

# Vertical integration in the food industry and contract farming

## The case of Turkey

Erkan Rehber

**Abstract:** *The relationship between farmers and the food industry ranges from carrying out spot market transactions to complete integration, characterized as vertical integration. In this study, the relationship between farmers and the food industry has been investigated focusing on contract farming. The Turkish food industry is a promising sector, but still has a dual structure with some small-scale manufacturing alongside larger plants employing modern technologies. The two main cooperative associations of Turkey, Trakyabirlik and Marmarabirlik, have considerable interests, especially in sunflower, olive and vegetable oil processing. Balikesir, Bilecik, Bursa and Canakkale provinces, the regions where the present investigations were conducted, have well developed vegetable, fruit, hop and sugar beet processing, tomato paste and frozen food industries. In the dairy, olive and vegetable oil industries, most firms have relied upon open market purchase to provide raw materials, whereas one of the widespread means of vertical coordination in this sector is contract farming. The share of contract farming, especially in tomato and pea growing, may be anywhere between 1 and 100%, with an average of 75%. Sixty per cent is more typical for hop production. Sugar beet growing can only realistically be accomplished via contract farming. Contract farming is potentially beneficial, especially for small farmers, providing various services, credit facilities, etc, although there are some inherent problems in implementation. Farmers could, however, solve many of the problems involved in contract arrangements by establishing organizations to undertake cooperative bargaining on their behalf.*

**Keywords:** *vertical coordination; contract farming; food industry*

*The author is Professor of Agricultural Economics and Head of the Department of Agricultural Economics, Uludag University, Faculty of Agriculture, 16159 Gorukle-Bursa, Turkey.  
E-mail: rehber@uludag.edu.tr.*

Turkey is a country in transition from an agricultural to an industrialized economy, and while considerable progress has been achieved, some fundamental problems still exist in agriculture compared with some other industries. As a developing country, the contribution of agriculture to national income and export value has been decreasing since the 1996 values of 13.4% (excluding forestry, fishery and the food industry) and 11.45% respectively (ICC, 1998), but there has not been a matching fall in the size of the rural population and active

labour forces employed in agriculture, which were about 35% and 45% respectively (SPO, 1995). These figures constitute one of the main obstacles to the success of Turkish agriculture.

One solution is to decrease the size of population engaged in agriculture by creating new employment opportunities, either in non-agricultural industries and the service sector, or in agriculturally based industries such as food processing or textiles. Development of the food industry not only provides new employment

opportunities and increases national incomes via accruing added value, but is also a way of supplying sufficient quantities of safe processed food to national consumers.

One of the important preconditions for the development of the food processing industry is to have enough demand in both domestic and foreign markets. There is also a key need to have access to plants that have modern technologies and are of a size capable of processing sufficient amounts of agricultural products. The continuous provision of sufficient, safe raw materials is vital for the establishment of a sound food industry. That is why great importance is attached to the vertical relationship between growers, producers, processors and traders of agricultural commodities. Vertical coordination has gained attention in the agricultural industries as a device for providing both cost and product quality advantages (Roy, 1963).

Despite the many incentives devoted to the sector in the five-year development plans since 1960, the food industry has not been able to reach the desired level in Turkey. Although it is difficult to find reliable data in Turkey, it can be estimated that food that has been subject to some degree of processing is no more than 10–20% of total food supply, whereas the figure is of the order of 60% in the developed world. Even so, over the period of planning, growth rates in the food industry of between 4% and 7% have been seen. The most important problem concerning the development of the food industry is recognized as raw material procurement, which is considered to be related to aspects of the vertical coordination between farmers and industry.

The terms 'vertical coordination', 'vertical integration' and 'contract production' are often used interchangeably (Cramer and Jensen, 1988; Paarlberg, 1995). Of course vertical coordination is a rather broad term that encompasses all means of harmonizing vertically interdependent production and marketing activities ranging from spot markets through various types of contracts, to complete integration (Frank and Henderson, 1992).

In this coordination, the aim of the industry is to provide a steady flow of raw materials of a certain quality and quantity; the farmers' aim is to sell products on time at a reasonable price, but the two are interrelated. The economic problem is concerned with increasing value added through processing and sharing it amongst the partners. Remedying this problem will be of mutual benefit for both sides, as well as making significant contribution to economic growth (Minnot, 1993). The role of government through intervention and support policies is also an important factor in the solution of this problem.

One of the most widely used and fast growing ways of achieving vertical coordination in Turkey, as in the other developed and developing countries, is by employing contract farming. Contract farming has been promoted in the last three decades as an institutional innovation to improve agricultural performance in less developed countries, sometimes as a key element of rural development and/or settlement projects (Ghee and Dorall, 1992). This system was accepted and used as one of the promising institutional frameworks for the delivery of price incentives, technology and other agricultural inputs. Contract farming is sometimes called 'quasi integration'.

UK and American approaches are different. The UK view has drawn a sharp distinction between contract farming and vertical integration, which are seen as different alternatives (Barker, 1972). Moreover, the preference is to restrict the meaning of vertical integration to what has been called 'ownership integration'. American practice has been to regard contract farming as a form of vertical integration (Allen, 1972).

The use of production contracts is increasing in the developed world. For instance, in US agriculture from 1980 to 1990, the percentage of pigs produced under contract increased from 2% to 18%. In 1990 contract production accounted for 7% of food and feed grain production and 12% of cotton production, while more than 90% of broilers and 80% of processed vegetables were produced under contract (Kelley, 1994). The broiler industry in the USA is almost entirely vertically coordinated, as in almost all developed countries (Vukina and Poster, 1996; Rehber, 1998). In the European Union, the production support system has had a considerable role in the development of contract farming (EEC, 1984). One of the observed changes in the Spanish food industry, for instance, after joining the EU was the dramatic increase in contractual arrangements. The number of farmers involved in contract farming was only 28,000 in 1986, but by 1988 it had reached 77,000 (Erkan *et al.*, 1993). In Germany vertical integration through contract production accounted for around 38% of production in the dairy, poultry and sugar sectors. Outside these sectors, however, only about 6% of output was produced under contract (Grosskopf, 1994).

Coordination between producer/grower and food processing units in a proper way is not only significant for the development of a sound food industry, but it is also important in securing improvements in farmers' welfare and the development of agriculture in general. Without well functioning vertical coordination it is not possible to develop agriculture and agriculture-based industries that meet increasing domestic and foreign food demands.

In this study we have examined the extent of vertical coordination in the Turkish food industry, identified some of the related problems and alternative solutions, both for the region investigated and the whole sector, in the light of experience of the developed world. Special importance is attached to contract farming as a worldwide alternative to vertical coordination, but especially in the region investigated and in the whole of Turkey.

## Data collected

The Bursa region, which comprises Bursa, Balıkesir, Canakkale and Bilecik provinces, was selected as the study area since it is where the main food processing plants are located.

Fruit and vegetable processing, dairy, sugar beet, olive, vegetable oil and hop industries have all been included in the research because of their distinguishing features and because of their use of contract farmers. The data were collected from 25 processing plants, which recognized the importance of vertical relationships and which had been procuring large amounts of raw materials via contracts with a considerable number of farmers. One hundred

farmers were interviewed, 75 of whom (three per plant) were contract farmers and 25 (one per plant) did not have any contractual relationship. From these, only 91 questionnaires could be evaluated, but 25 different contracts were examined.

### Structure of food industry in the region and nationwide

It has generally been agreed that the food processing industry is a key industry, which should receive high priority both at national and international levels (UN, 1981). Moreover, it promotes development in other sectors through forward and backward linkages. The food processing industry is important to economic growth and to people's health, especially in developing countries where many food raw materials are not fully utilized, foods are imported, food shortages exist and diets are inadequate. It has long been recognized that developing countries such as Turkey must develop their food resources more intensively (UN, 1969).

Although the development of the Turkish food industry was initiated with the foundation of the Republic in 1923, and the first sugar factory was established in 1926 (Hershlag, 1958), considerable progress has only been achieved through the five-year plans and annual programmes that were started in 1963. This progress was accelerated in the 1970s by market-oriented policies instead of inward-looking strategies and after 1980 when comprehensive liberalization and structural adjustment programmes were introduced (Uygur, 1995).

According to the 1990 Industry Census of Turkey, there were about 25,368 firms of different sizes in the food industry. However, only 500 of them were higher-capacity factories with access to modern technologies; about 2,000 of them were of somewhat lower capacity, and the remainder were of small size without any well developed technologies (MARA, 1993). Fifty-three per cent of these plants were grain mills and bakeries, 17% dairy and dairy products and 16% fruit and/or vegetable processing plants. The food industry held 15% of the total employment in manufacturing industry, adding 13% to the total value added by manufacturing industry (Cetin *et al.*, 1996).

Total production capacity of the food processing industry was 38,246,928 tons in 1990, but this met only 31% of domestic demand. Shortages still existed because of the rather low use of capacity almost throughout the entire industry.

According to the 1996 data, the manufacturing industry's share of total domestic GNP was 23.36%, and the food processing sector had the highest share in manufacturing sector income (ICC, 1998). Exports by the sector had also increased, and by 1996 the total amount of Turkish exports was valued at \$23,168 million, 9.75% of which (\$2,652 million) came from the food industry. On the other hand, food imports amounted to \$1.7 million or 4% of the total value of imports (ICC, 1998).

The Bursa region had 6.2% of the total number of plants, 8.2% of the established capacity and 7.4% of the total production of the Turkish food industry in the 1990 Census (MARA, 1993). Although these figures reveal rather trivial amounts, especially for items such as frozen food, the tomato paste, vegetable oil, dairy and hop

industries all are well developed in the region. It is not possible to find reliable data about the shares of each province in the region, but it is well recognized that this region is the most important in the Turkish food industry. For instance, hop production and processing are only found in Bilecik province (Rehber, 1989). Bursa province has produced more than 55% of Turkey's tomato paste (Akgul and Rehber, 1993) and almost 50% of its frozen food (Aslan, 1985).

### Vertical integration and contract farming

The first sugar beet processing factory was established in 1926 (Hershlag, 1958) and this date could also be accepted as the beginning of contractual relationships between producers and the industry. From a historical perspective, a triple structure appeared in Turkey as in other Western countries. State enterprises (SEs) had been established for processing sugar beet, meat, fish and milk. These are now subject to privatization and some plants have already been privatized in the last decade. SEs in Turkey have thus played a significant and pioneering role in the food industry, as they have in the other sectors from the beginning of the Republic, although they have suffered much criticism since the 1980s. In 1994, 407,350 farmers in the whole of Turkey produced sugar beet under contract with SEs. Contract farming was not limited only to the sugar industry, but the General Directorate of State Farms had also grown some field crops and improved seeds under contract.

The second type of organization in the food industry is the cooperative. However, only village development cooperatives in Turkey are accepted as agricultural cooperatives under the description offered by the International Cooperative Alliance (Rehber, 1993). The first sale cooperative was established in 1911 to process figs. According to the 1993 data, there were 433 agricultural sale cooperatives (ASC), 13 ASC unions and 732,514 member farmers. Some of the big food processing plants still belong to these cooperative organizations. Sale cooperatives take shares in the dairy, olive oil, vegetable oil, fruit juice and flour industries of 2.9, 6.8, 9.7, 5 and 1% respectively (Mülayim, 1995). However, there are serious institutional, financial and managerial problems. They were mainly financed from state sources and have been acting as SEs, which explains why the term 'privatization' is used incorrectly for these organizations (Rehber, 1995). Sugar beet producers, tea producer cooperatives and village development cooperatives, which also have some food processing and handling plants, must be considered here. Because producers, the suppliers of the raw materials, may also be the owners of the processing units, it may be construed that there will be no problems between farmers and processors. But this is not so, and there can be many problems and disputes, especially when alternative marketing opportunities are available.

The third and most promising part of the food industry is constituted by the private sector, which has been developing rapidly, especially through relatively big private corporations, which engage with and become recognized in the changing and globalized market conditions of the world.

When we evaluated the structure of the Turkish food industry from the point of view of vertical coordination, the relationships varied from spot market transactions, to long established customer–client relations and to contractual arrangements. Furthermore, while spot market transactions dominated some subsectors, contract farming was the only way of vertical coordination in others.

In the region studied, contractual relationships, along with spot market transactions, were observed widely, mainly in the tomato paste, vegetable and fruit processing industries. In these subsectors the share of contractual arrangements has varied between 1 and 100%, whereas it has averaged about 75% in tomato and pea production. In the dairy industry there were no straightforward contractual links between producers and dairies. About 60–70% of the raw milk was sold on the open market and the remaining 30–40% was handled in some kind of open-auction system. On the open market, processors either have their stable or mobile procurement centres, or buy raw milk through brokers and other middlemen.

In the auction system, as widely used in Balıkesir province, producers are organized under a cooperative or mostly under village service unions, which are semi-governmental organizations. These village service unions have an active role in organizing auctions for the benefit of farmers. The role of these organizations resembles that of bargaining cooperatives in the USA (Marcus and Frederick, 1994). However, there are some problems in practice.

All sugar beet production has been processed in Turkey since the beginning of the industry under contract by stock companies, which are a type of SE. There are also sugar beet producer cooperatives. The relationship between companies and producers was being developed by these cooperatives. Until 1994, a farmer who was in a contractual relationship with a company had to be a member of the producer cooperative, but after 1994 this was no longer a requirement, and the role of cooperatives is not now important. However, after the privatization period of the 1980s, contract provisions were being determined in favour of the farmers by the producer cooperatives, which now owned some of the factories that were previously run as SEs (Pankobirlik, 1994). It was argued that this ownership integration through producer cooperatives had increased the financial efficiency of the privatized plants, as had occurred in the USA (Koenig, 1995). Indeed, because sugar beet prices are subject to the government price support system and are determined by the government, there would not be any difference in farmers' income through this type of integration. The increased efficiency in the grower-owned factories could have been achieved through efficient management and better-organized delivery and payment procedures.

It was observed that, in the olive processing and vegetable oil industries' cooperative organizations, there were more spot market transactions and long-standing customer–client relationship contracts. Marmarabirlik (the Marmara Union of Olive Sale Cooperatives) in olives and Trakyabirlik (the Edirne Union of Oil Seeds Sale Cooperatives) in sunflower seed processing have significant shares, and also have a regulatory role in the table olive, olive oil and sunflower oil markets. In the

region studied, some olive producers are also members of TARIS (comprising top management of four agricultural sale cooperatives) which is located in the Aegean region. Marmarabirlik, which is a sale cooperatives union, has the biggest share in olive processing and marketing in the region with its eight local cooperatives and 37,418 members. Trakyabirlik is also a very efficient nationwide union, which has 48 local cooperatives and 138,806 members. This union's share was about 34.4% of the sunflowers grown for oil production in Turkey in 1995 (Dayanikli, 1995). However, as mentioned before, some of these agricultural cooperatives have difficulties.

Hop production was included in the scope of this research because of its interesting features concerning producers and industry relationships. In the hop industry, the private sector, a state enterprise and a farmer cooperative organization have been sharing the market. One private company tries to grow some hops on its own plantation, alongside a contractual relationship with farmers in an out-grower scheme (Glover, 1987). Other private companies and the state monopoly are in the market only during the harvesting season as buyers with an advance-paid price system. There is also a farmers' cooperative organization as a third alternative. In such a structure, despite favourable offers, the private company could not manage to increase the number of contractee farmers or take its market share over 60%. There is real competition between the farmers' cooperatives and private companies. The important role of the cooperative in marketing shows the importance of the farmers' organization in contractual relationships and of the bargaining power that can be exercised through being organized collectively (Koenig, 1995; Ling and Liebrand, 1995; Rehber, 1996).

## Structure of contract farming

### *Content of contracts*

Twenty-five contracts have been examined. There was no special legislative base for production contracts in Turkey until 1996, and they were prepared mainly on the basis of the sample contract of the Turkish Sugar Industry Stock Companies or according to the personal choices of the negotiators.

There were some differences in the detail of the contracts; generally the legal language has been such that it was not easily understood by farmers. In practice they were arranged by the processors and, in consequence, the terms are more related to what processors should do and not what producers and processors need to agree upon. Contracts generally comprise four main sections (Buccola, 1980; Rehber, 2000). In the first section, both parties are defined; in the second, the economic provisions of the contract and the responsibilities of both parties are presented. In the third section, technical conditions are drawn up; while the last section includes the authority that is responsible for resolving disputes and dissatisfactions. The signature and authorization section is normally at the end.

The length of contracts was usually one year, the only exceptions being hop production contracts, which span more than one year. Eighty per cent of the contracts

examined were based on tonnage, while 20% had an acreage basis. The contracts were signed by an individual producer or by a producers' group, in which all producers were responsible reciprocally to each other. On the other hand, each producer group might have a representative, a responsible producer who had the right to change or add provisions to the contract in the name of all group members, and also acted as the representative of the processor. About 60% of contracts are negotiated in this way. Although the contract itself is a document that indicates both the producer's and processor's responsibilities, a producer may have to sign an extra responsibility receipt, especially when he has obtained some inputs or payment in advance. Such payment in advance occurred in about 76% of contracts, but only in about 60% was it an item in the contract identified as a 'depth' or 'responsibility' receipt.

The pricing and payment systems varied from contract to contract. Thirty-six per cent of contracts were fixed price, whereas a constant price plus a premium system was used in 44% of the investigated contracts.

### Contracts from the producers' perspective

Interviews were conducted with the 75 contractors and 16 farmers who did not have contractual relationships. Sixty-five per cent of the contractors produced field tomatoes. Contract farming is also widely used in the production of broccoli and green peppers. Sugar beet and tobacco production are subject to contractual relationships, as is the case for the whole of Turkey. Of the farmers who were interviewed, 62% cited the guaranteed price and sale as the main reasons for signing a contract. The provision of credit facilities and technical support was indicated as a secondary reason. Producers generally interpret contracts as a means of coordination and they are not interested in the detail of contracts. Fifty-four per cent of the producers who replied to questions about contract provisions said that they had not read the contract beforehand, they had just signed it. Of those who had read the contract, only 20% felt they could understand the details. Sixty per cent of the farmers expressed some worries about the originator of the contract's responsibilities, such as delays in payment and delivery, inadequate technical support and information, etc. Processors would like to spread delivery over long periods, but producers feel that it causes delays that lead to losses of product quality and hence any quality premiums that may be due.

The farmers interviewed did not always support the notion of groups signing contracts on behalf of individual producers. For example, in sugar beet production, each group consisted of 30 farmers. The first farmer on the list was identified as the group leader and the second one as vice-leader. They signed the contract in the name of all group members, but many members of the group considered that these people did not necessarily act for the benefit of all members. In these circumstances, there is little benefit to the producers, but overwhelmingly a sound guarantee for the processor, and farmers then simply considered their leaders to be representatives of the processors. Almost all of the producers would prefer to have contracts authorized by a third party, preferably a representative of the Farmers' Union or Directorate of

Agriculture, or by the so-called 'muhtar' (the elected head of a village).

Ninety-five per cent of farmers would like to see the establishment of bargaining cooperatives, as widely seen in the USA, but two-thirds recognized the difficulties of establishing such mechanisms.

Of the 25 farmers who were not involved in a contractual relationship, the questionnaires of only 16 farmers have been evaluated. Seventy-three per cent of them indicated that they were familiar with contract farming, and 56% had had contracts before. The prime reasons for giving up included disputes related to price and methods of payment. As is the case in hop production, these dissatisfactions, together with the availability of other marketing alternatives, have caused a bias against contract farming. But also as in hop production, even contracting farmers looked for other alternatives to decrease market risk.

### Contracts from the processors' perspective

Processors prepare contracts and inevitably determine the conditions of the contracts. However, most of the processors interviewed agreed that not all the contract provisions could be realized and consequently contract production often could not deliver raw materials of the required quality and quantity.

The processors argued that farmers were reluctant to use modern inputs and technologies of the kind that were generally recommended by their field experts. They also considered that the most important problems they encountered were to do with the purchasing of commodities and with payment. All product prices, except for sugar beet, which is subject to government intervention, are affected by the price on the open market, regardless of the price stated in contracts. When the spot market prices were higher than the contract prices, farmers were accused of selling the goods produced under contract on the open market. In order to avoid this, the farmers are forced to sign an 'open debt receipt' in addition to the contract. Moreover, farmers who act repeatedly in the same manner have been punished by not being allowed to arrange a contract for a few years. On the contrary, when the contract price is higher than on the open market, farmers try to supply more products to the processor, which they have obtained from their relatives or from production not included in the contract.

There was competition between processing firms and also between provinces. When a shortfall in production occurs or the demand for processed food increases, those firms without contractors offer higher prices to the contractors or to other firms.

Another important problem for the processors is that, when there are disputes, the contract itself may have no value, and going to court is subject to long delays. The need for a mechanism for arbitration or conciliation is clear.

Processors who do not have any contract relationships consider that they can easily purchase the raw materials they need in domestic open or foreign markets, although 33% of them indicated that they could use contracts if they needed to.

## Conclusions

In Turkey, both farmers and processors have been familiar with vertical coordination through cooperative organizations and contract farming since the foundation of the Turkish Republic in 1923. Because of errors made by the agricultural cooperative movement, farmers have the notion that these organizations are similar to SEs. Even though the necessary reforms have been accomplished, it is not easy to change farmers' opinions (Mülayim, 1997).

Although farmers and processors have had experience of contractual arrangements for a long time, there is little or no legislative regulation of contract farming. One regulation was published in the Official Journal (Official Gazette) by the Ministry of Agriculture in 1996. Even though it was felt that its content and power were insufficient to impose sanctions, it was felt to be a step in the right direction and a realization by government of the need to do something about contract farming. While the role of the government is an important factor for successful implementation, it is not possible to put out a comprehensive contract model via strict legislation because of the tremendous variety of enterprises in agriculture. Instead, the government could determine a framework for the contracts and enact some regulation to solve disputes and take part in arbitration or conciliation. Government policies regarding tax, credit, agricultural insurance, and especially extension, must also be devised to create a beneficial environment. For instance, in the USA, marketing orders have strengthened the farmers' position in contractual relationships.

Contract farming is not a panacea for all problems related to agricultural production and marketing systems. However, contract farming could be seen as a way of providing easier access to credit, inputs, information and technology and a product market for small-scale farming.

Besides the mutual advantages of contract farming, there are some disadvantages that could create problems, such as losing some measure of independence for the farmer, creating a monopoly, etc. Some steps can be taken to offset any biased advantages of contract farming. In contractual arrangements, the role of the originator of the contract is important because it determines most of the production and marketing practices and measures. Therefore, the efficiency of the firms' activities directly affects the efficiency of contract farming. The first step in successful implementation is the establishment of a sound organizational body in the originator firms (Rehber, 1998 and 2000). Contracts could vary from company to company, but all companies should have a special unit that deals with all contractual issues and is furnished with the necessary personnel and equipment. Also, its relationship with other functions of the firm must be determined clearly (Brown *et al.*, 1994).

It is recommended that there should be an independent organization to resolve disputes between firms and farmers, which are the major cause of failure in contract farming. Mechanisms are clearly indicated for solving disagreements and disputes between producers and processors over quality standards, delays in delivery and payments, and defaults on loans, all of which can create

long delays while going to court. Thus an arbitration and/or conciliation system would be useful for involving government and non-governmental organizations' representatives (Spolter, 1992; Rehber, 1998).

Although the successful implementation of contract farming requires a measure of understanding about coordination and collaboration, acting in an organized manner is advisable for both sides. There is more reason for the individual producer to feel a lack of bargaining power. Bargaining cooperatives among farmers make them more powerful in contracted relationships (Scheid, 1991; Moore, 1994). Such organizations could allow more effective collaboration with processors. For example, the California Tomato Growers Association needed to take a more active role in controlling imports; this led to the formation of the National Association of Growers and Processors for Fair Trade (Marcus and Frederick, 1994). This had further success in imposing some regulations on imports and market development, political action and adjustments to consumer demand.

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