

The Tunisian wheat sector in the new liberalization scenario

ROBERTO LA ROVERE*, CHOKRI THABET**, KARIM AMMAR*, RAHMA SFERI*

Jel classification: Q130, Q180, L660

1. Introduction

In the past two decades, many countries in the Mediterranean region have reformed their agricultural sector by lowering agricultural tariffs, liberalizing domestic prices and reducing consumer food subsidies. However, trade restrictions and domestic price support mechanisms are still prevalent for commodities such as wheat, and countries widely differ in terms of the extent and depth of liberalization. Under the Euro-Mediterranean Partnership launched in 1995, ongoing and future bilateral free trade agreements between the European Union and North African countries are likely to lead to further trade liberalization. Previous and ongoing domestic agricultural reform, bilateral and regional trade agreements and future trade liberalization that may result from further multilateral trade negotiations under the World Trade Organization (WTO) may affect the agricultural sector in the Mediterranean region.

Most poor farmers and consumers in these countries depend on risky and complex wheat-based farming systems for their livelihoods and caloric intake. To assess trade lib-

Abstract

This study explores the likely effects of trade liberalization on the wheat value chain in Tunisia. The objectives are to: i) generate quantitative and qualitative information on the performance of wheat producers and the main constraints they face; ii) describe the institutional organisation of the Tunisian wheat value chain; iii) describe and examine the most important stakeholders in the cereal production chain: people in charge of the collection and storage, milling industry managers and pasta and couscous manufacturers; iv) describe and analyze the cereal policy implemented by the Tunisian government; and v) assess the possible impacts of multilateral trade liberalization on the wheat value chain and staple food affordability and livelihoods in rural and urban areas. The results of the analysis suggest that a multilateral trade liberalization represented by an increase in international wheat prices would be beneficial to Tunisian wheat growers. However, in order to take advantage of these changes, an institutional reform in the wheat value chain should be introduced. The Tunisian government has to redefine the role of the Cereal Office which has the legal monopoly on cereals collection, imports and distribution intended for human and animal consumption.

Keywords: wheat sector, Tunisia, market, institutional organisation.

Résumé

Cette étude explore les possibles effets de la libéralisation des échanges commerciaux sur la chaîne de valeur du blé en Tunisie. Les objectifs sont: i) fournir des informations quantitatives et qualitatives sur la performance des céréaliculteurs et les problèmes principaux qu'ils doivent résoudre; ii) décrire l'organisation institutionnelle de la chaîne de valeur du blé en Tunisie; iii) décrire et examiner les acteurs les plus importants de la filière des céréales: responsables de la récolte et conservation, chefs de la minoterie et producteurs de pâtes et couscous; iv) décrire et analyser la politique céréalière réalisée par le gouvernement tunisien; et v) évaluer les possibles répercussions sur la chaîne de valeur du blé, l'accessibilité aux aliments de base et sur l'autosuffisance alimentaire dans les zones urbaines et rurales. Les résultats de l'analyse suggèrent qu'une libéralisation commerciale multilatérale, représentée par la hausse des prix du blé sur le marché international, pourrait favoriser les producteurs de blé de la Tunisie. Quoiqu'il en soit, pour profiter de ces changements, il s'avère nécessaire de réaliser une réforme institutionnelle de la chaîne de valeur du blé. Le gouvernement tunisien se doit de redéfinir le rôle de l'Office des Céréales qui détient le monopole légal de la récolte, importation et distribution des céréales destinées à la consommation humaine et animale.

Mots clés: secteur céréalier, Tunisie, marché, organisation institutionnelle.

eralization impacts on the livelihoods of wheat producers and consumers, we look at the impacts along the wheat value chain, including the trade institutions providing to final consumer services.

For this study, Tunisia was chosen as a pilot country to examine the impact of liberalization on the national wheat production industry. Tunisia is committed to an economic liberalization process leading to a gradual integration in the global economy (UNDP, 2004). Tunisia acceded to the General Agreement on Tariffs and Trade (GATT) in 1990 and has been a member of the World Trade Organization since 1995. In 1996, it signed a Free Trade Agreement with the European Union (EU). An objective of this agreement was the opening of the Tunisian market to foreign competition and the elimination of government protection for Tunisian producers. This agreement has been implemented in 2008 for all industrial

products. Yet, trade in agricultural and food products is still not covered by this agreement. Current bilateral negotiations between Tunisia and the EU want to liberalize agricultural trade in conjunction with progresses at multilateral negotiations within the WTO.

The liberalization of trade in manufactured goods between Tunisia and its main trade partners (EU, Arab countries,

* CIMMYT, International Maize and Wheat Improvement Centre

** Département d'économie et de développement rural, Institut Supérieur Agronomique de Chott Mériem, Sousse, Tunisia.

Turkey, EFTA, etc.) observed over the last decade increases the relative protection of the agricultural sector compared to the rest of the economy. On the one hand, this alters the balance of resource allocation within the Tunisian economy and reduces the level of expected gains from liberalization. For these reasons, agricultural and food trade liberalization is currently of high concern for the Tunisian public authorities. On the other hand, protecting the cereal sector, albeit not being a sustainable solution, and being farmers' competitiveness crucial, if wisely used is a functioning measure in terms of food security, political sovereignty and development policy, by providing to emerging farmers with a chance to be able to compete.

This study addresses five objectives:

- Generating quantitative and qualitative information on the performance of wheat producers and the main constraints they face;
- Describing the institutional organization of the wheat value chain;
- Describing and examining the most important players in the Tunisian cereal chain: collection and storage, milling industry and pasta and couscous manufacturers;
- Describing and analyzing the cereal policy implemented by the Tunisian government;
- Assessing impacts attributable to multilateral trade liberalization on the wheat value chain, in terms of staple food affordability and livelihoods in rural and urban areas.

This study addresses wheat value chain issues in relation to trade liberalization. As a basis for doing so, Section 2 explains the main elements of data and methods used for the review and analysis. Section 3 describes the main results of a farmer's survey, to understand the functioning of the cereal chain in terms of production, constraints and technical and economic performance within the context of the institutional organization of the system. Section 4 discusses the position of the Tunisian milling and pasta industries within the context of liberalization, in relation to the European one, by touching aspects of cereal and pricing policy, trade and subsidies, based on the results of the survey and on the literature that was reviewed.

Section 5 concludes by discussing the likely impacts on different actors in the value chain and on the livelihoods of rural and urban households, especially in terms of the likely effects on poverty, of reducing the barriers to trade on cereal products following trade liberalization.

2. Materials and methods

On the basis of the relative importance of cereal activity by region, our study focused on two governorates located in the North of Tunisia: Béja and Siliana. The latter contributes up to 32% of the total cereal production in the country. Due to their suitable geographic location (North) and climate, these governorates are traditionally important in cereal production. Durum wheat is the most important cereal in economic terms and for the prices it fetches, in rural areas as

well as for urban consumption. Bread wheat, introduced during the French colonial time, has been losing ground to durum wheat as main cereal after the independence.

A survey was conducted on a random sample of 44 farmers (22 from each governorate). Single visits to farmers took place in 2006 to solicit answers to a structured questionnaire covering qualitative and quantitative information about the farming system. The questionnaire covered farmers social characteristics, land characteristics and tenure, farm structure, land use the main production factors, production system, yields and intensity of variable factors use (fertilizers, water, seeds, chemicals weed controls etc.). It also included open questions to broadly understand the main problems that are faced by farmers as well as their opportunities. The study analyzed 18 processing companies, i.e. 15 exclusively in the milling business and 3 only-pasta producers. Surveyed mills were in the governorates of Ben Arous, Gabes, Sfax, Sousse and Tunis (2 companies each), Ariana, Béja, Gafsa, Manouba and Kairouan.

3. Results

3.1. Descriptive results

About 20% of surveyed farmers owned less than 20 ha, 50% of them less than 100 ha and only 30% more than 100 ha. The average age of farmers was 52 years. About 41% of surveyed farmers had primary and secondary education levels, 32% university level, and the rest had no formal school education. These characteristics play a role in technology adoption behaviour, with the younger and more educated farmers more likely to adopt new technologies. In Tunisia, land fragmentation and absenteeism are a source of concern. Holdings of less than 5 ha have risen from 41% to 53% of total land area since 1976. The Agence Foncière Agricole (AFA) has been reconsolidating and titling (mostly irrigated) land at a rate of 12,000-14,000 ha per year. For the surveyed farmers, the total agricultural surface average (TAS) was estimated at 94.4 ha (maximum 550 ha / minimum 4 ha). About 62 % of the TAS is cultivated by the owners, 37% rented, and only 1% sharecropped. The cultivated agricultural land accounted for 94% of TAS on average. Cereals are the dominant crops in the study areas. They occupy 61% of the usable agricultural surface (UAS) on average. They are distributed between durum wheat 47%, bread wheat 6% and barley 8%. On average, vegetables and forage areas account for 12% and 11% of the UAS, respectively. Triennial rotations are predominant, practiced by 55% of farmers. The durum wheat or bread wheat -forage/barley-food legumes rotation is most practiced in rainfed conditions and the durum wheat or bread wheat – forage/barley – vegetables/food legumes rotation is prevalent under irrigated conditions. Irrigated area accounts for 35% of the total UAS. About 73% of surveyed farmers practice supplemental irrigation on cereal crops. Durum wheat is the main cereal crop using supplemental irrigation. Five varieties of durum wheat are

grown in Tunisia, all semi-dwarf types. The most common and widely adapted is *Karim 80*, sown on more than 50% of durum wheat surface area country-wide; then comes *Khlar* with 20% and, to a lesser extent *Razak*, *Oum Rabei* and recently *Nasr*. Ninety percent of the seed used in irrigated areas is certified whereas only 70% is certified under rainfed conditions. Also, since the most practiced wheat in our farmer's samples as well as in Béja and Siliana governorates is durum wheat, we focus in the rest of this paper on the technical and economic performances of this crop.

3.2. Technical and economic performance of durum wheat

Average durum wheat yields are estimated at 37 ql/ha. They vary from 42 ql/ha under irrigated conditions to 26 ql/ha under rainfed conditions. These results are higher than the national average but they are in line with the two regions' averages. The average grain production value of durum wheat in rainfed conditions is estimated at 925 Tunisian Dinars (TND)/ha whereas it is higher than 1500 TND in irrigated conditions. The highest production value is from irrigated durum wheat (2111 TND /ha), the lowest is 235 TND /ha in rainfed conditions.

Irrigated durum wheat variable costs are on average 780 TND/ha against 400 TND/ha in rainfed conditions. These show important variability in terms of gross margins. In irrigated conditions the gross margin per ha is on average 1468 TND and about 1225 TND in rainfed conditions. Furthermore, 30% of surveyed farmers had negative gross margins in rainfed conditions; hence they are unable to cover fixed costs related to capital depreciation, permanent labour etc. Only 10% of the irrigated farms have obtained negative gross margins.

The most vulnerable farm types to agricultural trade liberalization may be those with low gross margins. Yet these results refer only to year 2005-2006, which was not a very good year in terms of distribution and amount of rainfall, which was below average by 80 and 190 mm respectively in Béja and Siliana, yet they give an idea on the performance of cereal growers.

Nitrogen fertilizer involve a considerable share of cereal production costs; on average, 62.5% of fertilization costs, 13 % of variable costs, 7% of production costs. In irrigated conditions, the water cost for durum wheat production accounts respectively for 27% and 17% of variable and total production costs. Labour costs vary on average from 10% and 15% of total costs in rainfed and irrigated land, which means that cereal cropping is not labour intensive in Tunisia.

3.3. Main constraints

The results of the survey show that the grain yields are low despite of the high potential of the cultivated varieties. The constraints can be summarized as follows:

- Most varieties are susceptible to fungal diseases that, in

wet years when yields should be high, do not allow the expression of the genetic yield potential of these varieties,

- Scarce extension activities since few visits are made by Ministry of Agriculture agents to advise and supervise the crop management activities. Furthermore, a common problem of extension in Tunisia is related to the fact that extension agents have multidisciplinary profiles and are not specialized in wheat production (Khaldi, 2003 and Sghaier, 2004).

- Increase in input prices that are no longer subsidized, e.g. fertilizers, phytosanitary products, seeds (only irrigation water is subsidized but its price needs to be progressively adjusted).

- Low producer prices, fixed by the Office des Céréales (OC).

3.4 Institutional organization of the Tunisian cereal chain

The institutional framework plays an essential role in economic development and has impact on agricultural performance. The government can influence the contribution of agriculture to development. By using monetary and tax instruments as well as price intervention, the government can capture part of the agricultural surplus and act on the performance of the agricultural sector.

Cereal pricing policy often derives from negotiation between groups of interest. Four interest groups can be distinguished in the Tunisian cereal chain: (i) policy decision makers, (ii) farmers, (iii) millers and pasta producers, and (iv) the consumers:

(i) **Policy decision makers:** Three ministries are involved in the control of the policies at the cereal chain level and each one has its specific interests:

- The Ministry of trade and handicrafts ensures an adequate supply level of flour and semolina for all the country. It lays down the commercialization methods and intervenes in the determination of flour and semolina prices.

- The Ministry of Agriculture and Hydraulic Resources outlines the general policy of the cereal sector and supervises the activities of the OC.

- The Ministry of Finances is in charge of maintaining the government's expenditures to a given threshold level. It manages the General Compensation fund (Caisse Générale de compensation – CGC) and ensures the refund of the OC for the difference between production and distribution price. Other public institutions also involved are:

- The OC: it has the legal monopoly on collection, imports and cereals distribution intended for human and animal consumption. Its main mission consists in supplying the country with cereals and regulating the market using the local production or imports if needed. Moreover, it plays an interface role between producers, millers and the CGC.

The OC ensures, with the aid of the Cooperatives Centrales and private collectors, the purchase, sale, distribution and storage of approximately 800 thousand tons of cereals per year, 50% of the total production.

- The CGC is a public institution having the task of managing subsidies. Created by the Tunisian government in 1970, it ensures stability of consumer prices for the goods considered of first necessity, ensures to farmers and other intermediates in the cereal chain an acceptable remuneration allowing them to improve their productivity and increase their production, and controls the expenditures related to managing the system.

(ii) **Farmers:** Cereal producers can be classified into three groups based on the size of their farming operation; small, middle and large farmers. According to the last structural survey of 2005 by the Ministry of Agriculture, 54% of farms are less than 5 ha and hold 11% of agricultural surfaces. The proportion of farms having less than 10 ha goes up to 75% of the total number of farms and cover 25% of the total surface. The farms whose surface exceeds 50 ha account for only 3% and own more than 34% of the agricultural surface.

(iii) **Millers:** millers occupy a strategic position in the value chain. They purchase cereals from the OC and transform the bread wheat into flour for bakery (PS) at an extraction rate of 78%, pastry cook flour (PS-7) at a rate of 71%, and durum wheat into semolina (PS-10) at a rate of 67%. Millers and pasta producers are organized in the chamber of millers syndicate. Milling is a branch of cereal industries, contributing 8% of food and farming production of turnover.

(iv) **Consumers:** Cereals provide 54% of the calorie intake and 64% of the protein intake of a Tunisian. Annual per capita consumption is about 181 kg, 51% of durum wheat and 41% bread wheat. Cereals make up 16% of food consumption and 6% of total annual spending. Maximum consumption is expected to peak at 1.8 million tons in 2010, and then to decline.

3.5. Description of the cereal chain

Figure 1 explains the organization of the cereal chain. Cereal collection is regulated by defining the commercial relations between collectors and producers. The OC, with assistance by its agents (Cooperatives Centrals and some private collectors), ensures the purchase, transfer and storage of about 8 million ql per year, which represents about 50% of the total national production. The share of the OC collection has declined from 60% during the 1990s to about 40% in recent years, partly as a result of national policies in favour of disengaging the government from commercial competitive activities. However, the amount of cereals collected from farmers remains small, on average about 8 million ql in the last decade, including 5.89 million ql of

durum wheat and 1.55 of bread wheat (Table 1 below).

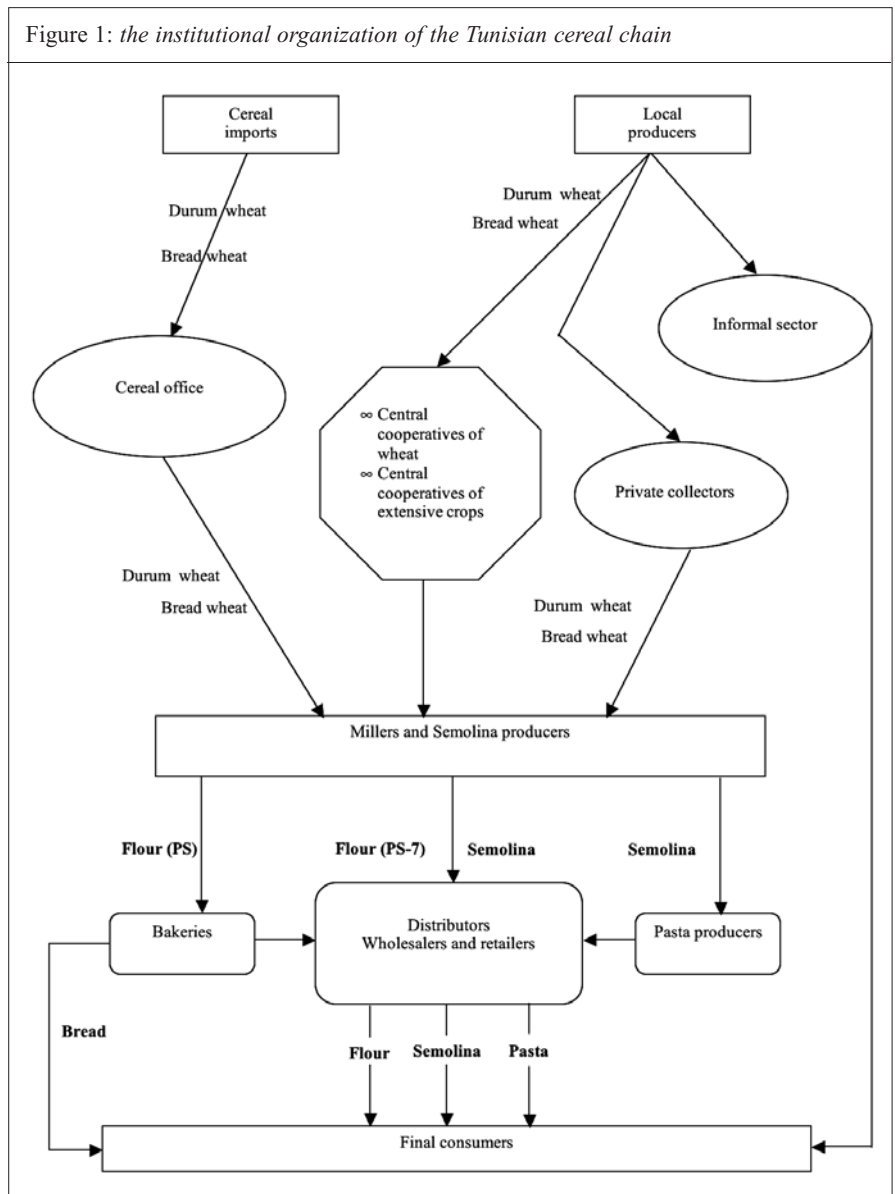
The quantities collected vary from year to year and are not correlated with production.

This is due partly to undetermined consumption of farmers and to the existence of a parallel market that keeps absorbing about a third of the country's cereal production.

This market is perpetuated due to the bureaucracy involved in selling grain to the OC and the better prices offered by this market to cereal farmers (World Bank, 2006). In the controlled market, producers deliver their crop through collection centres to storage units that also receive imported cereals. The stocks held by these units correspond to, on average, 2 – 3 months of consumption (MARH, 2005).

The country's storage capacity is over 13.5 million ql, divided almost in half between the government and the private sector, more than 80% located in the North of the country. It is the OC that intervenes directly or through cooperatives to

Figure 1: *the institutional organization of the Tunisian cereal chain*



ensure collection and storage.

There are two main cooperatives involved: the *Cooperative Centrale du Blé* (COCEBLE) and the *Coopérative Centrale des Grandes Cultures* (CCGC). The OC ensures 46% of collection while the CCGC and COCEBLE ensure what remains at rates of 27% and 20% respectively. The rest is collected by small cooperatives and operators (MARH, 2006). Small quantities of grain transit through the storage facilities of the OC because most of the grains are delivered directly to flour and semolina mills. After this first transformation, flour and semolina can follow one of four itineraries: 1) wholesale distributors who supply bakeries and retailers, 2) retail distributors who supply the consumer, directly, 3) bakers who supply wholesalers, retailers and consumers with baked goods, and 4) factories of food industries.

This sector faces a number of problems:

- The infrastructure is old, some of which was created before the independence.
- Absence of financial resources and investment programs which may have led some to deficit situations.
- Inadequate accounting systems that confound centres, functions and products.
- Limited coordination that leads to a poor use of infrastructure and competition among the operators.
- Insufficient reception and outflow preventing optimum use of collection silos
- Loss of about 8 to 10% of the total quantities collected during transport, handling and storage (OC, 2003; MARH, 2005; MARH, 2006, Khaldi, 1984)).

Processing activities in Tunisia are performed by 28 companies, 7 more than the 21 that existed ten years ago: 21 mills that process durum wheat (19 are mixed mills, processing both durum and bread wheat, 2 are for durum wheat only), 7

are used exclusively for bread wheat milling. Of these, 20 mills are located close to Tunis 3 most important areas, constituting 4 production hubs, 10 companies having plants in Tunis, guaranteeing 53% of transformation capacity; and 8 companies located in the Tunisia inland (MARH, 2006).

The Tunisian milling sector has a potential transformation capacity of 1,100 tons day or 3.3 million tons/year. In practice, it transforms a little more than 1.9 million tons of grain annually, 49% of which is durum wheat. Milling companies have been relatively quick to adhere to the government's national upgrade program for Small and Medium companies. The upgrade of equipment and management has made constant progress; most old companies have carried out upgrade programs. Eleven upgrade programs for milling companies have been approved between 1996 and 2002, to renovate the production tools with the objective of reducing costs, ensuring quality, hygiene and sanitary security. There is also a component for improving the competence and organisation of the companies. The total manpower employed by this industry is currently about 2000 people, unchanged since 1995. In light of the increase in production in 2002 compared to 1995, employment has regressed mainly because of modernization and automation. With more cutting down of handling, and once disposable packaging is fully adopted, employment will shrink even more as most jobs are in the cleaning and repair of reusable packaging, and handling (MIE, 2004).

The approach to enhance quality in Tunisia is still in its infancy. According to the interviewed millers, some clients, including bakers, are not quality-demanding, usually caring more about price than quality, while quality concerns are usually related to sanitary aspects rather than functional industrial quality attributes. The pasta and couscous makers

Table 1. *Collection and storage capacity in Tunisia¹*

Unity: Quintals (ql)							
	Storage capacity				Temporary collection and storage capacities		
	Harbour	Transit/withdrawal	Storage	Total	Collection	Temporary storage	Total
Office des cereals	900000	-	1200000	2100000	1400000	1800000	3200000
CCGC	-	150000	1300000	1450000	300000	600000	900000
COCEBLE	-	450000	600000	1050000	200000	400000	600000
COSEM	-	-	-	-	75000	100000	175000
CCSPS	-	-	-	-	75000	100000	175000
Industrials (Millers)	-	-	1000000	1000000	-	900000	900000
Other private	-	-	-	-	1650000	500000	2150000
Total	900000	600000	4100000	5600000	3700000	4400000	8100000

Source: MARH, 2006

¹ As our survey was not intended to be exhaustive, we preferred to integrate it with data of MARH, of which it represents a validation.

are however more quality-conscious and some milling companies are expressing their intention to improve and formalise the process. However, they are confronted with problems of availability of high quality grains as they have to rely exclusively on the OC for their raw material supply. For these reasons the global quality perspective, which would imply better control of supply, is still difficult to implement, unless the sector is allowed to import sufficient quantities of high quality grain (either directly or through the OC based on industry-approved quality requirements) or if high quality grain becomes available from local production.

The Tunisian pasta and couscous industry has seen big improvements in productivity and processing technology, brought about by the introduction of high drying temperatures (80/95°C). This technology, introduced in most units in the country, has the advantage of allowing the production of acceptable quality pasta even from average quality semolina.

For the pasta and couscous processing industry, the Tunisian statistical system records 25 units, 17 of which are active, 11 of 17 are producers of pasta, 3 of couscous and 3 produce both. Five of them are integrated into semolina factories and provide 80% and 50% of pasta and couscous production respectively. The entire production capacity represents 160,000 tons of pasta and 100,000 tons of couscous. The processing industry is subject to the control of departments related to the Ministry of Industry, Ministry of Agriculture and Hydraulic Resources, Ministry of Trade and Ministry of Finance. Furthermore, the sector is linked as an organism by financial, commercial and organizational relations with the OC who has the monopoly of cereal trading. Taking into account all these relations, it is evident that the milling sector goes through hardships that are inevitably reflected in the product's final quality.

Only 4 processing companies are of recent establishment, as they initiated their activities in the last 10 years, 5 started processing in the 1980s and early 1990s, 6 are more than 30 years old (some are close to 100 years old). In spite of their often old infrastructures, their potential capacities are between medium and high. The number of pasta producers surveyed was 3, two of them attached to a milling plant. Pasta makers are most often located in northern and central Tunisia in the Tunis, Sousse and Sfax governorates. These are productive units operating for decades in the pasta – making sector, operating under the legal status of (*Société à responsabilité limitée* or *Société Anonyme*) *Limited Liability Company*. Most production units and particularly the main units are equipped with the last generation pasta making machines. In terms of infrastructure, the industrial plants were constructed in the end of the 1970s and 1990s, with concrete and pre-manufactured metal structures. The average unit is about 48,000 m², of which 28,000 m² is roofed area and the rest is outdoor area used for logistics. Pasta-making factories production lines in the factory (starting with semolina up to spaghetti or couscous) range from 2 – 9 and produce on average 53,000-76,000 ton pasta and couscous. The high prod-

uct volumes are obtained thanks to the high potential of work plants, but also to high labour use, including more than 300 staff among operators, employees and managers. They guarantee workers contracts at stable cost due to the fact that salaries are relatively low. Durum wheat storage capacity is considered sufficient and holds an average of 18,000 tons of grain and 6,000 tons of semolina. More than half of the companies studied own more than 2 milling plants. Many companies, in addition to processing durum wheat, also mill bread wheat grain for bread-making. Work capacity is 20 tons/hour and in some cases higher than 42 tons/hour of processed product. This relatively high processing potential allows the companies to produce an average exceeding 23,000 tons of durum wheat semolina, 32,000 tons bread wheat flour, and 14,000 tons of bran per company per year. Couscous production is estimated on average at more than 2,800 tons per company, per year. Most mills are mixed, transforming both durum wheat and bread wheat grain. Their income ranges from 1.5 million TND to 40 million TND, with an average exceeding 18 million TND. A great part of product is for the domestic market. Most of it is locally consumed with up to 57% consumed in the same governorate and 43% outside. In terms of product destination, more than 68% of pasta and couscous goes to the domestic market and 32% is exported, mainly to African countries (Libya, Algeria, and West African countries). Exports management is responsible for the temporary admission of raw material and issuing letters of credit.

4. Discussion

This section discusses the position of the Tunisian milling and pasta industries within the context of liberalization, in relation to the European one, by touching aspects of cereal and pricing policy, trade and subsidies, based on the results of the study and the literature consulted.

Position of the Tunisian milling and pasta industries against the European one: a recent study by MIE (2004) concluded that the Tunisian milling industry presents the potential to be competitive against Europe. The main findings of this study are that:

- Compared to Europe, the Tunisian milling industry caters to a less-demanding clientele. Consumers are more responsive to price than quality. As a result, providers have limited incentive to improve quality. This situation is made worst by the regulation framework of the industry which pushes the millers towards adopting a conservative attitude towards quality.

- For Durum wheat (semolina) mills, upstream integration is a fundamental economic choice, both in Tunisia and Europe. It is not so for the bread wheat (flour) mills.

- Cost wise, Tunisian companies are almost as competitive as European companies. The milling cost in Tunisia is half than Europe because of lower salaries and energy costs. Financial and equipment write off costs, however, are more advantageous in Europe. The net margins are inferior in Tunisia because selling prices are fixed by the government.

- Tunisian millers show real competitiveness in the export of both flour and semolina.

- Capacity greatly determines productivity. The capacity of European semolina mills is higher than that of Tunisia. Yet, due to lower salaries, the Tunisian milling industry is competitive.

The comparison of Tunisian pasta industries to that of their European counterparts highlights that European countries have an advantage in terms of semolina quality because of the regular quality of the wheat available to them (if not from local production, from imports of high quality grain from Canada, the US or Australia), which allows them to readily produce high quality semolina mixtures. The integration and size (of the Italian pasta makers and to a lesser degree some French brands) are also among the strong points of successful producers in the Northern Mediterranean. The technology is the same but the know-how in terms of management at all levels is in favour of countries with a longer tradition in pasta making.

Cereal policy in Tunisia: to interpret the performance and effectiveness of the cereal sector in Tunisia and within the context of the liberalization process, it is necessary to analyze cereal policy. The high dependence of agriculture in general to conditions external to the sector is one reason leading the Tunisian government to put in place several administrative regulations, with the aim of ensuring adequate income to farmers and growers, national self-sufficiency for certain products and low consumer prices for staple com-

modities.

These measures are implemented by five instruments of economic policy, the: i) development of agricultural infrastructures and incentives for private investment; ii) mobilization and protection of natural resources; iii) training for farmers and growers combined with dissemination of new technology and methods; iv) control of product prices, agricultural input products and consumer prices; v) and protection of the domestic market against foreign competition.

Because of the critical social and economic roles played by the cereal sector in Tunisia, it remains at the centre of national self-sufficiency strategies. This was reinforced by the occurrence of food riots in 1984, due to hikes in cereal consumer prices, which forced the government to renounce giving-up consumer level subsidies and resulted in cautious and conservative policy with regards to consumer prices. It is believed that the government is the only economic agent that has the ability to regulate cereal markets through interventions at different levels of the chain, partly relying on the OC to ensure reliable cereals availability.

Cereal pricing policy: Cereal prices are fixed (1) based on the international prices; (2) current production costs and (3) strive to ensure sufficient protection for local production (MARH, 2008).

The examination of nominal wheat price evolution indicates that it went through four phases. During the sixties, wheat prices increased very slowly, actually only in 1967, by 14.3% and 24.6% respectively for durum and bread

wheat. During the seventies, the increase was more regular and higher than in the past. The implementation of the Agricultural Structural Adjustment Program has accentuated price liberalization, resulting in prices even higher than world prices.

A relative stabilization was recorded until mid 2006, when high increases of world prices started being recorded, culminating during the 2007-2008 and 2008-2009 seasons. Such increases pushed the government to adjust the durum wheat producer prices by 22% in 2007 and 37.5% in 2008, and bread wheat by 22% and 29% respectively in 2007 and 2008. However, despite these adjustments and observed declines in international wheat market prices during late 2008, the domestic price of wheat is still well below the world price.

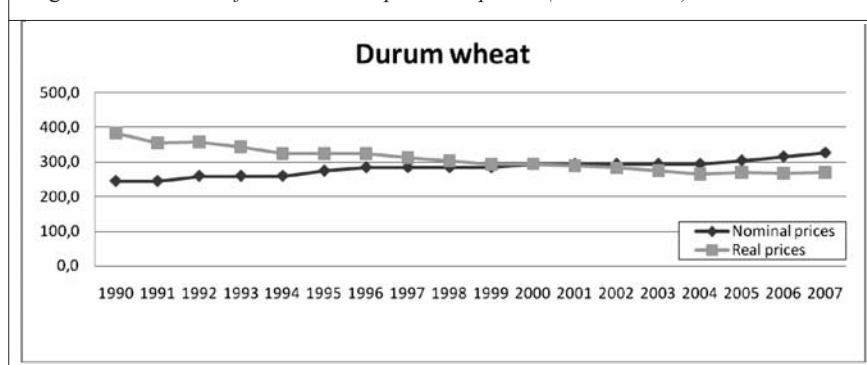
This shows that the wheat market in Tunisia is, in fact, currently taxed. Figure 2 and 3 show the evolution of nominal and real producer prices: real prices (price index, base 100 in 2000) seem to be declining and do not follow the same trend of their nominal counterparts.

The consumer pricing policy aims to protect the consumer by subsidizing prices at purchase

Figure 2: Evolution of bread wheat producer prices (MARH, 2008).



Figure 3: Evolution of durum wheat producer prices (MARH, 2008).



of final product. This can be justified by the large dependence of the Tunisians on cereal product for their nutritional intake (as discussed earlier in the section on consumers). Maximum consumption is projected to reach a peak of 1.8 million tons in 2010 (MARH, 2008). The evolution of durum wheat real consumer prices shows two phases: before 2004 very slow increases, after 2004 important decreases. The same can be observed for bread wheat, where real consumer prices increased until 2000 and then decreased (Figure 4, 5).

Cereal pricing policy is characterized by a double intervention: the government intervenes upstream by fixing producer prices to ensure a minimal guarantee for producers, and downstream by fixing consumer prices to protect the consumer's purchasing power. Transformers are paid on the basis of fixed milling margins calculated by estimating the cost of transforming a ql of wheat. In the case of a technical progress reducing the transformation cost, the productivity gains are transferred to producers or consumers by using the OC monopoly of cereals markets to keep producer prices up and miller's prices down. But according to the World Bank (2006) the cost of its interventions does not equal the supposed benefits. At a budgetary cost of 180 million TND per year, the OC's interventions reduce the price to millers by 2.9% at most. In other words, it costs 12\$ per consumer per year to deliver a benefit to the consumer of 1.30\$. Another efficiency problem related to this kind of policy is related to market margins. In fact, for all staple commodities characterized by a government intervention at the producer and consumer levels, market margins are low and at times negative. Generally, low market margins discourage the private sector from these activities implying more public sector involvement in commercialization activities and deficits are likely (Roe, 1993). Moreover, in Tunisia the OC's monopoly retarded the modernization of quality control, transportation, storage, trading techniques, risk management, etc. (MIE, 1998).

The Government's reliance on the OC to ensure cereal grain availability is related to the critical importance of cereal in the food security of Tunisia, also in the light of avoiding future food riots, such as those occurred in 1984. However, economic causes of food shortages in the past (foreign exchange shortages caused by macroeconomic imbalances) may represent less of a threat nowadays, though they are still possible, while threats linked to shortage of grain due for instance to drought are not entirely unlikely. A small strategic reserve, with releases targeted at specific vulnerable groups during crises, would serve the purpose more cheaply than the OC's operations. Hence it is

Figure 4: Evolution of durum wheat consumption prices.

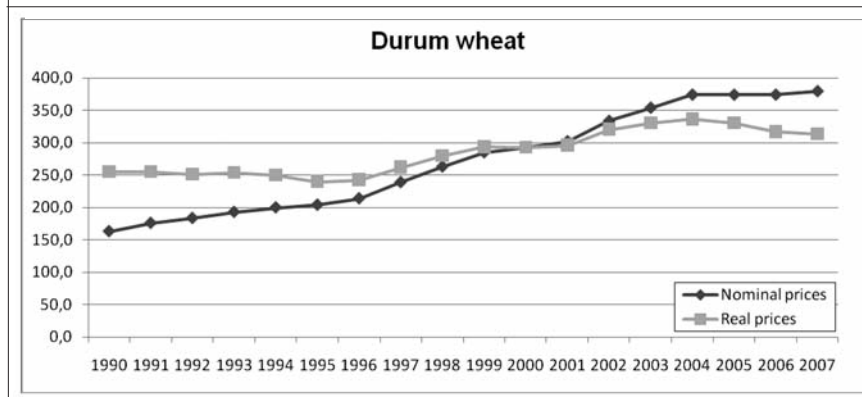
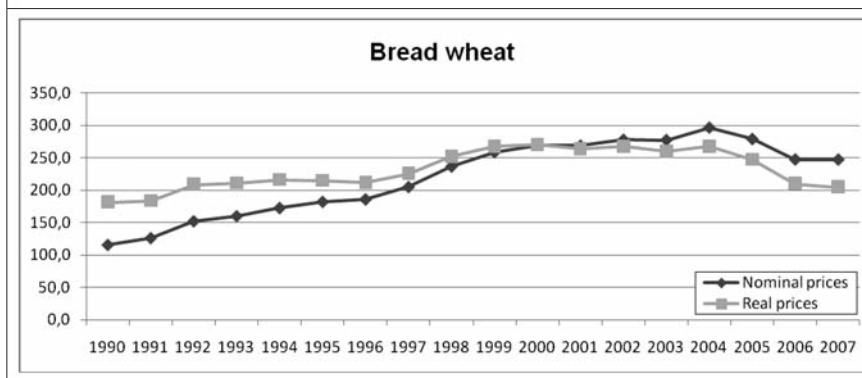


Figure 5: Evolution of bread wheat consumption prices.



conceivable that the state transfers cereals imports and marketing to the private sector. The OC would then concentrate on core public services, ensuring competition, and maintaining a moderate security cereal stock and providing technical support to market players. A private inter-professional group should take the lead in developing the proper trading instruments, such as forward pricing and standard contracts.

Management of subsidies: the CGC is the main funding source through which subsidies are channelled. The CGC budgets have grown dramatically from 162.4 MD (million of Tunisian Dinars) in 1984 to 480 MD in 2007. They represented around 1% of the GDP during the seventies and around 3% and 2% of GDP respectively during the eighties and nineties. Table 2 illustrates the evolution of the CGC loads destined to cereals.

Table 2 shows considerable variability of the annual compensation levels. This can be explained partly by variations of cereal world prices. Indeed, as the import taxes are the

Table 2. CGC loads evolution for cereals (1984-2007).

Year	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Loads	162.4	149	114.4	115.1	186.2	236.4	197.8	185.1	234.8	230.2	185.9	216.8
Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Loads	305.3	261	216.5	126.4	153.5	183	148.5	124.1	172.5	170.9	240	480

Source: Ministry of trade and handicraft (2008)

main income sources for the CGC, when the local price is lower than the international price, the compensation level by the CGC increases. Consequently, when world conditions are not favourable for production and export, the CGC has important deficits after increases in world prices. The compensation destined to cereals was 480 MD in 2007, 85% destined to imported cereals and 15% for locally-produced cereals (Ministry of Trade and Handicraft, 2008). The untargeted nature of CGC interventions encouraged consumption, which increased faster than production, and heavily weighed the public budget without achieving the objective of equity as it benefits also the wealthy or intermediate income categories. The support to the cereal economy is highest in absolute terms compared to other products such as sugar and milk.

Trade policy: given its high contribution in the Tunisian economy, agriculture currently enjoys substantial protection compared with the rest of the economy. Two instruments are still used for protection from external competition: tariff and non-tariff barriers. Overall, the non-discriminatory rates (Most Favoured Nation – MFN) applied by Tunisia remain among the highest in the world (World Bank, 2006). The economy-wide average level of protection reached 34.5% in 2002 against only 12.8% in the same year for middle income countries. Moreover, MFN rates have slightly evolved since the beginning of the 1990s, whereas they declined by more than 40% on average in middle income countries (Chemingui and Lahouel, 2004). For agricultural and food products, they are still highly protected even with the implementation of the partnership agreement with the European Union in 1996, as the agreement has bearing only on non-agricultural manufacturing goods. Thus, imports of agricultural and food products

is currently governed by the commitments undertaken by Tunisia within the multilateral framework of the GATT agreement in 1994. Accordingly, and while all quantitative restrictions are supposed to be converted to *ad-valorem* tariff rates, consolidated tariff rates have been fixed at very high levels. Currently, nominal protection is very high for agricultural and food products, on average 89% and 72% respectively. However, these tariff rates vary across products; relatively high for forestry, meat, dairy products, processed cereals, and canned products, but lower for cereals grain and livestock. Table 3 shows that lowest tariffs are for cereals whereas they are relatively high for milling products.

Nevertheless, Tunisia has preserved preferential customs duties, as part of its offer to the GATT agreements of 1994, applied for certain products. As illustrated by Table 4, lower tariffs are applied under the preferential quota systems and higher tariff rates are applied for imports exceeding the level of the quota. In general, preferential quotas are set at levels that cover the deficit of the food balance in cereal products. All import operations of cereal products are made by the OC. The objective of this policy is to guarantee continuity of the necessary import operations in order to satisfy domestic demands at relatively low costs, while protecting local production through the exclusion of private operators from these imports.

Even with the tariffing of Non Trade Barriers under the GATT agreement, Tunisia is still using non-tariff barriers to regulate its agricultural and food imports. Accordingly, public monopolies on the import of some agricultural and food products are the main tools of protection for most imported agricultural and food products in the country.

5. Conclusions

For discussing the implications of wheat trade liberalization, trade policy is a starting point of the analysis, as prices and crop profitability depend on it. Tunisia's trade policy and generally the agricultural policy were designed to ensure food security for its population. In the last forty years, the modernization of agriculture and isolation from external competition has permitted Tunisia to substantially increase its output, yields, and self-sufficiency rates in strategic products, including cereals. This policy was aimed at reducing the exposure of Tunisian farmers to food price instability in world markets, preventing consumers from the risk of scarce food supply, and expanding a productive activity that involves the majority of the population. The context is now changing. First, Tunisia has started to liberalize its agriculture after the signature of the GATT agreement, and has taken part in 1999 in trade talks on agriculture held under the auspices of the WTO. It has also engaged in a partnership with the European Union (EU) which stipulates, among others, the creation of a

Table 3: Applied tariff rates for selected agricultural and food products in 2006 (in %).

	Effective tariff rate on imports from the EU (%)	Effective tariff rate on imports from the rest of the world (%)
Cereal crops	10	11
Livestock products	25	33
Forestry products	26	30
Dairy products	20	22
Milling products	38	49
Canned products	47	50

Source: author's calculations from INS and COMTRADE data base

Table 4: Cereal imports under tariff quota and customs duty rates in 2005.

Description of Product	Average		Tariff quota commitment (tons)	2002	2003	2004
	quota rate	out-of-quota rate		Utilisation rate	Utilisation rate	Utilisation rate
Durum wheat	17	73	300,000	100	0	0
Soft wheat	17	73	600,000	100	85	100
Barley	17	73	200,000	100	100	100

Source: WTO, 2005

free trade area for industrial goods which was implemented in 2008, the reinforcement of political cooperation and, more recently, a protocol on trade of agricultural products. This new agreement consists in increases in preferential quotas (with free access) into the markets.

In an era of globalization, domestic agricultural prices are no longer determined exclusively by participants in local or even regional markets. An increase in agricultural international prices would directly lead to increases in domestic prices. This would change the agricultural terms of trade, which are the primary determinants of real output and incomes in rural areas.

Trade liberalization is expected to have an impact on various stakeholders through various transmission channels: employment, prices (production, consumption, and wages), assets and transfers. It affects the sector's demand for labour, particularly for those that employ the poor and produce tradable commodities. Contractions and layoffs in the non-tradable sectors may occur, with the welfare of households, mainly those with low income, which can be affected.

The potential social consequences on rural and urban households of a reduction of barriers to trade on cereal gross and transformed products through multilateral trade liberalization are complex and only partly understood, and are discussed in the following paragraphs.

We assume that internal cereal prices are freely determined, hence cereal prices are no longer fixed by the OC and any change in international prices will be directly transmitted to the Tunisian economy. In other terms, this implies an efficient cereal value chain in the sense that any increase in the international price would benefit cereal growers.

The analysis of the implications of agricultural trade liberalization at the level of a country must not be limited to the mere removal of tariffs and non-tariffs barriers imposed on imported products. The trade balance situation of the agricultural products, for such a small country like Tunisia is largely determined by world prices, these being the result of policies implemented in rich countries exporting agricultural products. Undesirable effects of the high agricultural protectionism in the rich exporting countries of basic agricultural products have appeared through the decades. On the one hand, protection has depressed agricultural world prices, which, in fact, penalized all farmers by shrinking the world market. On the other hand, protection has produced a much greater instability of world prices, which precipitated all countries into the vicious circle of protection. A potential conclusion of the Doha round, according to the ministerial declaration of Hong Kong could increase the world market of basic agricultural products, and reduce the distortions affecting it. Then, a significant increase in international cereal prices would be the outcome of multilateral trade liberalization.

In the last and concluding section we discuss the likely impacts of increases in international cereal prices resulting from liberalization with emphasis on the other elements of the value chain: rural and urban livelihoods and higher levels of the

chain, the millers and pasta producers. A rise in international cereal prices from fully freed world agricultural trade and the removal of distortions affecting them would be transmitted to the Tunisian agricultural economy. Accordingly, the impact of agricultural trade liberalization would be reflected more on the way how changes in world prices will affect the Tunisian economy and the level and severity of producers and consumers poverty. For those agricultural workers who are initially the poorest, the net effect depends on the level of generated income from the alternative activities compared to the situation without trade liberalization. Moreover, the effect also depends on the extent to which income changes are compensated by changes in the structure of the final consumption through the ability of each household to switch towards consumption of goods that become relatively cheaper. Prices determine real household income, directly since they have an important bearing on income and indirectly on non income measures of welfare. For the poor farmers, the cuts in input subsidies (animal feed and irrigation water) within the context of internal reforms had little impacts on incomes because of their low use of these inputs. This implies that the impacts of trade liberalization on their incomes will be channelled mainly by relative changes of output prices. The positive impact on output prices will increase cereal gross margins and profitability. Furthermore, cereal supply proved to be price responsive in the past when farmers increased their production level following the increase in cereal prices (Hachicha, 1991). Hence, we would expect a positive impact on the incidence of poverty given that the bulk of poverty in Tunisia is in rural areas. However, these effects are likely to be negative for the urban households who are likely to become adversely affected by the higher consumption prices they would face to purchase food and agricultural products.

Although Tunisia may face declining terms of trade, as it is a net food importer with cereal imports at about 40% of total food imports, there will be efficiency gains. The combined effect would be positive for Tunisia if the gains are larger than the losses in terms of trade. Furthermore, gains (or losses) are always weaker when consumers and producers are limited in their ability to respond to new opportunities and new challenges. Flexible factor markets allow production factors (such as land, labour and capital as well as water and other inputs) to be reallocated from the uncompetitive activities to newly profitable ones. Flexibility is more likely to be enhanced by effective agricultural services such as extension and market information systems that can provide farmers with useful information about the agronomic and economic aspects of improving the management of competitive cereal crops and shifting into new commodities. According to the World Bank (2006), the Tunisian durum wheat is competitive whereas soft and non-wheat cereals are uncompetitive. Hence a specialization in producing durum wheat would be a possible outcome of liberalizing cereal production in order to enhancing the economic competitiveness of wheat production in general.

Looking now at millers and pasta producers, the results of

our review suggest that government interventions via the OC send them the message of going for volume and low prices rather than for quality. Government controls retail margins, pays inadequate quality bonuses for cereals and caps the price of processed food. Millers and pasta producers are dependent on the OC for grain quality. This is why almost all interviewed managers expressed disinterest in obtaining a quality certification. Protection of these products in the local market not only reduces consumer choices, but also impedes the development of a quality-oriented sector that is better able to compete in global markets. The survey has shown also a high transformation potential with equipments generally comparable to their European counterparts. However, the administrative centralization of the marketing chain has discouraged the private sector from restructuring and led to excess capacity at the transformation level. In this context, milling companies with a high transformation capacity may open small market niches abroad, hence increasing the degree of use of facilities and allowing faster pay-off of the investments made.

An increase in cereal prices (resulting from agricultural trade liberalization) will increase production costs and will be transmitted to final producer prices (pasta, couscous). Consumer prices will also increase leading to deterioration of urban household's welfare as well as poverty indicators. However, for the rural households the results depend on the importance of the income effect generated by higher cereal prices, which can offset the negative effects of higher consumption prices when they are considered as consumers. The net rural welfare effect will likely be positive depending on the amplitude of international cereal price increase.

The benefit of such reform is that it will make the supply chain more responsive by removing price distortions. Allowing markets to freely set prices is an "apex reform" because it makes other reforms more effective. For example, the more the price system rewards the farmers for growing high-quality cereals, the more cereal-growers will take advantage of improvements in farmer groupings, extension services and so on. This will be transmitted to transformation industries that will produce at better quality and improve their competitiveness towards the imported pasta products. Liberalization of the sector could also push the industry to look for quality locally, therefore become a likely sponsor for agricultural research and innovation and technology transfer and break the government monopoly on funding research and extension.

It is obvious that trade policy reforms will result in some households winning and some others losing at least in the short run, and consequently can affect poverty. One stand is just to accept these losses if they were necessary to move the economy toward higher level of efficiency and competitiveness. An alternative stand is to argue against any reform that hurts any group, especially if it is the poorer ones. These positions sound extreme, but as Harrison et al. (2000) have argued, they have often prevailed. For Richardson (1995), the real question, which brings us back to the old compensation

issue, is whether reforms should be implemented just if total benefits exceed total costs, or only if those who lose are fully compensated.

References:

- Chemingui M.A. and Lahouel M., 2004. *Profil Tunisie: la Politique Commerciale*. Femise, Institut de la Méditerranée et ERF. Forthcoming.
- Harrison G.W., Rutherford T.F. and Tarr D.G., 2000. "Trade Liberalization, Poverty and Efficient Equity", mimeo, the World Bank.
- Hachicha K., 1990. La réponse de l'offre céréalière. Mémoire de fin d'études du cycle de spécialisation de l'INAT.
- Khalidi R., 2003. Evaluation économique du processus technologique: conception, adoption et performances cas des blés en Tunisie. Thèse de Doctorat. Institut National Agronomique de Tunisie.
- Khalidi R., 1984. La politique céréalière en Tunisie. Ressources. CIHEAM.org /om/
- Ministère de l'Agriculture et des Ressources Hydrauliques, 2009. Budget Economique.
- Ministère de l'Agriculture et des Ressources Hydrauliques, 2008. Budget Economique.
- Ministère de l'Agriculture et des Ressources Hydrauliques, 2006. Revue du secteur agricole. Etude de la filière des céréales.
- Ministère de l'Agriculture et des Ressources Hydrauliques, 2005. Etude de préparation d'un programme pour la mise en place de structure de base multiservices pour la collecte des céréales.
- Ministère de l'Industrie et de l'Energie, 2004. Etude de positionnement de la branche Minoterie – Semoulerie.
- Ministère de l'Industrie et de l'Energie, 2003. Etude de positionnement de la branche pâtes alimentaires et Couscous.
- Ministère de l'Industrie et de l'Energie, 1998. Etude de la filière des céréales en Tunisie.
- Office des Céréales, 2003. Eléments de réflexion sur la coopérative centrale des semences COCEM.
- Richardson J.D., 1995. "Income Inequality and Trade: How to think, what to conclude?", *Journal of Economic Perspectives*, vol 9, number 3.
- Roe T.L., 1993. Land reform, privatization, and development: Discussion. *American Journal of Agriculture Economics*. 75.1260-1262.
- Sghaier M., 2004. Les changements des systèmes de vulgarisation et leurs impacts sur le transfert de technologies en Méditerranée. In Cantero-Martínez C. (ed.), Gabiña D. (ed.) *Mediterranean rainfed agriculture: Strategies for sustainability*. Zaragoza (Spain): CIHEAM-IAMZ. p. 309-316
- UNDP, 2004. Les défis de la mondialisation. <http://www.tn.undp.org>
- World Bank, 2006. Tunisia Agricultural Policy Review. Report No. 35239-TN
- World Bank, 2003. Tunisia Poverty Update, Volume I: Main Report, Washington D.C.