cooperative in the marketing of all the milk obtained in Burdur. Nationwide firms such as Ak Gıda (60 %), Yörükoğlu, Cebeci, Pınar and Ekici are the main buyers. Around 10 plants located in Burdur, like Bur-süt, Çavuşoğlu etc.,

are also important buyers. The capacities of the dairy plants in Burdur are around 400 tons of milk/day. Each plant announces the amount they will buy daily and pays in advance, based on a 3-month deal with the Köy-Koop.

Bur-süt, with a capacity of around 50 tons/day, has obtained milk from 8 different cooperatives and processes a further 12 tons/day (November 2008). It has 25 workers in processing and produces yoghurt and cheese. The selling points are markets in the Burdur.

RRA (Büğdüz village)
Büğdüz village in the Burdur province has 600 households and a population of 1 800. The main sources of income are milk and cattle farming. Feed crops (clover) are also cultivated. Milk is marketed via the cooperative and fresh meat is sold to merchants. The producers in the village are either members of the Agricultural Development Cooperative of Köy-Koop (450 members) or of the Cattle Breeders Association (CBA). The cooperative is responsible for collecting raw milk and carries out the marketing for the farmers. It also provides veterinary services, feed and fertilizers. The average income of a household is around 5 000 TL, almost exclusively from agriculture.

Farmers define hygiene (especially the microbial count of milk) and the ratio of dry matter to fat content in milk as quality. They also claim that their milk has different characteristics owing to climate and their special feeding method. Their organisational strength (cooperatives) and the presence of milk collection centres in each village and their expertise are the main factors for increasing the quality of milk. Farmers know the basics about organic farming (production without fertilizers and pesticides), they have no information about GAP (they have not heard about it) and have no knowledge of GIs. They have no intention of producing with GAP or implementing organic production but they are aware of the fact that certifications could add value to their products.

The average number of cows is 7 to 8 per farmer, about 20 farmers have more than 10 and 180 farmers have less than 5 cows. The calves born each year are raised and generally sold within the first year. The land suitable for arable cultivation is very limited and is mainly used to grow feed for dairy cattle.

The average number of cattle owned by farmers decreased from 10 cows to 7 to 8 during the last decade, mainly due to the high prices for heifers. The strength of the cooperatives has enabled small farmers to survive. The creation of collection centres is one of the biggest achievements, leading to the building of milking centres in the villages. The increased usage of stainless steel material in the milking process has improved milk quality. The net profit earned from milk production is decreasing mainly due to decreasing real milk prices, and increasing of feed and veterinary service prices.

The advantages of milk production are the suitability of the land for animal breeding and the well-organised production structure (cooperatives). Farmers have not invested individually in technology. Almost all investments in milking machines are made via the cooperative and the costs incurred are deducted from the revenues from milk marketing.

5.1.11. Konya and Karaman – milk

Konya - Ereğli

According to the District Directorate of Agriculture there are 121 380 sheep, 5 600 goats, 30 710 cattle, and 10 790 calves in Konya - Ereğli (2008). In the region, 1 500 ha were used for the production of clover (180 000 tons) and 1 500 ha for maize in 2006. In the same year 136 000 tons wheat, 56 000 tons barley, 16 200 tons rye, and 10 800 tons maize were produced. The total agricultural area is 12 435 ha, of which 4 977 ha are irrigated. The total pasture area is 7 683 ha. In 2007, 21 milk plants bought around 178 000 tons of milk from 102 000 producers. However, only 54 000 tons of milk were eligible for intensive milk premiums as they met the principal hygienic conditions, accounting for 30% of total milk sold. The region has plants with a capacity above 50 000 tons per year; like Akbel (245 000 ton), Bahçe Cold Storage and Food (90 000 ton) and Meysüt (54 000 ton).

According to the agricultural engineer from the Konya Cattle Breeders' Association (CBA) it is estimated that 7 200 farmers are involved in animal breeding. Almost 4 753 farmers are registered with the CBA and 4 696 of them are individual farmers, 45 private firms, 4 public enterprises and 328 cooperatives, and the average number of cows owned by these members are 10.3, 78.7, 223.5 and 49.6 respectively.

In Halkapınar the total number of cattle is 29 155, of which 11 562 are dairy cows. In Konya the total number of cattle is 133 489, of which 54 187 are dairy cows. Around 21.3% of the total dairy cows are in Ereğli and Halkapınar. For the members of CBA, the average number of cattle is 28 and of dairy cattle is 10.3. The biggest farm is Akbel with 486 cows. The average milk production per farm household is 21-22 kg/day or 6 500 kg/year. CBA members are benefiting from the following services provided by CBA:

1) Artificial insemination
2) Pregnancy check
3) Genital inflammation control
4) ID record (0-6 month); a) birth date, b) sex, c) mother identity d) variety
5) Certificated seed supply for fodder production
6) Supply of feed additives (vitamins, minerals, premix)
7) Heifer supply (from members to members or agricultural development cooperatives or other associations)
8) Milking machinery units (for farmers with +50 cows or for small farmers; price in 2008 was almost 1 000 TL/unit)
9) Disinfectant material and equipment

CBA officials have claimed that the region is not suitable for GAP as the plants in the area are not disease-free.

Dairy plants collect raw milk from a) farmers directly b) producer associations and c) cooperatives. The large dairies, such as Ak Gıda, Sütaş and Akbel, prefer large farms for purchasing milk as they have collecting tanks. In addition, some milk is marketed to firms through 'milk agents'. The milk produced from small farms is left in small containers for a while and is later collected by small dairies that locally produce dairy products.

The major problems related to milk in the region, reported by CBA, are the misuse of antibiotics (lack of education and training), lack of milking utilities and unhygienic conditions, incorrect feeding (affecting the fat and acid content of milk) and mastitis. In the case of selling milk containing antibiotics; if exposed, the seller is omitted from the list and

fined. Beef cattle are sold on the regional market and slaughtered by companies like Maç, Aydost and Cihangir.

Meysüt

Meysüt started its production in 2002 and has operated since 2004 with a capacity of more than 100 tons/day. The firm produces only UHT milk and employs 65 workers and sells its product under different brand names like Bolkar, Talas, Enka and Akbel, mostly in east and south eastern parts of Turkey and in regional markets. The firm's products are sold in nationwide markets like Kipa-Tesco, Aytaç, Yimpaş and Saray under their brand name. The firm has ISO-EN-22000 and HACCP certifications. It has 4 'milk agents' collecting milk from the farms with cooling tanks.

Meysüt analyzes raw milk for acidity (pH), brix, alcohol, hydrogen-peroxide, fat content, antibiotics, and performs sensory analysis. All the information concerning the tanker, amount, arrival hour and collected centres are recorded. The firm's workers also check the area where milk is collected before it is transferred to the plant. Also five experts give training to the milk producers in terms of hygiene (safety), and the quality has improved since 2007 (considering the results of alcohol tests).

The plant manager has a doctorate in milk processing and is very experienced. He indicated that they also carry out pesticide and aflatoxin tests.

Konya Ereğli Milk Producers Association

It was founded in 2006 with 19 members and as of November 2008 had 75 members (milk producers), and it has become a major milk collector in the region. The daily milk collection quantity is around 70 tons and it is sold to major nationwide collectors such as Ak Gıda (35 tons), Sütaş (10 tons) and Meysüt (20-22 tons). The market share of the association in Ereğli was around 30% in 2008.

The primary condition to become a member is to supply at least 200 litres milk/day, which requires at least 15 cows. The average number of cows is above 40 and there are 9 cooperatives among the members. There are also two enterprise members with more than 650 cows each.

Members benefit from training on general hygiene, animal feeding etc. free of charge and also receive animal feed at a discounted rate. Additionally, they obtain certified disinfectants. The association collects milk from its members and test samples in its own laboratories for general quality and hygiene standards. Only cooled raw milk is purchased, in order to secure a complete cold chain from milking to the dairies. Members disregarding the general hygiene standards (milk without antibiotics etc.) and Food Codex are expelled from the association. The microbial count of raw milk is within the legal limits and decreasing, members have to pay an entrance fee below the minimum wage. The association also tests for alcohol (not a legal mandate) to check whether the milk is pure and to extend the shelf life of UHT milk. The number of members is increasing, mainly due to the incentives added to milk prices by the association in 2007.

Konya-Çumra

Okçu, in the village Çumra, has 600 households with a population of 2 200. The main sources of income are wheat, barley, sugar beet, beans, maize, fodder crops and dairy cattle. Local traders sell these products in the market. Milk is collected by the producers' organisation or

milk collectors and the producers' organisation also serves to increase the general hygiene and milk quality.

In Çumra there are 80 000 sheep and 33 000 cattle, including 12 000 dairy cows. The annual milk yield is 5 tons per cow. The agricultural area is around 100 000 ha, about 70% of which is irrigated. Around 60 to 65% of the land is planted with wheat and barley, followed by sugar beet, cereals and maize (6 500 ha).

Milk produced in Çumra is collected by contractors from Konya. Collected raw milk is left outdoors in plastic containers and collectors use cooling tanks and transfer them to the dairies. There is a 2% tax on the producer. The Milk Producer Organisation has 72 members, CBA Çumra Branch has 500 members and there are 3 Agricultural Development Cooperatives.

Çumra Milk Producer Organisation

The total number of cattle of its 72 members is 1 765, around 25 per member. The association serves its members in terms of cleaning and hygiene, cooling tanks and milking machinery. A total of 15 cooling tanks exist with a capacity of around 1 or 2 tons each. Each day around 12 200 litres of milk are collected and sold to Ak Gıda (7 500 litre), Sek Süt (3 000 litre) and Ova Süt (1 700 litre). The milk marketed by the association is tested in terms of the Food Codex and minimum quality and hygiene requirements. If the milk contains antibiotics or water, there is a high penalty and membership can be cancelled. Veterinarians and food engineers train members on milk quality and hygiene. The annual fee was around 125 TL in 2008. In this district, there is a sugar plant and sugar beet is also cultivated and given to the cows as feed, but if the cow is overfed the milk fat content decreases, water content increases along with the risk of sickness. Therefore, members' cows should not be fed with sugar beet. Members produce around 85% of their feed on their own farms.

RRA (Üçharman in Karaman-Ayrancı)

There are 460 people living in 130 households where the main income is from wheat, barley and sheep farming. Cheese is made from sheep's milk and lamb is sold as fresh meat to Ereğli. 20% of the produced wheat is sold to merchants and the Turkish Grain Board (TMO), the rest is used for self-consumption. Cheese made from sheep's milk is placed in a lamb skin and stored in June in a 36-metre deep underground cave (obruk) and stored there until October-November (5 to 6 months). This cheese is known as Divle Obruk cheese and is sold at 17-18 TL/kg whereas lamb's milk is sold at 1 TL/kg so the added value is very high. The village has an Agricultural Development Cooperative with 72 members, which was founded by cattle breeders from a neighbouring town, Kıraman. The cooperative is supported by a Rural Social Support Project where each member with at least two cows is supported and members sell their milk to Arpacı Milk Plant in the near Ereğli district. The average annual income is 4 000 TL and everybody is involved in agriculture. In the village, 750 ha are planted to wheat and barley (by 120 producers) and there are 5 000 lambs (owned by 70 farmers) and 200 cattle (owned by 30 farmers). During the last decade there have been severe droughts, thus decreasing the fertility of the land and productivity. Producers graze the sheep on pastures and feed the cows with feed produced on their own land.

Producers understand hygienic conditions as representing food quality, and the special product of the region is Divle Obruk cheese. During the time in the underground cave a red mould covers the lamb skin giving the cheese a unique flavour. A firm in Karaman province (Fidan Milk Plant) has registered a cheese brand under the same name, but the chief of the village has sued the firm. There are many fake products marketed in the region under the

same name that are produced from a sheep/cow's milk mixture and kept in cold rooms. The village, together with the head officials of the district, has applied to the Turkish Patent Institution (TPE) for GI certificates but they have been denied due to the lack of a proposed procedure to assess the cheese quality. In the 2007-2008 season around 60 tons of cheese were stored underground with a value of around 1 000 000 TL. The cave is under the control of the villagers and the management takes 0.5 TL/kg fee.

Producers are not aware of organic farming, GAP or GI. During the last decade the number of sheep has decreased from 32 000 in the early 1970s to around 8 000 in 2000 and to 5 000 in 2009. Small producers ceased production and many also left the village. Therefore the remaining population is generally elderly. During the last decade no technological development has been made in terms of cheese production. The producers' organisation is poor and the sheep breeding has additionally slowed during the droughts. There is a decrease in net profit because of higher input costs and lower retail prices of milk, meat and livestock.

The main advantage of the region is the specific production method of Divle Obruk cheese from sheep's milk. The disadvantages are the lack of water, droughts and ageing population. The new members of the Agricultural Development Cooperative in the village are investing in milking machinery, building a new barn and wells.

5.2. Summary results of RRA studies

In Table 18 socio-economic and demographic structures of the selected village are presented, and producers' answers regarding quality issues are assessed in five different levels ranking from 'too weak', 'weak', 'fair', 'good' to 'excellent', and taken as 1 to 5, respectively. During the evaluation of answers, no answers and wrong/false answers were categorised as 'too weak'; partially correct answers as 'weak'; correct answers combined with no applications as 'fair'; some applications as 'good'; and both correct answers and applications as 'excellent'.

Table 18: Summary results of RRA studies with farmers in villages

Evaluation criterions \ Province (sub-province)		Afyon.	Balikesir (Ayvalik)	Antalya (Kumluca)	Isparta (Egirdir)	Manisa (Alasehir)	Aydin	Malatya	Antalya (Finike)	Mersin	Afyon.	Burdur	Konya and Karaman
Name of the village / township		**Susuz township**	**Akca-pinar village**	**Saricasu village**	**Eyupler village**	**Baglica village**	**Cariklar village**	**Ciglik village**	**Turuncova township**	**Demir-hisar village**	**Kucuk-cobanli village**	**Bugduz village**	**Ucharman village**
Product		**Beef**	**Olive oil**	**Tomatoes**	**Apple**	**Grapes - raisins**	**Dried figs**	**Dried apricots**	**Citrus**	**Citrus**	**Milk**	**Milk**	**Milk**
Socio-economic and demographical structure	Population No. of households	*6 000* *1 000*	*1 200* *500*	*3 500* *1 000*	*310* *85*	*1 600* *550*	*482* *165*	*-* *180*	*1 800* *500*	*1,200* *192*	*750* *85*	*1 800* *600*	*460* *130*
	Household income (ave.)	*7 000 TL*	*6 000 TL*	*10 000 TL*	*12 000 TL*	*7 000 TL*	*4 000 TL*	*5-6 000 TL*	*10 000 TL*	*4 000 TL*	*8-10 000 TL*	*5 000 TL*	*4 000 TL*
	Average farm size	*10 cows*	*1 ha*	*0.4 ha*	*1.5 ha*	*3 ha*	*1.6 ha*	*1.5 ha*	*1 ha*	*0.9 ha*	*20 cows*	*8 cows*	*70 ewes* *6 cows*
	Level of cooperation *	*Fair* *PO*	*Good* *ADC*	*Too weak*	*Good* *ADC*	*Weak* *ACC*	*Good* *ADC*	*Weak* *ACC*	*Weak* *PO*	*Weak* *ACC*	*Fair* *PO*	*Excellent* *ADC*	*Fair* *ADC*
	Marketing	*Industry*	*Coop. and industry*	*Wholesale*	*Coop. and merchant*	*Merchant, industry*	*Coop. and merchant*	*Merchant*	*Wholesale*	*Wholesale*	*Merchant*	*Coop.*	*Industry*
Knowledge	Quality	*Fair*	*Good*	*Weak*	*Good*	*Fair*	*Good*	*Fair*	*Fair*	*Weak*	*Fair*	*Good*	*Fair*
	Organic agriculture	*Fair*	*Too weak*	*Fair*	*Fair*	*Weak*	*Fair*	*Good*	*Fair*	*Too weak*	*Fair*	*Fair*	*Too weak*
	Good Agricultural Practices (GAP)	*Too weak*	*Too weak*	*Weak*	*Good*	*Weak*	*Too weak*	*Too weak*	*Fair*	*Too weak*	*Too weak*	*Too weak*	*Too weak*
	Geographical Indications (GI)	*Weak*	*Weak*	*Weak*	*Too weak*	*Too weak*	*Weak*	*Too weak*	*Excellent*	*Too weak*	*Fair*	*Too weak*	*Too weak*
Interest in	Quality systems	*Fair*	*Fair*	*Fair*	*Good*	*Fair*	*Good*	*Good*	*Good*	*Weak*	*Fair*	*Good*	*Too weak*
	GAP and/or organic agriculture	*Too weak*	*Too weak*	*Weak*	*Good*	*Weak*	*Fair*	*Good*	*Too weak*	*Too weak*	*Too weak*	*Too weak*	*Too weak*
	Product protection (GIs)	*Weak*	*weak*	*Weak*	*Fair*	*Weak*	*Fair*	*Fair*	*Good*	*Too weak*	*Fair*	*Fair*	*Too weak*

Evaluation criterions \ Province (sub-province)		Afyon.	Balikesir (Ayvalik)	Antalya (Kumluca)	Isparta (Egirdir)	Manisa (Alasehir)	Aydin	Malatya	Antalya (Finike)	Mersin	Afyon.	Burdur	Konya and Karaman
Name of the village / township		**Susuz township**	**Akca-pinar village**	**Saricasu village**	**Eyupler village**	**Baglica village**	**Cariklar village**	**Ciglik village**	**Turuncova township**	**Demir-hisar village**	**Kucuk-cobanli village**	**Bugduz village**	**Ucharman village**
Product		**Beef**	**Olive oil**	**Tomatoes**	**Apple**	**Grapes - raisins**	**Dried figs**	**Dried apricots**	**Citrus**	**Citrus**	**Milk**	**Milk**	**Milk**
Expectations	Profit and contribution from GAP and/or organic agriculture	*Too weak*	*Weak*	*Fair*	*Fair*	*Fair*	*Fair*	*Good*	*Weak*	*Too weak*	*Too weak*	*Fair*	*Too weak*
	Profit and contribution from product protection (GIs)	*Weak*	*Weak*	*Fair*	*Fair*	*Fair*	*Good*	*Fair*	*Good*	*Too weak*	*Weak*	*Fair*	*Too weak*
Changes in last decades	Sizes	*Increase*	*Increase*	*Increase*	*Same*	*Decrease*	*Same*	*Same*	*Decrease*	*Decrease*	*Increase*	*Decrease*	*Decrease*
	Investments (level and aim)**	*Increase T.E.*	*Increase P.M.*	*Increase P.M.*	*Increase T.E.+P.M.*	*Increase T.E.*	*Increase P.M.*	*Same*	*Increase T.E.*	*Increase T.E.*	*Increase -*	*Increase T.E.+P.M.*	*Same*
	Cooperation	*Increase*	*Same*	*Decrease*	*Increase*	*Decrease*	*Increase*	*Decrease*	*Increase*	*Same*	*Increase*	*Same*	*Increase*
	Profit	*Decrease*	*Decrease*	*Decrease*	*Decrease*	*Decrease*	*Decrease*	*Decrease*	*Decrease*	*Decrease*	*Decrease*	*Decrease*	*Decrease*
Investments for improvement of quality	Products	*Weak*	*Weak*	*Weak*	*Good*	*Weak*	*Good*	*Fair*	*Good*	*Weak*	*Weak*	*Fair*	*Weak*
	Production techniques	*Good*	*Fair*	*Good*	*Good*	*Good*	*Good*	*Weak*	*Good*	*Weak*	*Fair*	*Good*	*Fair*

*** Level of cooperation: PU includes producer unions – ACC includes credit cooperatives – ADC includes development cooperatives**

**** Investment: T.E. used for technical equipments, P.M. used for production methods**

Table 19: Results of interviews with key local actors

Products	Province (sub-province)	Quality perspective			Agricultural sector structure		Vertical and horizontal relations			Observations/ key issues and benefits
		Authenticity	Process	Safety	Average farm size	Geographic coverage	Food distribution	Food industry	Agricultural sectors	
Beef	**Afyon.**	PGI (Sucuk and Pastrami)	-	-	20.3 cattle	Southern part of Afyon	Own-shops and traders are important	A few leading regional firms	Producers' organisations	Protect traditional production methods
Olive oil	**Balikesir (Ayvalik)**	PDO	-	-	3.3 ha	Ayvalik district below Edremit bay	Own-boutique shops and wholesalers	A few national and many regional firms	Cooperatives	Labour cost is too high and many small shops exist
Tomatoes	**Antalya (Kumluca)**	-	GAP	Residues and sanitation	0.5 ha	Kumluca district	Wholesale market agents, exporters, local traders	Many packaging houses	Fragmented	Food safety prior
Apples	**Isparta (Egirdir)**	-	-	Residues and sanitation	1-1.5 ha	Between Egirdir and Kovada lakes	Cooperatives, wholesale market agents and local traders	International fruit juice firms	Producers' organisations	Convenient for GAP applications
Grapes - raisins	**Manisa (Alasehir)**	-	-	Residues and sanitation	3.9 ha	Alasehir district	Cooperatives, exporters and local traders	A few manufacturing plants and packaging houses	Cooperatives	Food safety prior.
Dried figs	**Aydin**	PDO	-	-	1 ha	Western part of Aydin	Cooperatives, exporters and local traders	A few manufacturing plants	Cooperatives	Higher prices for farmers
Dried apricots	**Malatya**	PDO	-	Sulphite content	1.44 ha	Malatya province	Exporters, wholesalers and local traders	A few manufacturing plants and packaging houses	-	Sold in bulk so impossible to use GI
Citrus	**Antalya (Finike)**	PDO	-	Sanitation	0.6 ha	Finike district	Exporters, wholesale market agents and local traders	Many packaging houses	Producers' organisations	Higher prices for farmers
Citrus	**Mersin**	-	-	Sanitation	-	Kızılalan region	Exporters, wholesale market agents and local traders	Many packaging houses	-	Advantages for marketing
Milk	**Afyon.**	-	-	Sanitation (microbial count)	16.6 cows	Southern part of Afyon.	Local traders	Some national and small scale regional dairy plants	Producers' organisations	Add extra value to milk
Milk	**Burdur**	-	-	Sanitation (microbial count)	5.6 cows	Burdur Province	Cooperatives	Some national and a few small scale regional dairy plants	Cooperatives	Premium milk prices for farmers; rural development of the region
Milk	**Konya and Karaman**	PGI for Obruk cheese was not accepted	-	Sanitation (microbial count)	10.3 cows	Konya-Cumra district and Karaman-Divle	Producers' organisations and local traders	A few regional and local small scale dairy plants	Producers' organisations	Value added product

Producers could not accumulate capital as the average annual household income earned from their products during the last few years has been low (Figure 6). This is a handicap for expansion and investment in quality. Therefore, producers could be clustered into producer organisations to collaborate in quality production. Moreover, it is necessary to support GI certification of products complying with the required quality. Legal regulations to allow price determination according to quality criteria or policies including quality premium may also provide incentives for investment in quality improvement measures.

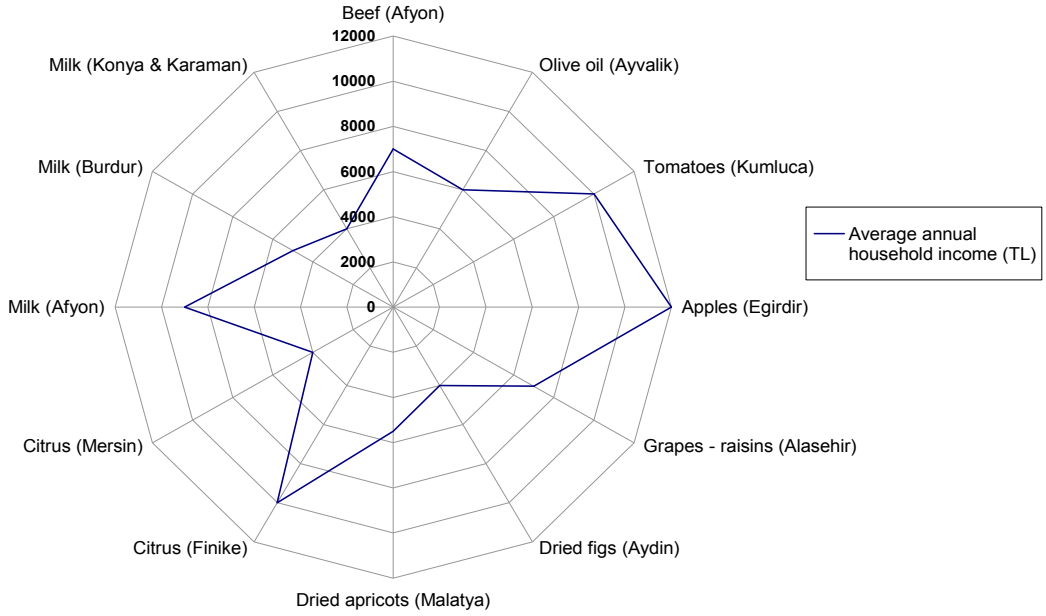

Figure 6: **Radar chart for socio-economic structure of producers**[10]

Figure 7 provides an overview on the current knowledge of producers regarding different food quality concepts.

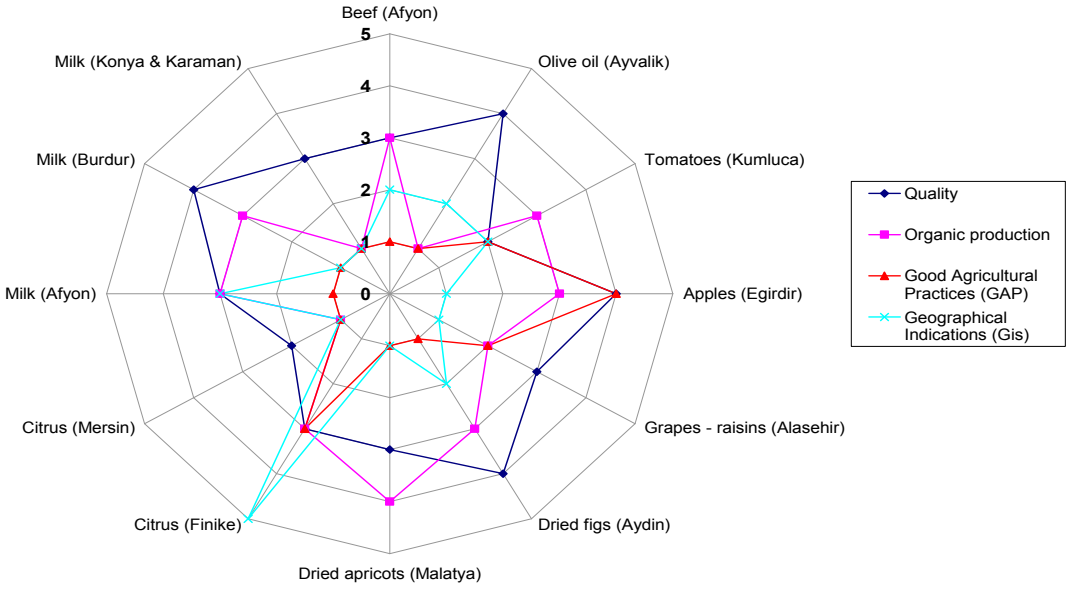

Figure 7: Radar chart for producers' awareness about quality and quality systems

[10] The exchange rate for Turkish Lira (TL) in June, 2009 is 1 € = 2.15 TL

There is also a misunderstanding regarding the concept of GIs (Figure 8). For example, some products have a PGI certificate even if they are not eligible for PGI status but should be classified with TSG certificates. This would certify the traditional production method and not be linked to the origin of the product or the location of the elaboration process. This option is not included in the current Turkish legislation concerning GIs but is embedded in the draft law. In addition, it is possible to obtain certification with other quality marks (like "Woolmark") but there is no application as those quality marks are often unknown.

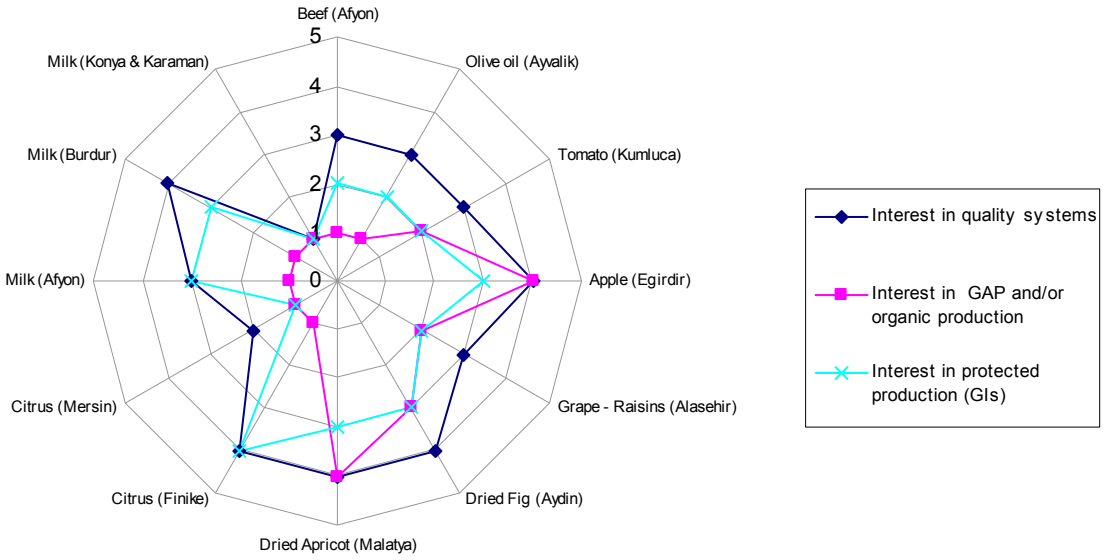

Figure 8: Radar chart of producers' interest

The interest of producers in quality production is rapidly developing; however their interest in organic farming and GAP is low. Most producers have heard about and are interested in GIs whereas their expectations of benefits derived from GIs or organic farming and/or GAP were not high enough to warrant their investment in them (Figure 9).

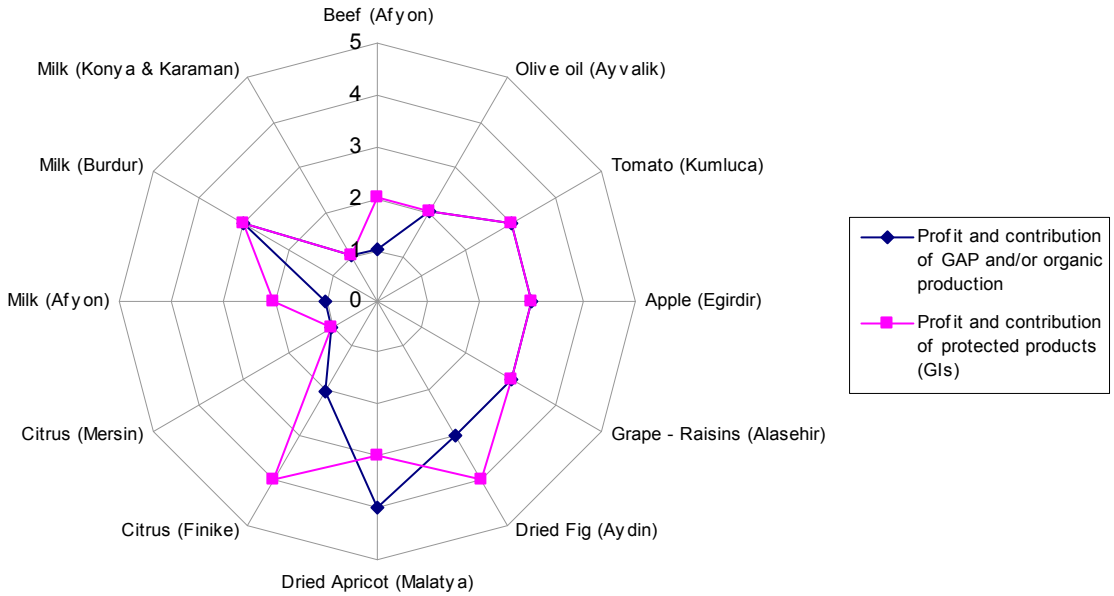

Figure 9: Radar chart of producers' expectations

The products are evaluated in relation to the criteria elaborated by Hayes *et al.* (2003) for successful differentiation of agricultural products in Table 20. Products which have at least one excellent evaluation are considered to be potentially successful in obtaining GI certificates, converting to organic production and/or implementing GAP. The information presented relates to the structural observation in the RRA (marketing power, infrastructure investments, governmental supports and special sub-products).

Table 20: Evaluation of products (according to differentiation criteria)

Product	**Region**	The product could transmit price signals from consumers to producers	The production scale could be sufficiently large to justify the costs of creating and maintaining a differentiated image among consumers	Imitations of the product could be prevented	Methods of supply control could not violate price fixing laws
Beef and meat products	**Afyon.**	good	good	good	excellent
Olive oil	**Balikesir (Ayvalik)**	good	good	good	excellent
Tomatoes	**Antalya (Kumluca)**	excellent	moderate	weak	good
Apples	**Isparta (Egirdir)**	good	moderate	weak	excellent
Grapes - raisins	**Manisa (Alasehir)**	moderate	good	weak	moderate
Dried figs	**Aydin**	good	moderate	good	excellent
Dried apricots	**Malatya**	good	moderate	moderate	excellent
Citrus	**Antalya (Finike)**	excellent	good	weak	good
Citrus	**Mersin**	moderate	moderate	weak	good
Milk and dairy products	**Afyon.**	good	excellent	moderate	good
Milk and dairy products	**Burdur**	good	good	moderate	moderate
Milk and dairy products	**Konya and Karaman**	good	good	good	moderate

In addition, there are some important observations regarding the regions. In Afyon, the only purpose of achieving a PGI for sucuk production is for the protection of the traditional production methods, not for marketing reasons. The labour costs in olive oil production are high and many small shops exist in Ayvalik (Balikesir). Food safety is a priority for tomato production in Kumluca, Antalya, and grape and raisin production in Alasehir (Manisa) strive to comply with export market requirements and requested export formalities. Apple production in Egirdir (Isparta) is convenient for GAP applications because there is a limited but well-equipped production area (such as drip irrigation systems, pesticide preparation areas, warehouses, packaging units etc.). Fig producers in Aydin could charge higher prices for their product because it is a unique place for producing high quality dried figs. Dried apricots are sold in bulk so it is impossible to use GIs in Malatya. Orange producers in Antalya also get higher prices for their product because Finike oranges have a unique taste and the harvesting period is

almost one month earlier than other varieties. There are marketing advantages for orange producers in Mersin because its location is so close to the citrus exporters and fresh-cut fruit and fruit juice producers. Buffalo milk producers in Afyon could add extra value to milk by producing traditional milk products (cream). Milk producers in Burdur get premium milk prices because the producers are very well clustered within cooperatives in this region. Milk producers in Konya and Karaman could add value by producing cheese.

As a result, by combining the evaluation with the assessment of the regions, it is found that some products could potentially be successful candidates for GIs:

- Ayvalik olive oil;
- Finike oranges;
- Afyonkarahisar cream; and
- Afyonkarahisar sucuk (whether this product could achieve a premium price versus private brands needs to be analysed).

Some products were determined as having potential for organic production:

- Dried apricots;
- Dried figs;
- Milk (only for medium and large scale farms); and
- Beef (only for medium and large scale farms).

Some products were determined as favourable for GAP application:

- Citrus produce;
- Apples;
- Tomatoes;
- Milk (the disease-free status of the region should be announced by TKB); and
- Meat (the disease-free status of the region should be announced by TKB).

In addition, Divle Obruk cheese in Konya and Karaman could be certificated with a TSG.

6. Conclusions and recommendations

Conclusions

- Lack of quality awareness of consumers and producers is determined as one of the main problems from the SWOT and LFM studies. Producers' knowledge is limited and their quality perception focuses mainly on food safety. Furthermore disorganised small scale producers are unable to solve quality issues by themselves.
- The coordination and collaboration among actors in the food chain are very weak in terms of developing and ensuring a quality assurance scheme, resulting in problems in supplying reliable quality products to markets. Different organisations and institutions are also responsible for different aspects of quality production and assurance. Moreover, there are many institutional conflicts, not only with regards to the relationship between organisations and/or institutions but also within organisations and their own implementations.
- Incentives for food quality through complementary procedures do not exist. Thus, SMEs and agricultural holdings are not supported financially to improve quality assurance, therefore limiting investments in quality production. In conclusion, it is difficult for small producers and enterprises to accumulate capital to improve product quality, which might lead to exclusion from dynamic food markets.
- There are barriers in exports due to quality that reduce the Turkish share in world food markets. However, the infrastructure regarding food safety issues, such as minimum legal requirements, requested by importing country authorities and/or multinational food retail chains has generally been improved.
- Key stakeholders are not sufficiently organised to obtain GI certification for the important food products in their region. This leads to overlaps among certified products and failure in product protection. Moreover, producers were uninformed about GIs and have little interest in GIs due to their small scale.
- There was only one producer organisation (producer union) established by the region's producers with a GI certificate. The other certifications were obtained by cooperatives, chambers of commerce and industry, municipalities and provincial governance.
- Only tomato producers achieved GAP applications among selected products.
- Lack of trust in quality certification audits and auditing competences leads to moral hazards.
- Observations showed that there were great quality improvements in milk production; the milk quality now exceeds the minimum Food Codex requirements. The main driver for this improvement is the existence of large scale national and international dairy companies pushing forward quality standards in the market. However, small producers could be excluded from this dynamic market because of their traditional production techniques and infrastructure which does not fulfil buyers' requirements.
- Through the RRA studies on participation of small-scale producers in organic farming it was also observed that they voiced low interest.
- Academic studies and research projects (funded by TUBITAK – The Scientific and Technological Research Council of Turkey) are limited in number and also require an improvement in quality.

Recommendations

- Quality awareness of consumers and producers must be improved by training and by using communication means to effectively overcome food quality assurance schemes problems in Turkey. To serve this purpose, institutions like TKB, DPT, TPE, TSE, TZOB etc. should cooperate.
- There should be cooperation between TKB and MEB (the Ministry of National Education) in raising awareness of students in compulsory education.

- Public awareness raising campaigns should be organised, supported by sector associations (NGOs), TKB and other public institutes. Meetings with mass media representatives and journalists should be organised on the topic of food quality; public TV channels (TRT) and other national and also local coverage channels should keep the topic 'hot' on their agenda.
- There is a need for a complementary perspective and coordination among responsible institutions on food quality.
- Infrastructure investments for improving food quality assurance systems should be sustained by TKB and other related institutes parallel to the development and quality and safety demands of the domestic and international markets.
- Quality infrastructure development projects should be sustained by using EU and/or World Bank (WB) grants.
- TKB should design support schemes for further improving food quality which must cover GIs and trademark certified products.
- The Under-Secretary of Foreign Trade (DTM) should support exports of safety and quality guaranteed products and should also conduct market research on products with organic labels and a high level of quality standards.
- KOSGEB (The Supporter Association of SMEs in Turkey) and TKB should associate rural development supports with traceability applications.
- The EU accession period should not be interrupted and the adoption period of the legislation should be completed accordingly.
- Future research may focus on supply chain analysis and obstacles in collaboration between key actors, consumer response to quality in domestic markets, and on a model to prevent small scale producers being excluded from dynamic markets.

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Annex A: Screening of food safety, quality and traceability issues and the identification of harmonisation of Turkish food legislations with EU legislations

1) Regulation (EC) No 178/2002 European Parliament and the Council, 28.01.2002 General principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety	**1)** Veterinarian Services, Crop Health, Food and Feed Law No. 5996 Official Gazette published: 13.06.2010/ 27610 (includes laws no: 5179 (2), 1734(3) and 3285 (4)) **2)** Law on Adoption of The Amended Decree By-Law on The Production, Consumption and Inspection of Food Law No: 5179 Official Gazette published : 5.06.2004/ 25483 **3)** Feed Law: 1734 **4)** Animal Health and Recording Law : 3285
2) Regulation (EC) No 882/2004 European Parliament and the Council, 29.04.2004 Official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules.	**5)** Regulation on Production, Consumption and Inspection of Foods, Official Gazette published: 9.06.1998/ 23367. **6)** Regulation on Market Surveillance and Control of Food and Food Contact Materials and Responsibility of Food Business Operators; Official Gazette published: 30.03.2005/ 25771 – This regulation was repealed by the publication of the next regulation. **7)** Regulation on Inspection and Control of Food Safety and Quality, Official Gazette published: 9.12.2007/ 26725 - Draft; Regulation on the Procedures and Principles for Importation and Exportation Control of Food Materials and Food Contact Materials and Articles
3) Regulation (EC) No 852/2004, European Council, 29.04.2004 Regulation on the hygiene of foodstuffs. **4)** Regulation (EC) No 853/2004 of the European Parliament, 29.04.2004 Specific hygiene rules for food of animal origin. **5)** Regulation (EC) No 854/2004 of the European Parliament, 29.04.2004 Specific rules for the organisation of official controls on products of animal origin intended for human consumption. **6)** Directive 2004/41/EC, 21.04.2004, Food hygiene and health conditions for the production and placing on the market of certain products of animal origin intended for human consumption.	**8)** Regulation on Work Permit, Food Registry and Production Permit Operations and Employment of Responsible Managers in Businesses that Produce Food and Articles and Materials that Come into Contact with Food, Authorization Law No. 5179, Official Gazette published: 27.08.2004/ 25566. - Regulation on Inspection and Control of Food Safety and Quality, Official Gazette published: 9.12.2007/ 26725
7) Commission Directive 2002/63/EC of 11.07.2002 establishing Community methods of sampling for the official control of pesticide residues in and on products of plant and animal origin.	**9)** Communiqué on Maximum Residue Limits of Veterinary Medicine on Animal Oriented Foods Official Gazette published: 28.04.2002/ 24739.
-	**10)** Regulation on Good Agricultural Practices Official Gazette published: 8.09.2004/ 25577.
-	**11)** Regulation on Controlled Greenhouse Production Official Gazette published: 27.12.2003/ 25329.
8) Regulation (EC) No 2073/2005, Commission 15.11.2005, Regulation on microbiological criteria for foodstuffs	**12)** Communiqué on Microbiological Criteria Authorization Law: Turkish Food Codex The Official Gazette: 2.09.2001/ 24511
9) Regulation (EC) No 2200/1996 The Council, 28.10.1996 Regulation on the common organisation of the market in fruit and vegetables **10)** Regulation (EC) No 1148/2001, Commission 12.06.2001. Regulation on checks on conformity to the marketing standards applicable to fresh fruit and vegetables	**13)** The Law Relating to The Preparation and Implementation of The Technical Legislation on The Products, Law no: 4703, 11/07/2001-24459 (Under-Secretary for Foreign Trade (DTM)) **14)** Decree Having the Force of Law on Establishment and Duties of the Ministry of Agriculture and Rural Affair (TKB) The Official Gazette: 9.08.1991/ 20955
11) Directive 2000/29/EC, Council 8.05.2000. Directive on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community	**15)** Law on Plant Protection and Agricultural Quarantine Law No: 6968 The Official Gazette: 24.05.1957/ 9615. - Draft Law was prepared but has not approved, yet.

12) Regulation (EC) No 3223/1994, Commission 21.12.1994 Regulation on detailed rules for application of the import arrangement for fruit and vegetables	- Regulation on Production, Consumption And Inspection of Foods, Official Gazette published: 9.06.1998/ 23367. (6th Chapter; Imports, Exports and Customs Centre).
13) Directive 1999/2/EC European Parliament and the Council,22.02.1999 Directive on the approximation of the laws of the Member States concerning foods and food ingredients treated with ionising radiation. **14)** Directive 1999/3/EC European Parliament and the Council, 22.02.1999. Directive on the establishment of a Community list of foods and food ingredients treated with ionising radiation	**16)** Turkish Food Codex - Food Irradiation Regulation, Official Gazette published: 6.11.1999/ 23868
15) Regulation (EC) No 258/1997 European Parliament and The Council, 27.01.1997 Regulation concerning novel foods and novel food ingredients.	- Draft; Turkish Food Codex – Communiqué on novel foods and novel foods ingredients
16) Directive 89/107/EC The Council, 21.12.1988 Directive on the approximation of the laws of the Member States concerning food additives authorized for use in foodstuffs intended for human consumption. **17)** Directive 95/2/EC, European Parliament and Council, 20.02.1995 Directive on food additives other than colours and sweeteners	**17)** Turkish Food Codex - Communiqué on Food Additives Other Than Colours and Sweeteners, Official Gazette published: 22.12.2003/ 25324.
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19) Directive 94/36/EC, European Parliament and the Council, 30.06.1994, Directive on colourings for use in foodstuffs.	**19)** Turkish Food Codex - Communiqué on Colours Used in Foodstuffs, Official Gazette published: 25.08.2002/ 24857.
20) Directive 88/388/EC The Council, 22.06.1988. Directive on the approximation of the laws of the Member States relating to flavourings for use in foodstuffs and to source materials for their production. **21)** Regulation (EC) No 2232/1996, European Parliament and Council, 28.10.1996. Regulation Laid down a Community procedure for flavouring substances used or intended for use in or on foodstuffs.	- Draft; Turkish Food Codex - Communiqué on Flavourings Used in Foodstuffs
22) Directive 2000/13/EC Commission, 20.03.2000 Directive on the approximation of the laws of the Member States relating to the labelling, presentation and advertising of foodstuffs	**20)** Turkish Food Codex – Communiqué on Rules for General Labelling and Nutritional Labelling of Foodstuffs (2002/58) Official Gazette published: 25.08.2002/ 24857
23) Regulation (EC) No 19355/2004, European Parliament and the Council, 27.10.2005. Regulation on materials and articles intended to come into contact with food.	**21)** Turkish Food Codex - Communiqué on Materials and Articles in Contact with Foodstuffs, 22.04.2002/ 24734
24) Regulation (EC) No 1895/2005. Commission, 18.11.2005. Regulation on the restriction of use of certain epoxy derivatives in materials and articles intended to come into contact with food.	**22)** Turkish Food Codex - Communiqué on Epoxy Derivates Materials and Articles that are in Contact with the Foodstuffs 04.07.2005-25865
25) Regulation (EC) No 2023/2006. Commission, 22.12.2006. Regulation on good manufacturing practice for materials and articles intended to come into contact with food.	- Turkish Food Codex - Communiqué on Materials and Articles in Contact with Foodstuffs, 22.04.2002/ 24734 (Article 4)
26) Directive 2002/72/EC Commission, 6.08.2002. Directive Relating to plastic materials and articles intended to come into contact with foodstuffs.	**23)** Turkish Food Codex - Communiqué on Plastic Materials and Articles that are in Contact with the Foodstuffs, 04.07.2005/ 25865
27) Directive 1984/500/EC Council, 15.10.2004 Directive on the approximation of the laws of the Member States relating to ceramic articles intended to come into contact with foodstuffs.	**24)** Turkish Food Codex - Communiqué on Ceramic Articles which come into Contact with Foodstuffs, 04.09.2001/ 24603
28) Directive EU 93/10/EC Commission, 13.03.1993 Directive relating to materials and articles made of regenerated cellulose film intended to come into contact with foodstuffs.	**25)** Turkish Food Codex - Communiqué on Articles, made by regenerated cellulose films, which come into Contact with Foodstuffs Official Gazette published: 4.12.2001/ 24603

29) Regulation (EC) No 510/2006, Council, 20.03.2006. Regulation on the protection of geographical indications and designations of origin for agricultural products and foodstuffs.	**26)** Decree-Law on the Protection of Geographical Signs, Law No: 555 Official Gazette published: 27.06.1995 / 22326
30) Regulation (EC) No 1898/2006. Council, 14.12.2006. Regulation laying down detailed rules of implementation of Regulation (EC) No 510/2006 on the protection of geographical indications of origin for agricultural products and foodstuffs.	**27)** The Implementing Regulations under the Decree-Law No 555 Pertaining to the Protection of Geographical Signs Official Gazette published: 5.11.1995/ 22454
31) Regulation (CE) No 1830/2003. European Parliament and the Council, 22.09.2003. Traceability and Labelling of modified organisms and the traceability of food and feed products produced from genetically modified organisms and amending Directive 2001/18/EC.	- Draft; Turkish Food Codex - Communiqué on Labelling of Food Products produced from Genetically Modified Organisms.
32) Directive 2001/95/EC. European Parliament and the Council, 3.12.2001. Directive on general product safety.	- The Law Relating to The Preparation and Implementation of The Technical Legislation on The Products, Law no: 4703, 11.07.2001/ 24459 (Article-5) (Under-Secretary for Foreign Trade (DTM))
33) Directive 89/396/ECC. The Council 14.06.1989. Directive on indications or marks identifying the lot to which a foodstuff belongs.	**28)** Turkish Food Codex - Communiqué on Determining the Marks or Symbols Belonging To Lot Numbers of Foodstuffs, Official Gazette published: 6.02.2002/ 24663 (2002/6).
34) Directive 496/90/EEC, The Council, 24.09.1990. Directive on nutrition labelling for foodstuffs.	**29)** Turkish Food Codex - Communiqué on Rules for General Labelling and Nutritional Labelling of Foodstuffs, Official Gazette published: 25.08.2002/ 24857 (2002/58).
35) Regulation (EC) No 1924/2006 European Parliament and the Council, 20.12.2006 Regulation on nutrition and health claims made on foods.	**30)** Turkish Food Codex - Communiqué on Foods Intended for Particular Nutritional Uses, Official Gazette published: 22.04.2002/ 24734 (2002/34)
36) Regulation (EC) No 2092/1991, Council, 24.06.1991. Regulation on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs.	**31)** Organic Farming Law, Law No : 5256 Official Gazette: 1.12.2004 **32)** Regulation on Essentials and Implementation of Organic Farming, Official Gazette published: 10.07.2005/ 25841
37) Directive 90/642/EC, Council 27.11.1990. Directive on the fixing of maximum levels for pesticide residues in and on certain products of plant origin, including fruit and vegetables. **38)** Directive 76/985/EEC, Council 23.11.1976. Directive relating to the fixing of maximum levels for pesticide residues in and on certain fruit and vegetables. **39)** Regulation (EC) No 396/2005 The European Parliament and the Council. Regulation on maximum residue levels of pesticides in or on food and feed of plant and animal origin and amending Council Directive 91/414/EEC.	**33)** Communiqué on Maximum Residue Limits of Plant Protection Products in Foods, Official Gazette: 11.01.2005/ 25697 (2004/42). **34)** Communiqué on Sampling Methods for the Official Controls of Levels for Pesticide Residues in and on Food, Official Gazette: 2.12.2006 (2006/51).
40) Regulation (EC) No 1881/2006. Commission 19.12.2006. Regulating setting maximum levels for certain contaminants in foodstuffs.	**35)** Turkish Food Codex Communiqué on Determining the Maximum Levels of Certain Contaminants in Foodstuffs, Official Gazette: 23.09.2002/ 24885 (2002/63).

Annex B: Accredited organisations dealing with food quality assurance

Testing laboratories	Accreditation	Place	Type
Provincial Control Laboratories of TKB	TS EN ISO/IEC 17025:2005	Istanbul	Public
Provincial Control Laboratories of TKB	TS EN ISO/IEC 17025:2005	Izmir	Public
AYDIN Mercantile Exchange Private Food Control Lab.	TS EN ISO/IEC 17025:2005	Aydin	Association
Provincial Control Laboratories of TKB	TS EN ISO/IEC 17025:2005	Ankara	Public
Provincial Food Control and Research Institute Laboratories of TKB	TS EN ISO/IEC 17025:2005	Bursa	Public
Provincial Control Laboratories of TKB	TS EN ISO/IEC 17025:2005	Mersin	Public
Provincial Veterinary Control and Research Institute Laboratories of TKB	TS EN ISO/IEC 17025:2005	Etlik/ Ankara	Public
Provincial Control Laboratories of TKB	TS EN ISO/IEC 17025:2005	Samsun	Public
GAZIANTEP Mercantile Exchange Private Food Control Lab.	TS EN ISO/IEC 17025:2005	Gaziantep	Association
SANITER Food – Environment Sciences Tech. Eng. Cons. Inc.	TS EN ISO/IEC 17025:2005	Istanbul	Private
GURSOY Agricultural Products Inc. Private Food Control Lab.	TS EN ISO/IEC 17025:2005	Ordu	Private
Provincial Control Laboratories of TKB	TS EN ISO/IEC 17025:2005	Konya	Public
Provincial Control Laboratories of TKB	TS EN ISO/IEC 17025:2005	Gaziantep	Public
Provincial Control Laboratories of TKB	TS EN ISO/IEC 17025:2005	Trabzon	Public
POLATLI Mercantile Exchange Grain Technologies Lab.	TS EN ISO/IEC 17025:2005	Ankara	Association
ADAPAZARI Mercantile Exchange Private Food Control Lab.	TS EN ISO/IEC 17025:2005	Sakarya	Association
Middle East Technical University Food Control Lab.	TS EN ISO/IEC 17025:2005	Ankara	Public University
EUROLAB Inc. Private Food Control Lab.	TS EN ISO/IEC 17025:2005	Istanbul	Private
KONYA Mercantile Exchange Private Food Control Lab.	TS EN ISO/IEC 17025:2005	Konya	Association
Provincial Control Laboratories of TKB	TS EN ISO/IEC 17025:2005	Tekirdag	Public
Provincial Control Laboratories of TKB	TS EN ISO/IEC 17025:2005	Kocaeli	Public
Provincial Control Laboratories of TKB	TS EN ISO/IEC 17025:2005	Adana	Public
EGE CHELAB Food and Indusrial Analysis Lab.	TS EN ISO/IEC 17025:2005	Izmir	Private
Provincial Control Laboratories of TKB	TS EN ISO/IEC 17025:2005	Denizli	Public
PİA FRUCHT Food Logistic Inc. Private Pia Food Control Lab.	TS EN ISO/IEC 17025:2005	Manisa	Private
BATAL West Mediterranean Agricultural Researh Lab.	TS EN ISO/IEC 17025:2005	Antalya	Private
Provincial Control Laboratories of TKB	TS EN ISO/IEC 17025:2005	Kayseri	Public

Quality management	Accreditation	Place	Type
TSE	TS EN ISO/IEC 17021	Ankara	Semi- Public
TURK LOYDU VAKFI	TS EN ISO 9001:2000	Istanbul	Private
NİSSERT Inc.	TS EN ISO/IEC 17021	Ankara	Private
MEYER Inc.	TS EN ISO 9001:2000	Istanbul	Private
TÜV Inc.	TS EN ISO/IEC 17021	Istanbul	Private
BEC Inc.	TS EN ISO 9001:2000	Kocaeli	Private
TÜV SÜD Inc.	TS EN ISO 9001:2000	Istanbul	Private
Moody International Inc.	TS EN ISO 9001:2000	Istanbul	Private
TÜV Rheinland Inc.	TS EN ISO 9001:2000	Istanbul	Private
ROYALCERT Inc.	TS EN ISO 9001:2000	Istanbul	Private
SGS SUPERVISE Inc.	TS EN ISO 9001:2000	Istanbul	Private
KALİTEST Inc.	TS EN ISO/IEC 17021	Istanbul	Private
BSS Inc.	TS EN ISO 9001:2000	Ankara	Private
UKS Inc.	TS EN ISO 9001:2000	Istanbul	Private
STANDART BM TRADA Inc.	TS EN ISO 17021	Istanbul	Private
BBS Inc.	TS EN ISO 9001:2000	Ankara	Private
ALBERK QA Inc.	TS EN ISO 17021	Istanbul	Private
UNIVERSAL Inc.	TS EN 45012:2002	Istanbul	Private
AJA 9000 Inc.	TS EN 45012:2002	Istanbul	Private
SISTEMER Inc.	TS EN ISO 9001:2000	Istanbul	Private
KAS Inc.	TS EN ISO 9001:2000	İzmir	Private

BUREAU VERITAS Inc.	TS EN ISO 17021	Istanbul	Private
TRB Inc.	TS EN ISO/IEC 17021	Istanbul	Private
CLASSIFICATIONS AND QUALITY SERVICES Inc.	TS EN ISO 9001:2000	Istanbul	Private
AKIS Inc.	TS EN ISO 9001:2000	Istanbul	Private
AND Inc.	TS EN ISO 9001:2000	Istanbul	Private
Inspection body	**Accreditation**	**Place**	**Type**
BUREAU VERITAS Inc.	TS EN ISO/IEC 17020 'Type A' Inspection Body	Istanbul	Private
TÜV SÜD Inc.	TS EN ISO/IEC 17020:2005 'Type A' Inspection Body	Istanbul	Private
Product certification	**Accreditation**	**Place**	**Type**
ORSER Organic Products Inc.	TS EN 45011	Ankara	Private
EKO-TAR Control Inc.	TS EN 45011	Mersin	Private
CTR International Cert. Inc.	TS EN 45011	Ankara	Private
Personal certification	**Accreditation**	**Place**	**Type**
TSE	TS EN ISO / IEC 17024	Ankara	Semi-Public
TQNET Inc.	TS EN ISO / IEC 17024	Izmir	Private

(as of end 2008)

Annex C: Participants list workshop 'Food Quality Assurance Schemes in Candidate Countries: Turkey' (FQAS-TURK), Antalya, October 7-8, 2008

Name/ Surname	**Institution**
Atilla Gerçek	TPE (Turkish Patent Institute)
Şengül Kutlufan	TPE (Turkish Patent Institute)
Serdar Açıkgöz	TKB TUGEM – ITU Department
Dr. Ayşe Gümüş Karaca	TKB Antalya Provincial Laboratory
Osman Uysal	Antalya Exportation Union
Fatma Akyol	TKB TUGEM – Organic Agriculture Department
Çiğdem Kılıçkaya	DTM – DTS (Standardisation in Foreign Trade)
Celile Dölekoğlu	Mersin University
Fatma Pişirici Gür	TSE (Turkish Standardisation Institute) Ankara
Dr. F.Zehra Özkan	MPM (National Productivity Center)
Dr. F. Handan Giray	EC JRC-IPTS
Hanife Ayan	TKB KKGM – Food Inspection Department
Ümmihan Özbey	TSE (Turkish Standardisation Institute) Antalya
Gülşah Pekdemir	Bureau Veritas (Private Certification Company)
Mustafa Yağcıoğlu	Izmir Mercantile Exchange (having PDO)
Gülşen Keskin	TKB TEAE (Agricultural Research Institute)
Project Team	
Prof. Dr. Ahmet Ali Koç	Akdeniz University
Assoc. Prof. Dr. Hami Alpas	METU (Middle East Technical University)
Serhat Aşçı	Akdeniz University

Annex D: Workshop 'Food Quality Assurance Schemes in Turkey: problems and proposed solutions'

WORKSHOP
Food Quality Assurance Schemes in Turkey: Problems and Proposed Solutions

Place: Middle East Technical University
Culture and Convention Centre
(http://www.ccc.metu.edu.tr)

26 November 2008 METU-Ankara

WORKSHOP PROGRAM

$08^{30} – 9^{00}$	Registration
$9^{00} – 9^{30}$	Opening Speech: Prof. Dr. A. Ali Koç FQAS-TURK Project Leader, Akdeniz University, Department of Economics
$09^{30} – 10^{30}$	FQAS-TURK – Primary Works *Food Quality Assurance Systems in Turkey* Serhat Aşçı, Akdeniz University, Department of Economics
$10^{30} – 10^{45}$	Coffee / Tea break
$10^{45} – 12^{15}$	FQAS-TURK – Results of SWOT Analysis and Field Works *Strength and Weakness of Food Quality Assurance Systems in Turkey* Assoc. Prof. Dr. Hami Alpas, Middle East Technical University, Department of Food Engineering *Interest, Knowledge Level and Expectations of Local Partners and Producers from Food Quality Assurance Systems in Turkey* Prof. Dr. A. Ali Koç, Akdeniz University, Department of Economics
$12^{15} – 13^{45}$	Lunch
$13^{45} – 15^{15}$	First Session *Discussion on Food Quality Assurance Schemes in Turkey*
$15^{15} – 15^{30}$	Coffee / Tea break
$15^{30} – 17^{30}$	Second Session *Improvement of Preliminary Logical Framework Matrix (LFM) Analysis* Concluding Discussion Prof. Dr. A. Ali KOÇ, Akdeniz University, Department of Economics

Participants list of the workshop 'Food Quality Assurance Schemes in Turkey: problems and proposed solutions'

Name / Surname	**Institution**
Prof. Erol Şengur	BESD – BIR (Poultry Meat Producers and Breeders Association)
Serkan Özbudak	TÜRKIYEM – BIR (Turkish Feed Manufacturers' Association)
Hasibe Işıklı	DPT – State Planning Organisation
Atilla Gerçek	TPE (Turkish Patent Institute)
Serap Tepe	TPE (Turkish Patent Institute)
Hanife Ayan	TKB KKGM – Food Inspection Department
Emel Tuğrul	Köy-koop – Central Union of Development Cooperatives
Taylan Kıymaz	DPT – State Planning Organisation
Project Team	
Prof. Dr. Ahmet Ali Koç	Akdeniz University
Assoc. Prof. Dr. Hami Alpas	METU (Middle East Technical University)
Serhat Aşçı	Akdeniz University

Annex E: 'Participatory Rapid Rural Appraisal' questionnaire

Name of the Village: **Population:**
Phone number of the manager of the cooperative:
1- General Demographics:
a. Number of houses in the village_____
b. What is the main source of living? _____
c. What are the major animal and vegetable products in your village? _____
d. How do you sell/market your products? _____
e. Where do you sell your products to? (EU, Russia, supermarkets) _____
f. Do you have producer organisations/cooperative in your village/town? _____
g. If there is, what is the name and how many members are there? _____
h. What is the role of the cooperative in product management, marketing etc.? _____
i. What is the annual income of a household on average living stand arts? ……..
What percentage of this comes from agricultural production? .....
j. What are the sources of employment and income other that agricultural sources? …….

2- The Awareness Level about Food Quality?
a. What do you understand from food quality?
☐Hygiene ☐Standard ☐Special product ☐Expensive product ☐Others_____
b. What are the unique products of this area?
c. What makes this product(s) special to this area?
- Is this special product(s) produced only in this area?
- Is this special product(s) process only in this area?
- The special product of this area is unique and different from others due to production/processing/traditional/or factors listed below…….
- Others …….

d. How can you differentiate your products from other similar products (brand, package, name, etc.)?
e. Are there any products claiming that they are the same with your product or has the same name?
f. What are the differentiating regional quality attributes of the most important product that your are producing?
g. What is organic agriculture? Do you know?
h. What are good agricultural practices (GAP)? Have you heard about it?
i. What is PGI? Have you heard about it?
j. Do you have organic agricultural production and/or GAP in your area? _____
If yes, which products? _____
In which enterprises and what is their capacity? _____
k. Do you have any regional interest to make organic agriculture, GAP etc?
l. What would be the advantage(s) of making organic agriculture, GAP, etc to you and to the region?
m. Do you have any products with PGI?
- If yes which products? When and how?
- How long did it take to have it? ……How much did it cost? .....
- Does the price of the product change after obtaining PGI?

3- How do you produce the products in your area? Would you mind classifying them in order of significance?

Products (significance order and variety)	Approximate planting area	Number of producer	Major method of production

Note: what is the average size of the plants? The number of small and large plants?

4- What are major changes in the agricultural production (vegetables, fruits, dairy, and animal) that has taken place during the last decade in your area?

a. Increase in size of the plants (what is the increase on the average)
b. Small plants leave the agriculture production (reasons?)
c. Change(s) in the production methods (how?); Technological changes (what are they?)
d. Changes in the processing methods of the plants (drying, processing, others)
e. Organisation of the producers (in what level?)
f. Increasing interest to quality production (how?)
g. Changes in marketing strategies (who are the new customers? new marketing channels?)
h. Changes in profitability (decrease, increase, why?)

5- What are the advantages and disadvantages in agricultural production that you are making good profit in your area?

Product name	Advantages	Disadvantages

6- About the products that you are making good profit mentioned above, what type of investments are made by the producers?

Products (variety list)	Type and cost of investment*	Financial source

*e.g. Greenhouse (plastic, glass etc.), irrigation by drops, heating systems, enlargement of the plant (buying land), animal for breeding, new garden, buying new equipment-machinery etc.

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Abstract

In 2008 and 2009, JRC-IPTS cooperated with Akdeniz University (UNIAKD) to analyse food quality assurance schemes in Turkey. The governance structure of food quality assurance in Turkey is explained, which includes public, semi-public and private institutes, laws and legislations, policies and research. Lack of consumer and producer quality awareness is determined as the main problem by SWOT and Logical Framework Matrix (LFM) studies. A Rapid Rural Appraisal (RRA) study was conducted by interviewing local stakeholders. Turkish producers' knowledge is limited and their quality perception focuses mainly on food safety. There are barriers in exports due to quality that reduce the Turkish share in world food markets. The study concludes with several recommendations on how problems in Turkish food quality assurance schemes could be effectively overcome.

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