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215

**ECONOMIC SUSTAINABILITY OF SHORT FOOD SUPPLY CHAIN IN THE
ITALIAN OLIVE OIL SECTOR: A VIABLE ALTERNATIVE FOR TUNISIAN
AGROFOOD MARKET?**

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ABSTRACT

The recent proliferation of short food supply chains (SFSCs), such as the direct sale, meets farmers' needs to valorize local food productions and increase their profitability. The short food supply chain achieves the theoretical concept of sustainability in economic, environmental and social terms, giving life to multifunctionality in agriculture. In the Italian agrofood sector, the extra virgin olive oil is largely purchased in short supply chains. The aim of this paper is to determine if the direct selling in short supply chains for the extra virgin olive oil is profitable for farmers. In addition, this research stresses the importance of using a correct farm costs analysis for the identification of a selling price which valorizes the quality of the local products and at the same time ensures fair revenue to farmers.

Finally, the paper intends to propose short food supply chain as a valid alternative for Tunisian olive-oil market, in order to encourage local food production in economic and environmental sustainability.

INTRODUCTION

In the agrarian sphere we can postulate that value capture at the producer end of food supply chains has at least three potential dimensions. First, it suggests that local producers and their networks attempt to capture more of the economic value of their products in a prevailing context when more of this value is being lost to the down-stream sectors (Renting *et al.*, 2003). Second, it also suggests, that in order to achieve this it also requires new innovations in the mechanisms for distributing value among producers and processors at the local level. This involves new types of entrepreneurial activity which is socio-ecological in the sense that it is based upon distinctly different types of networks and activities. Third, these two types of value-capture can lead to new potentialities with regard to forging synergies between agricultural practices and different types of multi-functional activities such as agri-tourism, engagement in off-farm, incomes activities and environmental schemes and projects (Marsden and Smith, 2004). The recent development of different types of short food supply chains (SFSCs) including direct selling, farmers market, box schemes, etc, is due to the need of the farmer to generate revenue emphasizing local production.

The second half of the twentieth century witnessed dramatic changes in food production, distribution and consumption, leading to a weakening of the relation between the consumer and the producer and to asymmetric information in relation to food characteristics, origin and method of production. This was caused by the increasing development of intensive agriculture, the industrial processing of food and consumer habits which have stimulated technological innovation towards convenience foods. At the same time, in recent years, the farmer has faced a number of difficulties related to the inputs increase, to prices volatility and to international competition, which are leading to a dramatic decrease in income. In this context, the short food supply chain is one of the possible solutions to the economic sustainability of farm.

The aim of the present work is trying to determine the economic sustainability for farmers in the creation of a short food supply chain in Italy. This research stresses the importance of using a correct farm costs analysis for the identification of a selling price which valorizes the quality of the local products and at the same time ensures fair revenues to farmers.

Due to farms structural similarities (small and medium-sized family farms) and increasing agricultural production costs (Jouili, 2009), the short supply chain could be an additional sales channel for olive-oil market in Tunisia, where new quality policies and business strategies are taking place.

In order to illustrate the current state of diffusion of short supply chains (or “alternative”) in the global context, the paper proposes in the first section a review of the scientific literature on international and national level on the concept of “Alternative Agro-Food Networks” and “Short supply Food Chain” and “Local Food”. It is also proposed an analysis of data from the VI° Agricultural General Census 2010 regarding the scenario of direct sales in Italy (ISTAT, 2012).

In the second section, we present a descriptions of the direct sales in international market of, in quantitative and qualitative terms, analyzing the different types of sales of alternative food networks in different international contexts, with specific reference to Europe and in particular in Italy.

In the third section, we describe the olive oil sector in the word and especially in North Africa.

In the fourth section, we present a case study of olive oil short supply chain in Italy, which analyzes farm costs and revenues, including the description of profitability indicators.

Finally, the fifth section presents the discussions, with some remarks on policy implication for future application of short supply chains in Italy and in Tunisia and it also provides oriented business strategies to go toward more conscientious farmers’ models in the Tunisian olive oil sector.

1. THE ALTERNATIVE AGRI-FOOD NETWORKS

The development of alternative food chains has attracted much attention in recent years, with a new food politics beginning to fill gaps left by conventional government regulation and with the growing public concern over the provenance and manipulation of foods. From a rural development point of view, this new resurgence of interest in ‘more natural’ or ‘more local’ types of food comes at a critical time for the land-based production sector (Marsden et al. 2000).

Specialized networks in shaping local/regional in response to the deepening crisis of conventional agriculture, are potential sustainable platform for rural development (Marsden and Smith, 2004).

The literature illustrates the motivations and characteristics that have led to emergence of alternative agri-food chains (AAFNS), short food supply chains (SFSC) and the growth of the phenomenon of “local food”.

The term alternative food networks (AFNs) is here used as a broad embracing term to cover newly emerging networks of producers, consumers, and other actors that embody alternatives to the more standardised industrial mode of food supply (Murdoch et al, 2000).

Alternative food networks (AFNs) distinguish themselves from these global food regimes by building new producers-consumer alliances and creating experimental spaces to develop novel practices of food provision that are more in tune with their values, norms, needs, and desires, that built on the reproduction and revaluation of local sources, and that results in

better appreciated qualities. The reconfiguration of supply chains is an important mechanism underlying the emergence of new rural development practices. In AFNs food is reconnected to the social, cultural, and environmental particularities of the context or the “local” in which it is produced (Kirwan, 2004). Many of these alternative Agri-Food initiatives have been developed as a direct response and in opposition to particular aspects or characteristics of the dominant food system (Scrinis, 2007).

The AFNS can be described as forms of food supply with different characteristics, antagonistic to the conventional system which characterizes the developed countries (Tregear, 2011).

The SFSC concept is more specific than AFNs, and, rather, covers (the interrelations between) actors who are directly involved in the production, processing, distribution, and consumption of new food products. The term Short Food Supply Chain (SFSC) can be used in this paper as an umbrella term. We identify three main types of SFSC, all of which facilitate or enable the defining characteristics of a SFSC to exist – that being the ability to engender some form of connection between food consumer and food producer. The three main types of SFSC identified are:

1. *Face-to-face*: consumer purchases a product direct from the producer/processor on a face-to-face basis. Authenticity and trust are mediated through personal interaction. The Internet also now presents opportunities for a variant of face-to face contact through on-line trading and web pages.
2. *Spatial proximity*: products are created and retailed in the specific region (or place) of production, and consumers are made aware of the ‘local’ nature of the product at the point of retail.
3. *Spatially extended*: where value and meaning laden information about the place of production and those producing the food is translated to consumers who are outside of the region of production itself and who may have no personal experience of that region.

It offers potential for shifting the production of food commodities out of their ‘industrial mode’ and to develop supply chains that Food supply chain approaches can potentially ‘short-circuit’ the long, complex and rationally organized industrial chains (Marsden et al. 2000) within which a decreasing proportion of total added value in food production is captured by primary producers.

In the international literature studies are mainly aimed to identify the reasons that led to the creation of food webs defined “alternative”, “sustainable”, “local” (Marsden *et al.*, 2000, Murdoch *et al.*, 2000, Hinrichs 2003; Renting *et al.*, 2003) and to identify and characterize the different types of Short Food Supply Chain-SFSCs (Venn *et al.*, 2006; Abate, 2008; Rossi *et al.*, 2008).

The examples that have been studied regarding the Short Food Supply Chains-SFSC (Marsden *et al.*, 2000; Hinrichs, 2003; Renting *et al.*, 2003; Ilbery and Maye, 2005), the Farmers `Market-FMs (Holloway and Kneafsey, 2000, Brown 2002; Kirwan, 2004; Brown and Miller 2008; Pascucci *et al.*, 2011), Community-Supported Agriculture-CSA (Hinrichs, 2000; Allen *et al.*, 2003) or GAS in Italy (Brunori *et al.* , 2011, 2012b; Mariani *et al.*, 2011) and box schemes (Tregear, 2011).

Lastly, SFSCs are an important carrier for the 'shortening' of relations between food production and locality, thereby potentially enhancing a reembedding of farming towards more environmentally sustainable modes of production (Renting *et al.*, 2003).

However, the choice to take the path of SFSC seems suggested by the benefits described in the literature, such as increased revenues, the stability of demand due to customer loyalty, the ability to directly affect the price by reducing production costs related to costs transport and packaging (Cicatiello, 2008; Graziano, 2008; Aguglia *et al.*, 2009).

At the same time the producer can obtain a more adequate remuneration of production factors used, taking back a portion of the value which usually disperses in the various stages of the supply chain, and to become price-maker (Saccomandi, 1999, Mount 2012). For high-quality products (PDO, PGI, Bio), sold through the direct channel, the absence of intermediation seems to involve a significant impact on the price. Therefore these products are generally more convenient for consumers than those proposed by the large-scale retail trade (Carbone *et al.*, 2007; Aguglia *et al.*, 2009; Fritz and Martin, 2009). In short supply chain thanks to the establishment of a direct relationship of trust with the manufacturer, it is possible to increase the information about the quality of the product, the production method and origin of the commodities, overcoming the asymmetry information that characterizes conventional distribution channels (Marsden *et al.*, 2000; Venn *et al.*, 2006; Finco *et al.*, 2010; Sargentoni *et al.*, 2013).

The local food markets generate public benefits, that include economic development impacts, health and nutrition benefits, impacts on food security, and effects on energy use and greenhouse gas emissions (Edwards-Jones *et al.*, 2008; Peters *et al.*, 2008; Martinez *et al.*, 2010).

In summary, the economic benefits for farmers and rural communities can potentially include:

- local food systems have the potential to positively impact the local economy and the expansion of local foods may be a development strategy for rural areas, through: new or retained jobs, increased sales and a more diversified local economy that could make businesses more secure and stable;
- promotion of local products through direct marketing and processing of agricultural products in the company;
- creation of new markets for local products, such as the supply of schools and hospitals;
- high profitability due to the acquisition of part of share price that is normally lost in supply chain;
- conservation of tradition relating to specific types of local food products, varieties and native species (Holloway *et al.*, 2007);

Increased local food production and marketing is assumed to environment benefit by:

- lowering food miles that eventually reduce pollution and transport costs;
- encouraging farmers to adopt more environmental friendly production systems (e.g. organic farming);
- developing more informed purchasing decisions and consumer interest about the environment (Stopes *et al.*, 2007).

2. SHORT FOOD SUPPLY CHAIN IN THE WORLD AND IN ITALY

The chapter aims to illustrate the concept of agro food supply chain in the literature, the market size, both in money value and quantity terms, and define the different types of short food supply chain or alternative food networks in North America, in Europe and particularly in Italy.

The agro-food chain is defined as the set of interdependent elements that work together towards the end of satisfying food needs of a given population in a given space and time (Malassis and Ghersi, 1995).

The first activity to sale and purchase of local food products in short supply chain, have been developed in networks of producers and consumers and were characterized by forms of organized solidarity (re-socialization) and re-spatialization of production and consumption of food. These networks have spread around the world from about the sixties with the aim to link up the different organizations at national level. The most organized networks are created both in industrialized Western countries, such as networks Csa in the U.S. and the AMAP in France, in the East with the networks TEIKEI Japanese. The common objective of such initiatives, developed in different contexts, is to create direct links between the production company and the consumers. Secondly, these initiatives of "alternative" sale and consumption, are support by different actors (public authorities, associations and organizations), have the purpose to support the processes of local rural development, links with local communities and social integration (Guidi, 2009; Calori, 2009).

Recent forms of marketing short supply chain or direct sales were activated in the world mainly in countries with advanced economies, such as farmers' markets, box schemes, pick-your own:

- Farmers' market: the USDA (2002) defines the farmers' market as a system of direct sales with the pick-your-own, catalog sales, and Community Supported Agriculture.

The farmers markets was brought to North America from Europe and the first documented markets in America dates back to the seventeenth century. The first markets were the primary means of supplying fresh produce, such as dairy products, meat, fish, poultry urban cities (Sanderson et al, 2005). Today, the famers' market are very present in the U.S. and according to the data provided by the United States Department of Agriculture (USDA) in 2010 were surveyed 6,132 markets, with a growth of 350% since 1994 (USDA 2011). Over the last twenty years the number of farmers' markets in the U.S. has grown significantly, when the census data of 1994 USDA detected 1755 active markets. A survey of 2000, the USDA took over the strong 63% increase in active markets and companies participating in the order of 66,700, selling their products to consumers 2,760,000 a week, recording a total turnover of 888 million dollars , which was mainly represented in retail sales for 93% (USDA 2002).

In the UK, according to data from the National Farmers 'Retail & Markets Association (FARMA) farmers' markets amounted to about 750. FARMA, since 2002, has launched a special scheme for inspection and certification of the markets that provides additional quality assurance to consumers. Currently there are about 200 farmers' markets that have been certified. The main criteria for joining the certification are: products sold in farmers' markets must be produced within a maximum of 50 miles or ideally, 30 miles;

- Pick-your-own: Pick-your-own (PYO) or U-pick, is a form of direct sales will be collected directly in the field of agricultural products by consumers. This activity was present in: United States, Canada, Great Britain, Holland, Italy, Australia, New Zealand, South Africa.
- Box schemes: is a delivery of fresh vegetables, usually locally grown and organic, either directly to the customer or to a local collection point. A box scheme is usually operated by the grower or a small co-operative.

In Italy, the experiences related to SFSC is very broad and in recent years we have witnessed the emergence of many activities that differ in the promoters (public authorities, individual farms, agricultural producer organizations and movements of civil society groups consumers), the products processed (conventional and organic production methods), organizational methods of exchange. In particular, there has been a significant growth in direct sales, the farmers' market and joint purchasing groups (Mariani *et al.*, 2011). The short supply chain can be realized by different marketing systems: direct sales in farm, door to door, farmers' market, markets and fairs, purchasing group, e-commerce, consumer cooperatives.

3. WORD OLIVE OIL SECTOR

Olive cultivation has a millenary tradition throughout the World, especially in the Mediterranean basin, where it still plays a role of primary importance for the economy of the countries. Innovation in management techniques is a key challenge for the competitiveness of companies and the search for high-quality products is the prerogative to access remunerative markets.

3.1 Olive growing in the World and North Africa

The global production of olives in 2012/2013, according to the latest IOC (International Olive Council) estimates, is equal to approximately 2,315 million tons, with a decrease of almost 8% over the previous year. The major producing countries of olives turn out to be the European Union (666 ml tons), Turkey and North Africa. The olive oil world production in 2012/2013 amounted to about 2,718 tons, with a decrease of almost 20% over the previous year (Table 1).

Tab.1 World olive oil production (000.ton)

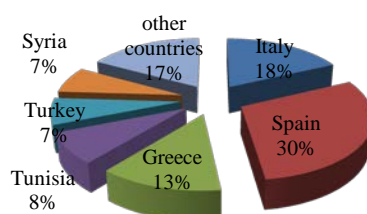
	2010/11	2011/2012*	2012/2013**
	a	b	c
	.000 ton	.000 ton	.000 ton
Algeria	67.0	54.5	56.5
Saudi Arabia	3.0	3.0	3.0
Argentina	20.0	32.0	17.0
Croatia	5.0	4.0	4.0
European Union	2,209.0	2,444.0	1,739.0
Israel	12.5	12.0	13.0
Jordan	27.0	35.5	35.0
Lebanon	32.0	18.0	18.0
Morocco	130.0	120.0	100.0
Montenegro	0.5	0.5	0.5
Lybia	15.0	15.0	15.0
Syria	180.0	198.0	198.0
Tunisia	120.0	180.0	220.0
Turkey	160.0	191.0	195.0
Egypt	4.0	10.0	6.5
Iran	4.0	7.0	6.0
Lebanon	32.0	18.0	18.0
Chile	16.0	21.5	21.5
U.S.	4.0	6.0	12.0
Australia	18.0	19.0	19.0
other Countries	15.0	15.0	15.0
world	3,075.0	3,408.5	2,718.0

Source: IOC, 2012

* Provisional data ** Data prediction

The main producing countries of oil in the World, currently are Spain (30%), Italy (18%), Greece (13%) and Tunisia (8%) (Fig. 1) (IOC, 2012).

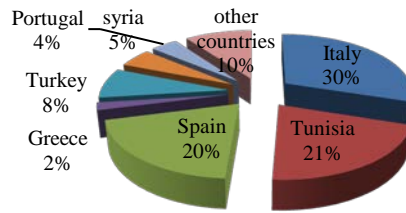
Fig.1 Incidence of major producer of extra virgin olive oil in the world



Source: IOC, 2012

Outside the European context, it must be emphasized the good performance of Tunisia, which should increase its production by 50% reaching 220 thousand tons of oil (IOC, 2012). Italy, with a market share of about 21% of the Community production in the year of 2010, records for 2011 a share of the production of about 440 thousand tons of oil produced (IOC, 2012). On the export side, more than 230 thousand tons of olive oil, were shipped across the Italian national borders, confirming not only the undisputed leadership of Italy (30%) and Spain (20%) among supplier countries, but also highlighting a steady progression in the coming years. It must be also underlined the importance of Tunisia as the largest exporter of oil in North Africa, playing today an important role for the oil marketing in the Mediterranean basin (Fig. 2) (IOC, 2012).

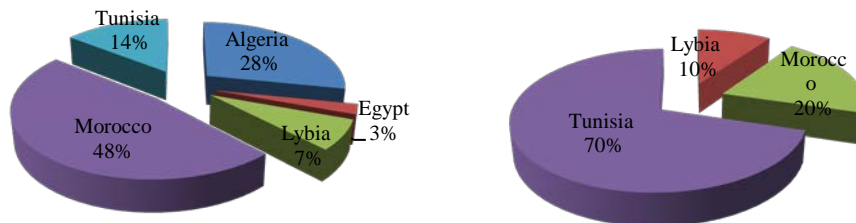
Fig.2 Leading exporters of oil in the World



Source: IOC, 2012

In Italy extra virgin olive oil is mainly imported from Spain (107 thousand tons), Greece (36,000 tons) and Tunisia. In North Africa, Morocco is the largest producer of extra virgin olive oil, with about 40% of total production, followed by Tunisia (36%). Regarding exporting countries, Tunisia seems to be the main actor devoting 70% of oil production to foreign countries. This is due to the policies adopted to date that have addressed producers and processors to the marketing of olive oil to foreign countries rather than in the country (IOC, 2012)(Fig. 3).

Fig. 3 Incidence% of the producers and exporters of olive oil in North Africa (.000 ton)

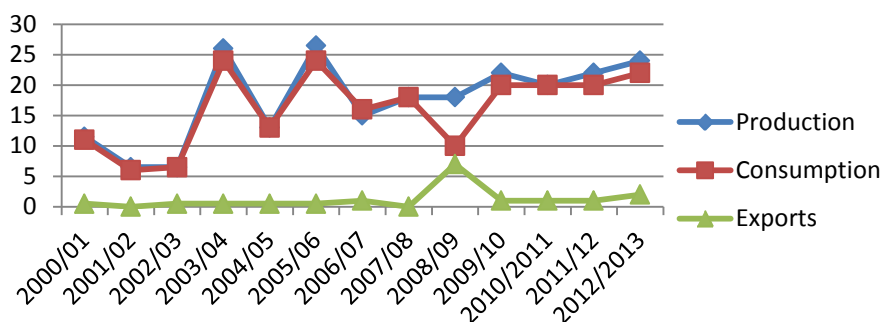


Source: IOC, 2011

3.2 Olive growing in Tunisia

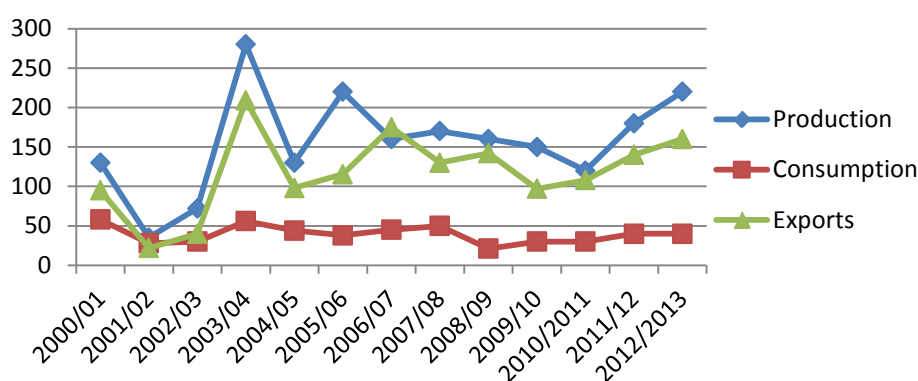
Tunisia is the most important country in the Southern Mediterranean that engages more than 30% of its arable land to the cultivation of olives. The olive culture plays a fundamental role in social and economic life and accounts for almost 15% of the total value of final agricultural production. The olive sector engages for the production phase, small and medium private and householder farms (28.5% of total agriculture farms) and for the processing phase 1,750 mills (Karray, 2012). International trade in olive oil represents 50% of total agricultural exports, making it the fifth-largest source of income for the country. Olive growing has also participated in the development of a regional balance, because it is the only crop cultivable in less favored regions, helping to keep people in rural areas. The resources of olives in Tunisia are estimated at more than 65 million trees grown on 1.8 million hectares (IOC, 2012), of which about 75,000 hectares belong to certified organic farms. Olive oil is the main exported product of the food industry with about 230,000 tonnes per year. For this reason, the production of extra virgin olive oil plays an important economic, social and environmental role (Karray *et al*, 2006). Recently, in Tunisia the production of olives and olive oil is increased and exports and consumption are growing steadily. (Fig. 4 and 5)

Fig.4 Production, consumption and export of olives in Tunisia (.000 ton)



Source: IOC, 2012

Fig.5 Production, consumption and export of olive oil in Tunisia (.000 ton)



Source: IOC, 2012

However, it is essential to adopt policies to increase the production and marketing of olive oil inside the country in order to support the farmers goals. Concerning the extra virgin olive oil market, after a lowering of production, consumption and exports in 2010/2011, there was a strong recovery in 2012.

4. EXTRA VIRGIN OLIVE OIL SUPPLY CHAIN IN ITALY: CASE STUDY

Each company within its specifications and functions, performs a number of activities, ranging from the supply of production factors, up to the marketing of products (Ghelfi, 2000; Salghetti e Ferri, 2006). The Italian olive oil sector is characterized by a pyramidal structure: we have a large agricultural production base, followed by a detailed phase-conversion, a small number of industries and a small group of buyers. In particular, the Centre of Italy is characterized by small farmers which realize the olives transformation process in their own structures or confer it to local mills located on the whole area. The olive oil production is not specialized, except for a few cases, but, it find its place in the market thanks to the connection with the territory and typical regional cultivars that differentiate the production with very popular varietal oil, oil PDO (Protected Designation of Origin) or different blends (Finco *et al.*, 2010). In fact, some authors highlight the benefits that short supply chain could bring to farmers, such as increased revenues, the stability of demand due to consumer loyalty, the ability to directly affect the price by reducing production costs (transportation and packaging costs above all) (Bigi, 2005; Cicatiello, 2008; Graziano, 2008; Aguglia et al., 2009). At the same time the producer can obtain a more adequate remuneration, taking back a portion of

the value which usually disperses in the various stages of the supply chain, and thus becoming price maker, rather than suffering the market price (Saccomandi, 1999). The study aimed to analyze the short chain of extra virgin olive in central Italy, with the specific goal of estimating and allocating costs within the supply chain, through the socio-structural and economic analysis. The economic analysis allowed us to identify the correct price of the product, in order to enhance local production and at the same time ensure a profit margin to the farmer.

4.1 Methodology

The methodology is based on farm cost analysis whose data were collected through questionnaires submitted to olive farms in the centre of Italy. The methodological approach adopted, analyzed farms' income statement and economic indicator of profitability (Gross and Net Income) in order to understand the real economic advantage to sell farm products in short supply chains (Bregoli, 1987; Salghetti and Ferri, 2006). The sample was chosen randomly among all the farms in Centre Italy members of the Olive Oil Association: it contains small farms without specialized olive production. The information collected (2009) describe the socio-structural aspects of the farms and the main economic activity. The 34 farms surveyed are divided into two categories based on the type of product sold: one group sells all or part of the olives harvested (23.5%) while the other transforms the olive in oil and then sells it (76.5%). The determination of olive production costs was carried out through the traditional methodology that is the analysis of farms income statement. The cost analysis examines two types of farms:

- 1) "farm producing and selling olives": in these case olive grove management cost and revenues deriving from olives sell to mills, are evaluated;
- 2) "farm production and selling olive oil": in these case costs and income assessments covers the whole life cycle of the products, from olives production to internal or external processing ending with oil direct sell (short supply chain).

From the income statement of each farm, were extrapolated total costs, given by the sum of variable costs and fixed costs: the former include pruning, fertilization, soil management, pest management and harvesting costs, while the latter include depreciation, taxes and interest on land and agricultural capital. In addition, for companies that sell oil the costs associated with processing in the mill and bottling have also considered (Di Cocco, 1970, De Benedictis and Cosentino, 1982). Fixed costs, deduced from observations of the data network FADN-RICA data (2007), affect 17.5% of the gross salable production (GSP) for companies selling olives and 20.6% for those selling olive oil in short supply chain.

4.2 Results

4.2.1 Socio-structural analysis

The survey allowed to outline the main characteristics of olive growing, considering the farm dimensions, the level of specialization and geographic location. The surveyed companies are distributed on the whole territory of Central Italy, for a total area of 99 hectares; the farms varies between 0.4 and 26 hectares, with 79 and 10,000 olive plants each. Dividing the sample into classes of farm land, it appears that 65% of farms fall within the class from 0 to 2 hectares, considered as family-owned farms, while only 12% are in the class from 5 to 30 hectares. The remaining part is located in the intermediate classes from 2 to 5 hectares (Table 2).

Tab.2 - Distribution of olive farms by surface classes

Class of farm land (ha)	n. farm	%
da 0 a 1	15	44%
da 1 a 2	7	21%
da 2 a 3	3	9%
da 3 a 5	5	15%
da 5 a 10	2	6%
da 10 a 30	2	6%
Tot	34	100%

The sample investigated reflects the national context which appears fragmented and not very specialize. The majority of the farms (88%) uses a mixed production strategy diversifying their activities in order to contrast risks and optimize opportunities under changing and adverse circumstances. The most common legal form of the farms is individual (88%) and only 12% of them are corporate. Regarding to farmers management, about 6% of the farms hire employees while the remaining 94% are conducted directly. In a conducted directly farms, mostly farmers employees family labor (75%). The householder is in most cases (85%) male gender, aged in half of the sample between 40 and 60 years old, followed by over 60 (28%) and the band below 40 years (22%). More than half of business hold (51%) a middle school diploma, 37% hold an high school diploma and only 12% are graduates. The 76.5% of the farm process the olives and trades olive oil 9% sell all the olives to the mill and the remaining 14.7% sell a part of the olives to the mill, and process the remainder. The average selling price of the olives is 53 €/ ton, varying from a minimum price of 42 €/ton to a maximum price of 70 €/ ton.

4.2.3 Economics analysis:

Olives production and sell

The estimation of olive grove production costs allowed to quantify the most expensive items of expenditure, to analyze the different types of management and in particular to determine the correct remuneration to achieve from the olives sale.

The most expensive items of expenditure are pruning and harvesting, that together represent about 90% of the total costs.

In the sample, the farms that sell olives (all of them or just a part) are 8 (23.5% of the total).

The average production costs are about 0.46 €/kg, in a range of 0.37 €/kg to a maximum of 0.57 €/kg.

In Tunisia some factors of production, in particular labor force and mechanization, are less expensive than those of Italia country; In fact, Tunisia olive production costs amount to approximately 0.12 €/kg for medium size farms (Karray *et al*, 2000)

In Italy, the average selling price is around 0.53 €/kg (in line with the wholesale price list) and the average gross income is 0.07 €/kg (Table 3): those low profits are consequence of high costs of cultivation.

Tab.3 - Average net income of farms sell olives, in €/kg

	Cost cultivation olives (€/kg)	Prices olive (€/kg)	Gross income (€/kg)	Fixed costs (€/kg)	Net income (€/kg)
Average farms	0.46	0.53	0.07	0.09	-0.02

The farm average net income per kilogram of olives is obtained from the difference between the gross income and fixed costs, accounted for 17.5% of the GSP (Gross Saleable

Production). Table three shows that the final average net income is negative, equal to -0.02 € / kg.

Olive oil production and sell

For olive oil production and sales all the stages of the supply chain were considered together. Production costs are the biggest share of the variable costs (average 69%), followed by processing costs (21% on average) and then bottling costs (10% on average) (Table 4).

The data show that larger farms (5 to 30 hectares) have lower costs of cultivation, because they are able to achieve economies of scale by increasing management and organizational skills. However, they have higher costs of bottling, due to both a better product differentiation in the packaging stage and the high amount of oil sold in bottles, compared to small businesses that sell primarily oil in cans.

Intermediate size class farms (2 to 5 hectares) have higher costs of cultivation, because in the sample, farms with family run-farms are predominant, leading to greater impact on the total operating costs than larger farms.

Tab. 4 - Variable unit cost for each phase of the supply chain, in €/liter

Class (ha)	Cultivation (€)	Transformation (€)	Bottling (€)	Total (€)
from 0 to 2	3.99	1.11	0.41	5.51
from 2 to 5	4.45	1.16	0.40	6.01
from 5 to 30	3.69	1.31	0.96	5.96
Total average	4.04	1.19	0.59	5.83

The average GSP of the farms in the sample changes with the amount of oil sold, increasing proportionally to farm size and selling price. Price differences mainly depend on strategies of product differentiation, including for example packaging, oil quality and flavored oils production.

The average net income per liter of oil is calculated as the difference between gross income and fixed costs, which account for 20.6% of the GSP in each class.

Table 5 shows how average total costs, obtained by the sum of variable costs and fixed costs, are 7.7 €/liter.

Tab. 5 - Average net income for liter of olive oils, data €/liters

Class (ha)	1 Variable costs (€)	2 Fixed costs (€)	(2 + 1) Total costs (€)	3 Price (€)	5 Gross income (€)	(5-2) Net income (€)
from 0 to 2	5.51	1.60	7.11	7.78	2.27	0.67
from 2 to 5	6.01	1.81	7.82	8.78	2.77	0.96
from 5 to 30	5.97	2.15	8.12	10.42	4.45	2.30
Total average	5.83	1.85	7.68	8.99	3.16	1.31

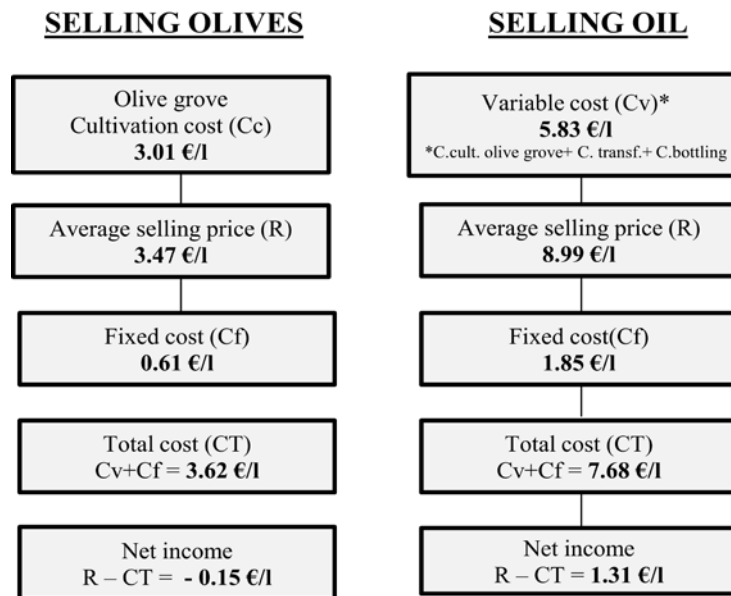
In conclusion, all the farms considered realize profits, with an average net income of approximately 1.3 €/liters, but larger size farms are the ones that get higher comings, because day are able to act as a price maker, resulting in a higher market price.

Supply chain cost analysis, using indicators of profitability, shows that the sale of oil instead of olives entails a substantial economic advantage. In fact, the consumer, in this case, recognizes the premium price for the food product.

Furthermore, from the comparison of profitability indicators between farmers selling raw material and farmers selling the processed product, it is demonstrated that selling the final

product to consumer in short food supply chain is potentially and more beneficial for producers (Figure 6)

Fig. 6 –Profitability in the short food supply chain (€/l): selling olives Vs selling olive oil



5.CONCLUSION AND DISCUSSION

The effects of food prices volatility and the financial and economic crisis impact the vulnerable agricultural production, causing a low profitability and high fragmentation. In this situation, it is very important to study new models of management, such as the alternative agro food networks-AFNs.

The research has highlighted the role that the short food supply chains can have on the agricultural sector in Italy, especially for extra-virgin olive oil householder farms. In the specific case study, survey results have shown that, in central Italy, there is a large number of small-medium size farms and that high production costs make difficult to ensure profitability only with selling olives. On the other hand, olive oil processing and direct sale in the medium-big size farm allow the acquisition of higher profit margins (Sargentoni *et al*, 2013).

The SFSCs from our point of view, could be an opportunity for small farmers' in the olive oil market especially in Tunisia, where small and medium-sized family farms dominate agriculture (Jouili M., 2009) and where the commercial policy gave a marked priority to olive oil exportation. In fact, strategic geographical position of Tunisia, the diversity of olive trees inheritance, the low production cost with regard to the main producing countries, the private operator implication in the collection and the exportation, the diversity of institutions and the importance of the tourism sector offers big possibilities to improve quality, signs of quality (Karray *et al*, 2000; Larby *et al*, 2009) and competitiveness of olive oil farms.

In this context, policy makers need to set up land programs in order to avoid parcelling and bring together small farmers in a cooperative system (Dehehibi *et al*, 2006). However, the concentration of plantations in the arid and semi-arid regions, the weak proportion of the irrigated olive tree area, the low productivity of plantations, the absence of horizontal and vertical integration in a market, the Tunisian export concentration on the European market and the absence of long- term strategy does not favor the most of the increase in oil

marketing than in the export product.

As future research implications, it is important to undertake experimental investigate on the implementation of short food supply chain in Tunisian olive-oil market.

The application of alternative food network generate also a public benefits, that include economic development impacts, health and nutrition benefits, impacts on food security, and effects on energy use and greenhouse gas emissions (Edwards-Jones et al., 2008; Peters et al., 2008; Martinez et al., 2010).

Nowadays, in fact it is important to assess not only the economic sustainability of farm, but also the environmental and socio-territorial sustainability (Elfkiah *et al.*, 2012).

References

- Abate G., (2008), "Local Food Economies: Driving Forces, Challenges, and Future Prospects", *Journal of Hunger & Environmental Nutrition*, vol. 3(4), pp. 384-399.
- Aguglia L., Santis F.D., Salvioni C. (2009), "Direct Selling: a Marketing Strategy to Shorten Distances between Production and Consumption". Paper presented to 113th seminario EAAE: "A resilient European food industry and food chain in a challenging world", Chania, Crete, Greece, 3 - 6 Settembre 2009.
- Allen, P., FitzSimmons, M., Goodman, M., Warner, K., (2003), "Shifting plates in the agrifood landscape: the tectonics of alternative agrifood initiatives in California", *Journal of Rural Studies*, vol. 19 (1), pp. 61-75.
- Bigi, M. (2005), "Dal produttore al consumatore. La filiera corta. Opportunità per lo sviluppo delle razze italiane da carne". 4th World Italian Beef Cattle Congress, Italy, 29 Aprile - 1 Maggio.
- Bregoli A. (1987), *Bilancio e contabilità nell'azienda agraria*, Padova, Liviana, pp.11.
- Brown, A., (2002), "Farmers' market research 1940-2000: An inventory and review", *American Journal of Alternative Agriculture*, vol. 17(4), pp. 167-176.
- Brown, C. e Miller, S., (2008), "The Impacts of Local Markets: A Review of Research on Farmers Markets and Community Supported Agriculture (CSA)", *American Journal of Agricultural Economics*, vol. 90(5), pp. 1296-1302.
- Brunori G., Malandrin V., Rossi A., (2012a), "Trade-off or convergence? The role of food security in the evolution of food discourse in Italy", in *Journal of Rural Studies*.
- Brunori G., Rossi A., Guidi F., (2012b), "On the New Social Relations around and beyond Food. Analysing Consumers' Role and Action in Gruppi di Acquisto Solidale (Solidarity Purchasing Groups)", *Sociologia Ruralis*, Vol 52, Number 1.
- Calori, A. (2009), Coltivare la città, in Calori A. (a cura di), *Coltivare la città. Giro del mondo in dieci progetti di filiera corta*, Milano, Altra Economia, pp. 10-47.
- Carbone A., Gaito M. E Senni, S. (2007), Consumers' Buying Groups in the Short Food Chains: Alternatives for Trust, paper presentato al 1st International European Forum on: "Innovation and System Dynamics in Food Networks", EAAE, Innsbruck-Igls, 15-17 Febbraio.
- Cicatiello C. (2008), "La vendita diretta dei prodotti agricoli: un'analisi della situazione locale". *Tuscia Economica*, n.1.
- De Benedictis M., Cosentino V. (1982), "Economia dell'azienda agraria". Bologna, Il Mulino.

- Dhehibi B., Lachaal L., Karray B., Chebil A.(2006), “*Decomposition of output growth in the Tunisian olive-growing sector: A frontier production function approach*”. Paper prepared for presentation at 98th EAAE seminar: “Marketing dynamics within the global trading system: new perspectives”, Chania, Crete, Greece, 29 June - 2 Settembre 2006.
- Di Cocco E. (1970), “*Elementi di economia agraria*”. Bologna, Ed. Agricole.
- Edwards-Jones G., Milà L. i Canals, Hounsome N., Truninger M., Koerber G., Hounsome, B., Cross P., York E.H. Hospido A., Plassmann K., Harris I.M., Edwards R.T., Day G.A.S., Tomos A.D., Cowell S.J., Jones D.L. (2008), “*Testing the assertion that ‘local food is best’: the challenges of an evidence-based approach*”. Trends in Food Science & Technology, 19(5), pp. 265-274.
- Elfkih S., Guidara I., Mtimet N.(2012),”*Are Tunisian organic olive growing farms sustainable? An adapted IDEA approach analysis*”. Spanish Journal of Agricultural Research 2012 10(4), 877-889.
- Fritz, M., Martino, G. (2009), “Short Food Supply Networks: Expectations, Experiences, Trust in the Case of Farmers Markets”, in Fritz M., Rickert U., Schiefer G., (a cura di), on the 3rd International European Forum on: “*System Dynamics and Innovation in Food Network*”, endorsed by the EAAE, Innsbruck-Igls, Austria, 16-20 Febbraio, pp. 409-422.
- Jouili M. (2009), “*Tunisian agriculture: Are small farms doomed to disappear?*”. Paper presented at 111 EAAE-IAAE Seminar ‘Small Farms: decline or persistence’, University of Kent, Canterbury, UK 26th-27th June 2009.
- Larbi W., Chymes A. (2009), “*The impact of the government policies and incentives to promote the export of agricultural products in Tunisia: case of olive oil*”. Paper prepared for presentation at the 113th EAAE Seminar “A resilient European food industry and food chain in a challenging world”, Chania, Crete, Greece, date as in: September 3 - 6, 2009.
- Finco A., Sargentoni T., Padella M. (2010), “*L’Olio Extravergine tra Valore e Territorio - Un’indagine nella provincia di Ancona*”, Ancona, Coldiretti – A.S.P.eA (Azienda Speciale Pesca Agricoltura della Camera di Commercio di Ancona).
- Ghelfi, R. (2000), “*Evoluzione delle metodologie di analisi dei costi aziendali in relazione alle innovazioni tecniche ed organizzative*”. In atti del XXXVII Convegno di studi SIDEA, 14-16 settembre, Bologna, pp.407.
- Graziano P. (2008), “*I mercati contadini e la gestione della qualità dei prodotti alimentari*”. In atti XXIX Conferenza Italiana di Scienze Regionali AISRE: Università Cattolica del Sacro Cuore, 24-26 settembre, Piacenza.
- Guidi, F. (2009), *Filiera corta: percorsi di innovazione tecnici, organizzativi e sociali nella gestione strategica delle nicchie. Esperienze in Toscana e Provenza*, Final PhD dissertation, Università di Bologna, Italy.
- Hinrichs C.C. (2000), “Embeddedness and local food systems: notes on two types of direct agricultural market”, *Journal of Rural Studies*, n.16, pp. 295-303.
- Hinrichs, C.C. (2003), “The practice and politics of food system localization”, *Journal of Rural Studies*, vol. 19, pp. 33-45.
- Holloway L., Kneafsey M. (2000), “Reading the space of the farmers’ market: a preliminary

- investigation from the UK”, *Sociologia Ruralis*, vol. 40, pp. 285–299.
- International Olive Council (IOC), (2012). <http://www.internationaloliveoil.org/>.
- Ilbery, B., Maye, D., (2005), “Alternative (shorter) food supply chains and specialist livestock products in the Scottish-English borders”, *Environment and Planning*, 37, pp. 823-844.
- Karray, Boubaker (2006), “*Olive Oil World Market Dynamics and Policy Reforms: Implication for Tunisia*”. Paper presented at the 98th Seminar of the EAAE, Chania, July.
- Karray B., Louizi A., Sahnoun A. (2000), “*Estimate of the production cost of oil olives in Tunisia application of the ascertained costs method to private farms in the Sfax region*”. *Medit* 2000 Vol. 11 No. 4 pp. 11-17.
- Kirwan, J. (2004), “Alternative strategies in the UK agro-food system: Interrogating the alterity of farmers’ markets”, *Sociologia Ruralis*, vol. 44(4), pp. 395-415.
- Malassis L., Ghersi G. (1995), *Introduzione all’Economia Agroalimentare*, Il Mulino, Bologna.
- Mariani, A., Taglioni, C., Torquati, B. and Viganò, E. (2011), “Alternative Food Networks e sviluppo locale sostenibile: riflessioni sui Gruppi Organizzati di Domanda e Offerta”, *Economia & Diritto Agroalimentare*, XVI, n.2, pp. 263-281.
- Marsden T. K., Banks J., Bristow G., (2000), “Food supply chain approaches: exploring their role in rural development”, *Sociologia Ruralis*, vol. 40, pp. 424-438.
- Marsden T., Smith E., (2004) “*Ecological entrepreneurship: sustainable development in local communities through quality food production and local branding*” . *Geoforum* 36 (2005) 440–451.
- Martinez S., Hand M., Pra M. D., Pollack S., Ralston K., Smith T., Vogel S., Clark S., Lohr L., Low S., Newman C. (2010), “*Local Food Systems: Concepts, Impacts, and Issues*”. ERR 97, U.S. Department of Agriculture, Economic Research Service, May 2010.
- Mount, P. (2012), “Growing local food: scale and local food systems governance”, *Agriculture and Human Values*, vol. 29(1), pp. 107-121.
- Murdoch J., Marsden T. e Banks J. (2000), “Quality, nature, and embeddedness: some theoretical considerations in the context of the food sector”, *Economic Geography*, vol. 76, pp. 107-125.
- Pascucci, S., Cicatiello, C., Franco, S., Pancino, B., · Davide, M., (2011) "Back to the Future? Understanding Change in Food Habits of Farmers' Market Customers", *International Food and Agribusiness Management Review*, Volume 14, Issue 4, pp.105-126.
- Peters C.J., Bills N.L., Wilkins J.L., Fick G.W., (2008), “*Foodshed Analysis and Its Relevance to Sustainability*”. *Renewable Agriculture and Food Systems*, Vol. 24, pp. 1-7.
- Renting H., Marsden T.K., Banks J. (2003), “Understanding Alternative Food Networks: Exploring the Role of Short Food Supply Chains in Rural Development”, *Environment and Planning A*, vol. 35, pp. 393-411.
- Rossi, A., Brunori, G., Guidi, F., (2008), “I mercati contadini: un’esperienza di innovazione di fronte ai dilemmi della crescita”, *Rivista di diritto alimentare*, vol.3.

- Salghetti A., Ferri G. (2005), “*Metodologia di calcolo del costo di produzione del latte e analisi applicativa su allevamenti convenzionali e biologici*”. Annali della Facoltà di Medicina Veterinaria, Università di Parma, Vol. XXV, pp. 247-268.
- Saccomandi V. (1999), “*Economia dei mercati agricoli*”. Il Mulino, Bologna.
- Sanderson, K., Gertler, M., Martz, D., Mahabir, R., (2005), Farmers’ Markets in North America: A Literature Review, *Community-University Institute for Social Research University of Saskatchewan*, Canada.
- Sargentoni T., Tramontano A., Finco A., (2013), “*Sostenibilità economica della filiera corta dell’olio di oliva extravergine - Profitability and cost analysis of short food supply chains: the case of extra virgin olive oil in Marche Region*”, Rivista di Economia e Diritto Agroalimentare. Vol.1/2013.
- Scrinis G. (2007), “From techno-corporate food to alternative agri-food movements”, *Local-Global*, vol. 4, pp. 112-140.
- Stopes, C., C. Couzens, Redman M., Watson, R., (2007), “Local food. The case for re-localising Northern Ireland's food economy”, *Friends of the Earth*.
- Tregear, A. (2011), “Progressing knowledge in alternative and local food networks: Critical reflections and a research agenda”, *Journal of Rural Studies*, vol. 27(4), pp. 419-430.
- Venn, L., Kneafsey, M., Holloway, L., Cox, R., Dowler, E., Tuomainen, H. (2006), “Researching European ‘alternative’ food networks: some methodological considerations”, *Area*, vol. 38, n.3, pp. 248-258.