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Determinants of Wheat Import Demand

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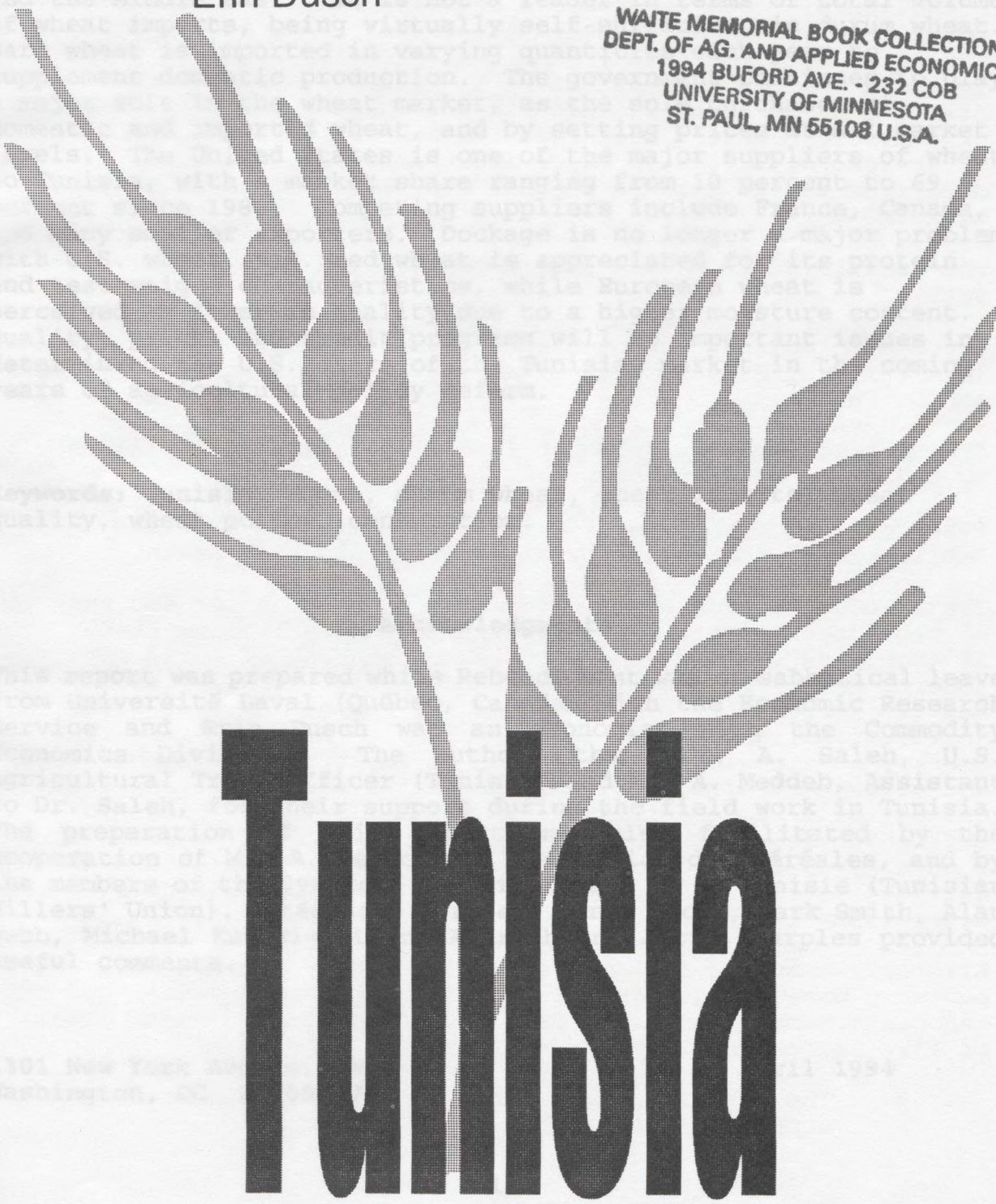

Tunisia

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Abstract

Tunisia has the world's highest per capita consumption of wheat and is representative of growing cereal markets in North Africa and the Middle East. It is not a leader in terms of total volume of wheat imports, being virtually self-sufficient in durum wheat. Hard wheat is imported in varying quantities each year to supplement domestic production. The government continues to play a major role in the wheat market, as the sole purchaser of domestic and imported wheat, and by setting prices at all market levels. The United States is one of the major suppliers of wheat to Tunisia, with a market share ranging from 10 percent to 69 percent since 1980. Competing suppliers include France, Canada, and many smaller exporters. Dockage is no longer a major problem with U.S. wheat. U.S. red wheat is appreciated for its protein and test weight characteristics, while European wheat is perceived as lower in quality due to a higher moisture content. Quality, price, and credit programs will be important issues in determining the U.S. share of the Tunisian market in the coming years of agricultural policy reform.

Keywords: Tunisia, wheat, durum wheat, wheat imports, wheat quality, wheat policy, consumption.

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Preface

This report is 1 of 17 reports covering 18 wheat-importing countries prepared by the Economic Research Service (ERS) in support of a comprehensive study of cleaning U.S. wheat destined for export. Similar reports are forthcoming for corn and soybeans.

The Food, Agriculture, Conservation, and Trade Act of 1990 (FACTA) required the Federal Grain Inspection Service (FGIS) to establish or amend grain grades and standards to include, "...economically and commercially practical levels of cleanliness." The legislation required FGIS to determine if the benefits of cleaning exceeded the costs. FGIS subsequently asked ERS to conduct the study. The comprehensive study on wheat included two major components: 1) economic-engineering studies of the cost of wheat cleaning in the United States and estimates of domestic benefits from cleaning and 2) a series of in-country interviews of buyers in major wheat-importing countries to determine the effects of cleaner U.S. wheat on sales in these markets.

The results of this work have been prepared in a three-volume set:

"Economic Implications of Cleaning Wheat in the United States" (AER-669), by B.T. Hyberg, M. Ash, W. Lin, C. Lin, L. Aldrich, and D. Pace;

"The Role of Quality in Wheat Import Decisionmaking" (AER-670), by Stephanie Mercier; and

"The Costs and Benefits of U.S. Cleaning Wheat: Overview and Implications" (AER-675), by William Lin and Mack Leath.

The 18-country case studies form the foundation for the results of the international component of the wheat-cleaning study. The 18 countries studied accounted for 58 percent of world wheat imports and 63 percent of U.S. wheat sales in 1991. Each report has two components: background on the wheat-marketing policies, institutions, and distribution system in the wheat-importing country and results of interviews of wheat traders, processors, and government officials. All the interviews were completed during April-September 1992, and all followed a similar format. Each interview team consisted of both a commodity specialist and a country specialist. They attended a series of seminars on grain quality issues, data collection, and interview procedures before doing their interviews.

All the interviews followed a specific set of guidelines. An advisory panel of government officials, private traders and trade association members helped develop the questions, which consisted of five topic areas:

- The most important factors in the choice of a supplier country;

- Quality factors most important to the importer's purchase decisions and the importer's perception of wheat purchased from their suppliers;
- Contract specifications the importer uses to communicate preferences;
- The level of dockage in the shipments the importer receives and the costs of removing it; and
- If U.S. wheat were cleaner, would the importer purchase more and/or be willing to pay more?

The background information on the wheat-importing country and the responses from the interviews provide a unique insight into the role of quality factors in the wheat purchase decisions of the major importers of U.S. wheat.

Alan J. Webb
Coordinator, Country Case Studies

Reports in the Series, "Determinants of Wheat Import Demand"

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Contents

Summary

Although agricultural policy reform is underway in Tunisia, the government continues to play a major role in the wheat market, as the sole purchaser of domestic and imported wheat, through the Office des Céréales (Office) of the Ministry of Agriculture. Prices for wheat and wheat products are fixed by the government at all market levels. Thus, producers, millers, processors, and consumers all face fixed margins. Furthermore, the use of panseasonal and panterritorial prices has removed all incentives for private investment in storage and transportation infrastructure. Public investment in this infrastructure is judged by those in the industry to be inadequate for Tunisia's needs, and less than the level of private investment that would occur under liberalized grain markets.

Tunisia is virtually self-sufficient in durum wheat. Bread wheat is imported in varying quantities each year in an effort to supplement domestic production to meet demand. With domestic production of bread wheat ("blé tendre" in Tunisia) varying up to 500 percent, imports are highly variable and thus difficult to predict. All wheat imports are undertaken by the Office using a bidding process in which local representatives of major grain-trading companies participate.

The United States is one of the major suppliers of wheat to Tunisia, with a market share which has varied widely from year to year since 1980 ranging from 10 percent to 69 percent. Competing suppliers include France and many smaller exporting countries. Tunisia benefits from subsidy programs from these supplying countries, such as the French COFACE program. Tunisia currently purchases wheat from the United States under PL-480 (Title I), GSM-103, and the Export Enhancement Program (EEP).

Quality problems with U.S. wheat include the content of shrunken and broken kernels and dark color. Dockage is no longer a difficulty, as it had been 3 years ago. Dockage levels now average less than 1 percent by weight. Hard red wheat from the United States is appreciated for its protein content and test weight characteristics. European wheat is considered to be the poorest quality for moisture content, protein content, and sprouted grains, as well as a poor dough elasticity.

Quality, price, and credit programs will be important issues in determining the U.S. share of the Tunisian market in the coming years of agricultural policy reform. While not a leader in terms of total volume of wheat imports, Tunisia does have the world's highest per capita consumption of wheat, and thus is an interesting "test case" for U.S. wheat markets in Africa and the Middle East.

Tunisia

Determinants of Wheat Import Demand

Rebecca Lent and Erin Dusch

Overview of the Wheat Market

The smallest of the three Maghreb countries, Tunisia covers a land area of just over 150,000 square kilometers and has a total population of 8.3 million with a relatively high urbanization rate of 54 percent (table 1). Per capita gross domestic product is $1,882, considerably higher than that of Morocco but below that of Algeria. Tunisia has a relatively high level of foreign reserves, reflecting tourist income as well as remittances from Tunisian citizens working abroad.

Tunisia has undergone structural adjustment policies since 1986, including some cereals market liberalization and a greater role for private firms in the importing of goods and sale of agricultural inputs. Agricultural output can be increased with investment projects and provision of public goods such as extension programs. But output is highly variable due to weather conditions.

Wheat Supply and Demand Trends

Tunisia, like the other North African countries, is a traditional producer and consumer of wheat and other cereals. Annual domestic harvest varies considerably, in large part due to dependence on rain-fed production under uncertain climatic conditions. Maghrebians have the highest per capita consumption of wheat in the world (Newman and Kristjanson, 1991), thus shortfalls in domestic production are characteristically compensated by increases in imports (table 2).

Table 1--Tunisia: Economic indicators and wheat prices

Item	Unit	1981-85 average	1987	1988	1989	1990	1991	1992
Gross Domestic product	Million dinars	5522.6	7997.0	8685.0	9661.0	10990.0	12194.0	13928.0
Gross Domestic product	Million U.S. dol	7930.2	10280.2	10124.7	10177.0	12512.8	13188.4	15748.5
Per capita	Per Capita (U.S. dol)	1152.6	1347.3	1226.3	1312.3	1550.5	1604.4	1881.5
	Million 1980 dinars	3993.2	4529.9	4599.1	4741.4	5101.0	5290.0	5745.0
Percent change	Percent			1.5	3.1	7.6	3.7	8.6
Imports (Goods & NFS)	Million U.S. dol	3530.4	3699.7	4026.7	4976.8	6141.0	5991.0	6601.0
Percent change	Percent			8.8	23.6	23.4	-2.2	10.2
Exports (Goods & NFS)	Million U.S. dol	2817.3	3594.3	4073.5	4495.9	5211.0	5272.0	5668.0
Percent change	Percent			13.3	10.4	15.9	1.0	7.5
Foreign debt	Million U.S. dol	2570.6	4101.9	4168.0	5678.0	6506.0	7111.0	7303.0
Exchange rate	Dinars/U.S. dol	0.7	0.8	0.9	0.9	0.9	0.9	0.9
Population	Millions	6.9	7.6	7.8	7.9	8.1	8.2	8.4
Percent change	Percent			2.4	2.4	2.5	2.5	2.4

Fixed wheat price structure for 1992: c)

	Dinars/quintal
Domestic producer price for bread wheat	24.0
Price paid by mills for bread wheat (domestic or imported)	10.0
Sale price received for bread flour by mills	14.3
Price paid by bakers for bread flour	11.2
Refund Office pays to mills	3.1
Maximum sale price of millfeed	8.0

Sources: Macroeconomic indicators from IMF, wheat prices from field interviews.
a) 10 quintal equals exactly 1 ton.
b) World Bank Goods and NFS.
c) Incorporates large subsidies

Table 2--Tunisia: Wheat supply and use, 1960-92

Year	Area harvested	Yield	Production	Imports	Imports from U.S.	Consumption	Per capita consumption	Feed	Ending stocks	Population
	Ha	MT/Ha	--------Thousand MT----------			1,000 MT	Kilograms	------1,000 MT------		Million
1960	1354	0.32	439	212	178	565	136	83	35	4.16
1961	942	0.26	243	368	368	552	130	79	85	4.26
1962	848	0.46	393	246	245	553	127	84	102	4.35
1963	1130	0.58	652	85	85	570	128	74	90	4.44
1964	1110	0.38	421	170	161	496	109	69	87	4.53
1965	1107	0.47	521	199	67	673	146	94	47	4.62
1966	845	0.41	349	256	206	511	108	87	38	4.72
1967	815	0.40	330	433	251	696	144	90	105	4.82
1968	833	0.46	383	263	217	691	140	91	60	4.92
1969	745	0.45	336	539	233	825	164	109	110	5.03
1970	1030	0.34	349	381	198	745	145	116	95	5.13
1971	950	0.69	660	229	193	960	185	120	24	5.20
1972	1040	0.85	887	237	71	1057	200	120	91	5.28
1973	1140	0.72	820	290	138	1140	214	130	61	5.33
1974	1070	0.74	795	285	172	1090	200	120	51	5.46
1975	1065	0.91	965	301	87	1235	220	130	82	5.61
1976	1050	0.77	810	457	132	1279	222	130	70	5.77
1977	964	0.59	570	761	272	1261	213	100	140	5.93
1978	1138	0.66	750	603	161	1388	228	130	105	6.08
1979	1134	0.60	680	856	471	1430	230	0	211	6.22
1980	853	1.02	869	610	206	1509	236	0	181	6.39
1981	783	1.23	963	626	227	1649	251	0	111	6.57
1982	714	1.28	916	695	205	1644	245	0	72	6.70
1983	931	0.66	618	1035	453	1670	244	0	55	6.84
1984	900	0.79	711	858	572	1624	231	0	0	7.03
1985	1033	1.34	1380	632	64	1762	243	0	250	7.26
1986	540	0.88	474	943	612	1577	211	0	90	7.46
1987	971	1.40	1360	904	645	1989	261	0	368	7.63
1988	299	0.74	220	907	249	1252	160	0	238	7.81
1989	557	0.75	420	964	326	1464	185	0	158	7.90
1990	882	1.27	1122	1022	485	1719	213	0	583	8.07
1991	1073	1.66	1786	523	156	2142	261	0	750	8.22
1992	981	1.61	1584	700	367	2084	249	0	850	8.37

NA = not available.
Sources: USDA, PS&D View database; Newman et. al., for Opening stocks and Feed, 1989.

Production

Tunisian wheat production varies considerably from year to year, and reached a peak of 1.8 million mt in 1991. Durum wheat accounts for about 60 percent of total cereal production, with the bulk of the harvest (80 percent) occurring in the northern regions, which benefit from higher average rainfall (Newman et al., 1989). Durum wheat accounted for 58 percent of total grain production in 1987/88, while bread wheat and barley amounted to 18 percent and 25 percent, respectively. Farmland distribution is skewed: nearly 60 percent of farms are smaller than 10 hectares, in contrast with less than 5 percent of the farms exceeding 50 hectares. Wheat imports in 1987/88 reached nearly 70 percent of domestic consumption.

Quality Characteristics of Domestic Wheat

Tunisian durum wheat is considered by the millers to be of very high quality in terms of moisture, protein, and gluten content. Indeed, this wheat is considered of such high quality that it is mixed with hard wheat imports in a 20 percent-40 percent-40 percent combination, Tunisian-U.S.-European, respectively, as only 20 percent of domestic wheat is necessary to assure the desired quality flour for baking and other uses. It is not always easy, however, to achieve this "optimum mix," as domestic wheat is available only in limited quantities over a relatively short period of time during the year.

Tunisian wheat contains considerable amounts of foreign material, most of which stems from low technology for both harvesting and transporting the grain. Low-level technology in harvesting grain implies that rocks and non-wheat plant material (weeds, other grains) are collected at the same time. Because of insufficient storage and transportation facilities, the Office des Céréales (Office) must use burlap bags for collecting, storing, and transporting domestic wheat, which results in product damage as well as a higher level of foreign matter in the wheat at the milling point.

Consumption

Per capita consumption of wheat in Tunisia is 93 kg/year (wheat basis) of bread wheat and 83 kg/year of durum wheat, for a total of 176 kg, considerably higher than that of Algeria and Morocco. When all cereal varieties are considered, durum wheat accounts for 57 percent of total cereal consumption, while bread wheat and barley are 39 percent and 4 percent, respectively. In contrast with Morocco, most bread is commercially baked in Tunisia, and accounts for 75 percent of wheat product consumption in urban areas. The rural population consumes primarily durum wheat, in the form of couscous and traditional flat breads. Durum wheat is also used to make pasta, which is purchased primarily by urban consumers.

Increasing urbanization, the rising participation of women in the workforce and new consumption tastes acquired by Tunisian workers in foreign countries have led to an increase in the demand for ready-made and easy-to-prepare foods. High bread consumption and the growing popularity of pasta products attest to these trends.

Imports

Tunisia's wheat imports fluctuate considerably, accounting for a low of 26 percent of total consumption in 1991 to a high of 66 percent in 1989. These variations are the mirror image of the domestic harvest, as imports are purchased solely for supplementing national production to meet demand. While Tunisia is practically self-sufficient in durum wheat, a significant, but variable, share of bread wheat (referred to as "blé tendre" in Tunisia) is imported (table 3).

Each year, the Tunisian Ministry of Agriculture issues the wheat harvest forecast. Based on these figures, the Office calculates the volume of wheat imports necessary to meet domestic demand at the government-fixed prices. This policy is evident when examining trends in imports and domestic harvest; peaks in one are offset by troughs in the other. Due to the Office of Cereals' limited storage capacity, an import schedule is also established in order to space shipments evenly throughout the year.

Wheat imports thus complement domestic wheat production in terms of quantity. In addition, Tunisian millers attempt to complement domestic wheat characteristics by mixing grains of different origins, as indicated above, in a 20-40-40 combination. This optimal mix is not always achieved, however, as the greater share of imported wheat is purchased outside the peak domestic season. To the extent that the Office and the millers are able to store grain, the procedure of blending wheat from different sources will be more feasible.

Tunisia's wheat imports from 1979 through 1990 ranged between 500,000 and 1 million tons. The composition of suppliers varied widely as well (table 4). While the chief exporters of wheat to Tunisia have been the European Community and the United States, Canada and many smaller exporters (Argentina, Australia, Finland, Sweden, Turkey, Yugoslavia, and Saudi Arabia) have also exported wheat to Tunisia. The U.S. share of the Tunisian wheat market from 1979 through 1990 ranged from a low of 10 percent in 1985/86 to a high of 69 percent in 1984/85. The estimated U.S. market share for 1990/91 was 57 percent.

U.S. and Competitor Programs

During the early 1980's, U.S. wheat exports to Tunisia were primarily under PL-480 Title I financing (table 5). Tunisia joined Morocco as a major recipient of wheat under the blended credit program from 1983 through 1985. Tunisia began to use 3-year GSM-102 credit guarantees to finance its imports from the

Table 3--Tunisia: Wheat import transactions, 1991*

Call for offers number	Loading date (Month/Year)	Product	Quantity (thous MT)	Dollars/ton f.o.b.	Dollars/ton C&f	Origin
2	4/91	Common wheat**	25	71.94	86.84	EEC
2	6/91	Common wheat	25	71.94	86.84	EEC
2	7/91	Common wheat	25	70.00	85.45	Mixed***
2	7/91	Common wheat	25	70.00	85.45	Mixed
2	5/91	No.2 HRW	25	65.00	89.00	USA
2	5/91	No.2 HRW	25	65.00	89.00	USA
2	6/91	No.2 HRW	25	65.00	89.00	USA
2	7/91	No.2 HRW	25	65.00	89.00	USA
3	3/91	Durum	25	87.40	107.34	Mixed
3	4/91	Durum	25	88.90	108.84	USA
3	5/91	No. 3 HAD	25	82.00	107.00	USA
4	3/91	Common wheat	25	76.00	89.50	Europe
4	4/91	Common wheat	25	70.98	88.69	Mixed
4	8/91	Common wheat	25	79.75	87.95	Mixed
11	11/91	Common wheat	25	91.74	102.74	Mixed/USA
11	12/91	Common wheat	25	92.74	103.74	Canada
12	1/92	HRW	25	87.00	111.50	USA
15	2/92	HRW	25	94.00	119.00	USA
15	3/92	HRW	25	95.00	120.00	USA
15	3/92	HRW	25	95.00	120.00	USA
15	4/92	Common wheat	25	103.00	114.45	Mixed
15	4/92	Common wheat	25	103.00	114.45	Mixed

* These transactions are listed in order of the date of the Call for Offers, not the final shipment. Some shipments were made in calendar year 1992.
** All non-durum wheat is called "ble tendre" in Tunisia, which is indicated here as common wheat. Note that all U.S. exports to Tunisia in 1991 were hard wheat varieties.
*** A grain trader in Tunisia indicated that mixed ("toutes origines") usually refers to European wheat. Wheat sales associated with Call for Offers No. 4 were said to be of Swedish and Danish origins, while the last two were thought to be Turkish wheat.

Table 4--Tunisia: Wheat imports by source (July/June marketing year)

Country of origin		79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91
Canada:													
Imports	1000 MT	49.1	0.0	10.2	0.0	0.0	0.0	0.0	25.5	25.3	33.0	19.4	29.0
Market share	Percent	6.1	0.0	1.5	0.0	0.0	0.0	0.0	2.5	2.5	3.5	2.0	3.3
European Community:													
Imports	1000 MT	207.8	279.2	417.1	297.4	320.4	237.6	597.3	338.9	261.6	498.8	611.9	300.0
Market share	Percent	26.0	53.4	62.5	47.6	33.1	28.7	88.4	33.7	26.3	53.1	63.0	34.1
United States:													
Imports	1000 MT	532.2	214.6	234.9	232.2	623.6	570.4	68.6	640.8	665.8	276.3	325.9	500.0
Market share	Percent	66.6	41.1	35.2	37.2	64.4	68.9	10.2	63.7	66.9	29.4	33.6	56.8
Others:*													
Imports	1000 MT	0.0	0.0	5.0	95.3	23.6	0.0	9.8	0.0	43.0	134.9	14.0	25.0
Market share	Percent	0.0	0.0	0.7	15.2	2.4	0.0	1.4	0.0	4.3	14.3	1.4	2.8
Total:													
Imports	1000 MT	799.6	522.6	667.2	624.9	967.6	828.0	675.7	1005.1	995.6	940.1	971.2	880.0

* For 1989/90 sales to Tunisia, "others" include Finland. For 1990/91, "others" include Canada and Sweden.
Sources: International Wheat Council; USDA estimates for 1990/91 include both wheat and flour.

Table 5--Wheat exports to Tunisia under U.S. export programs, fiscal 1980-91

Fiscal year	GSM-5	GSM-101	GSM-102	Blended credit	GSM-103	All credit programs	Total food aid 1/	Estimated EEP shipments	Average EEP bonuses	Estimated EEP/GSM overlap	Exports	Export program shares
	Metric tons											Percent
1980	-	-	-	-	-	0	95,497	0	0	0	288,691	33.1
1981	-	-	-	-	-	0	21,509	0	0	0	156,685	13.7
1982	-	-	-	-	-	0	116,339	0	0	0	279,982	41.6
1983	-	-	-	141,000	-	141,000	55,910	0	0	0	505,510	39.0
1984	-	-	-	522,000	-	522,000	28,525	0	0	0	662,389	83.1
1985	-	-	-	197,000	-	197,000	0	0	0	0	266,289	74.0
1986	-	-	68,000	-	-	68,000	29,236	0	0	0	118,658	81.9
1987	-	-	431,307	-	-	431,307	178,491	498,041	27.39	498,068	632,477	96.4
1988	-	-	324,555	-	72,603	397,158	158,404	445,936	36.27	445,972	727,986	76.3
1989	-	-	-	-	-	0	94,943	0	0	0	197,980	48.0
1990 2/	-	-	-	-	152,887	152,887	91,970	152,038	14.68	152,038	283,955	86.2
1991 3/	-	-	-	-	272,941	272,941	62,000	420,741	48.89	420,790	485,040	69.0

1/ Food aid includes PL 480 titles I and II; Section 416 (b); and Commodity Import Program sales.
2/ Food aid shipments are preliminary.
3/ 1991 food aid shipments are title I allocations for wheat and flour. Preliminary sales are 56,100 tons for Tunisia.
Sources: Credit guarantee shipments are from annual FAS shipment data are ERS estimates; food aid shipments are from ERS database.
GSM/EEP overlaps are estimated.

Program exports may exceed actual exports due to reporting delays for program shipments.

United States in 1986, but changed to 7-year GSM-103 financing in 1988. GSM-103 allocations for wheat sales to Tunisia for fiscal year 1992 totaled $25 million.

U.S. wheat exports to Tunisia were also facilitated by the EEP beginning in 1986. Tunisia has followed other Mahgreb countries as a highly contested country for U.S. and EC wheat exports. EEP bonuses for Tunisia averaged $50.49 in the 1990/91 June/May marketing year compared with $36.72 for all EEP countries in that year. In recent years, commercial wheat sales to Tunisia have been assisted by the EEP in conjunction with GSM-103.

Tunisia currently purchases wheat from the United States under the PL-480-I and GSM-103 and EEP programs. Personnel at the Office are eager to point out that Tunisia, in contrast with many other wheat importers, is not totally dependent on subsidized credit for their imports. They believe that their ability to purchase without a credit subsidy implies a lower price for their purchases.

The European Community, particularly France, is the major competitor for the United States in exporting wheat to Tunisia. The EC subsidizes wheat exports through an elaborate system of export price subsidies or restitutions. An independent agency of the French government, the Compagnie Française des Assurances pour le Commerce à l'Extérieur (COFACE), also assists importers purchasing French wheat by guaranteeing commercial bank loans. Grain traders interviewed in Tunisia indicated that the Office also qualifies for an Italian export credit program (table 6) although the Office has never used this program.

Wheat Sector Policies

Tunisia has attempted to introduce market reform in its agricultural policy since 1988, although there is still considerable government intervention in the Tunisian wheat market (table 7). Official prices and thus margins at all market levels are fixed by the government (table 1). Spatial and temporal

Table 6--Tunisia: U.S. and competitor programs

Supplier	Price subsidies	Commercial credits	Concessional credits	Food donations
U.S.	yes	yes	yes	yes
EEC	yes	yes	no	yes
Canada*	no	no	no	yes
Saudi Arabia	yes	yes	yes	no

* Canadian wheat is said to be too costly for purchase.

Table 7-- Tunisia: Summary of wheat sector policies

Policy	Policy description
Price intervention	Domestic wheat purchased at government supported price (currently 150 percent of import price) panseasonal and panterritorial prices
Input assistance	Some credit, fertilizer, irrigation, and other assistance
Marketing assistance	All transportation and storage costs paid by the Office des Céréales
Infrastructure support	Storage financed by Office
Economy-wide policies	Exchange rate previously over-valued, favoring imports

variation of wheat prices are eliminated through a government policy of panseasonal and panterritorial prices[1] (Newman and Kristjanson, 1991). These policies have eliminated all incentives for private firms to invest in transportation and storage facilities (see discussion below). In addition, the Office is involved in a number of activities peripheral to the main objective of promoting domestic wheat production and consumption, notably investment in hotels, bakeries, and other enterprises.

While the majority of imports and domestic grain purchases are handled by a state monopoly, some of the grain traded in Tunisia bypasses these organizations. For example, private milling companies may import wheat directly if the flour produced from that wheat is destined for re-export. In addition, various bottlenecks in the official marketing channel for domestically produced wheat result in a large portion of the harvest passing through a parallel market of private traders. In 1991, it was estimated that of a total harvest of 2.4 million MT, less than 60 percent was marketed through the Office and the two cooperatives. The growing importance of the parallel market implies that the Tunisian wheat industry is already largely liberalized, albeit unofficially. The percentage of purchases going through the official market varies by region and variety; wheat harvested in the northern part of Tunisia and bread wheat are more likely to pass through official markets (Newman et al., 1989). Also, some

[1] Panseasonal and panterritorial prices refer to a government policy that requires that the price of wheat (at all market levels) is equal throughout the season and throughout the country, respectively.

of the wheat initially purchased by private traders may eventually re-enter the official channel, according to millers interviewed in Tunisia. Finally, some portion of the harvest may be retained by the farmers themselves for their own consumption and for seeds, although the relatively high government price keeps such practices at a minimum.

One of the factors behind the bottlenecks in the official grain marketing system for domestic wheat is the use of a relatively complicated grain trading system discussed later.

Producer Policy

Producers are required to deliver their wheat to government collection centers where their product is supposed to be graded and weighed. Producers are paid a price that is considerably higher than the world price of wheat (table 1). A 1989 report estimates that domestic producers are paid a subsidy equivalent of 150 percent of the price paid by the millers (Newman et al., 1989).[2]

Tunisia has a highly complex, albeit loosely implemented, domestic grading system for wheat. The domestic grading system is based on the use of bonuses and discounts for variations in quality along a scale for certain grain attributes. Grain at the "standard" level receives the base price, while quality variations (such as protein content and foreign material) may increase or decrease the net price received by the producer. A former scale applied to domestic wheat had a large number of divisions in the measures of various quality attributes. The number of divisions in this scale has recently been reduced. However, the new scale remains complex, not only relative to that of other countries (the United States) but, more important, relative to the capacity of the Office to fully conduct and apply the testing, grading, and pricing system. Millers are also subjected to variations in the price they pay the Office of Cereals for wheat according to an equally complex quality attribute scale. In interviews with these millers, they indicated that not only were the rules inconsistently applied, but test results of the Office often diverged from those of the millers.

Once the Office has collected domestic wheat from farmers, millers may purchase wheat at government-fixed prices from the collection centers. Some of the centers serve as storage for imported wheat as well, and "mixing" may occur of imported wheat from various sources. Millers sell their flour, as well as

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[2] During interviews held in Tunisia, some individuals involved in the Tunisian wheat sector expressed the belief that if production subsidies in all producing countries, and export enhancement programs in exporting nations were removed, it would be possible for Tunisia to be a competitive producer of wheat. As long as the larger exporting nations continue to subsidize wheat exports, however, they believe that Tunisia will be forced to compensate its producers relative to artificially low world prices.

byproducts such as millfeed, at prices that are also fixed by the government.

Consumer Policy

Tunisian wheat products are regulated throughout the entire marketing channel, including the retail level, and thus consumers benefit from highly subsidized prices for basic bread, pasta, and other wheat products.[3] In contrast with Morocco, where prices are regulated for a myriad of products, Tunisian millers indicated that wheat is the only product in their country that is heavily subsidized at the consumption level.

Trade Policy

Very nominal import tariffs are applied to Tunisian wheat imports, since, in any case, the sole importer is the government monopoly. As the process of grain market liberalization continues, some analysts anticipate that the Office will shift from a marketing agency to a "market facilitating mechanism," providing price information to market participants, supervising grading standards and their application, and other such roles. While the exact role the Office will play for wheat imports is unclear, there is some consideration that the Office might use the futures market to reduce risk in international transactions.

As for imported wheat, the quality of grain demanded is influenced by the specifications set for imported grains. In the case of U.S. wheat, these specifications include: U.S. No. 2 or better, HRW/NS-DNS; maximum moisture content 13.5 percent; minimum protein content 12 percent; and maximum diseased kernels 0.5 percent.

Policy Reform

As indicated above, structural adjustment policy under way in Tunisia includes grain market reform. Rising costs of government intervention, particularly in the cereals sector, are forcing the Tunisian Government to study options for liberalizing the grain sector. While the short- to medium-term options will probably continue to include subsidization of cereal products, the Tunisian government is considering a gradual removal of subsidies in the long run (Newman et al., 1989).

Some options being considered include the possible removal of fixed seasonal and countrywide prices to encourage private investment in infrastructure.[4] In addition, some activities of the Office which are not directly related to its mission may be

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[3] One Tunisian miller interviewed estimated that a complete liberalization of the wheat market in Tunisia would lead to a 250-percent increase in the price of bread.

[4] Given the significant impact which such reform would have on wheat prices, there is considerable resistance to this policy change.

eliminated. Some researchers see the Office as continuing to maintain a presence in the wheat market, however, more as a "market facilitating" organization, involved in inspection, indirect regulation, and market monitoring for information purposes (Newman and Kristjanson, 1991).

There has also been an attempt to allow millers to import wheat directly (without passing through the Office) as long as it is re-exported as flour. In fact, a special arrangement was recently negotiated between the United States and the Tunisian grain importers under an experimental program. This arrangement permitted 200,000 metric tons of wheat imports from the United States for re-export as flour to Algeria; such re-exports would normally be forbidden under the PL-480 provisions. The millers are having some difficulties in selling their flour to the Algerians since the latter require an 18-month credit arrangement which is not possible for the millers. The future of the program is uncertain.

Marketing and Distribution

Tunisia's wheat and wheat product marketing and distribution system is a mix of public and private activities. However, private actors are subjected to strict government control of prices and other factors at every level of the marketing chain.

Organization of Wheat Imports

Each year toward the end of May, the Tunisian Government calculates the difference between domestic demand and the anticipated harvest, in order to estimate total imports needed for that year. Due to low unloading and storage capacity in Tunisia, these imports are spaced out over the year.

When world wheat prices appear to be relatively low, the Office sends out a call for bids to the 15 or so grain trading offices in Tunisia; most are offices or representatives of multinational companies. Traders must follow specifications indicated on the "Cahier des charges" (specification sheet) as well as on the Appel d'Offre (call for bids;). These traders then make sealed bids. An official "Commission" panel meets for 1 day (about once a month) to decide which bid to accept. The Commission is composed of representatives from the Office, four other ministries, grain millers, and others. Private millers have been represented on this Commission for the past 3 years with one member. In the opinion of personnel at the Office, this representation allows the millers to exert considerable influence on the final decision. According to the millers, however, the contract almost always goes to the lowest bidder.

Traders making bids for the sale of U.S. wheat have to make an educated guess of the bonus they anticipate receiving. Personnel from the Office may verify with the USDA whether a prediction is relatively accurate prior to reaching a decision concerning competing bids. The final bid is determined on the day on which the Commission meets. Country of origin of the wheat may be

generally specified on the bid and precisely identified only once the delivery is made.

Domestic Wheat Marketing System

Except for the price of imported wheat, all wheat and wheat product prices in Tunisia are determined by government policy rather than by the market. Domestic producers of durum and bread wheat benefit from minimum prices set by the government which are considerably above the world price of wheat. The government purchases wheat at fixed prices, assumes storage and transportation activities, and then sells the wheat at a lower price to the millers.

Storage and Transportation of Domestic and Imported Wheat

The lack of sufficient investment in storage and transportation facilities led one of the traders interviewed in Tunisia to comment that the level of turnover in Tunisia's silos is the highest in the world: up to an average of 22 times per year for the silos of the port of Goulette. The lack of storage facilities impedes quality control, as it is difficult to clean out the silos between shipments, and burlap bag storage may be used as a substitute. Also, the "optimal mix" discussed above is not always possible due to the lack of public and private storage capacity.

As with the processing of the domestic harvest, the aging infrastructure of grain receiving, handling, and distribution causes considerable bottlenecks in Tunisian wheat imports. Although certain ports have been modernized with funds from various financing agencies (including the World Bank) for unloading equipment, the lack of storage facilities continues to cause considerable delays and high demurrage costs (Newman et al., 1989). In fact, the Tunisian Government could take greater advantage of seasonally low prices if there were adequate storage facilities, whereas they are presently operating under a binding constraint. Congestion of storage facilities also occurs when domestic wheat production is low, and as a consequence, wheat imports increase.

Domestic Milling and Baking Industries

The Tunisian milling, couscous, and pasta industries are characterized by a relatively high level of concentration. According to millers interviewed, economies of scale are essential for making a profit in wheat milling. There are virtually no more "small" mills by Tunisian standards. Those remaining in the industry tend to mill around 400-600 tons of wheat per day. The largest flour mill in Tunisia accounts for up to 12 percent of total production. The three largest pasta factories account for 80 percent of all pasta manufactured in Tunisia. There are only four couscous factories in Tunisia. It also appears that most millers have other economic activities, such as baking, candy manufacture, wood and paper, trade in other agricultural items, etc.

Given that price cannot act as a signal in the totally controlled wheat market, the Tunisian flour millers have succeeded in using non-price signals and other fairly ingenious methods for dealing with variations in quality and quantity. Several millers have laboratory testing equipment; some have the capability to conduct baking tests. If a mill has sufficient storage capacity, it is able to test each shipment in order to mill an optimal mix for the targeted market (bread or pastry bakers, pasta or couscous factories, etc.). Among the mills visited, storage capacity varied between 2,000 and 6,500 mt. If it is difficult for a miller to obtain high-quality wheat during certain periods, however, then at least customers can be notified of the lower quality such that industrial users can adjust as necessary. Also, as a special favor to preferred clients, the mills may contact certain buyers (particularly the steady, larger buyers) when the quality of wheat being milled is particularly good. Since the Office sells Tunisian wheat only during the domestic harvest season, it is difficult to maintain the optimal mix throughout the year unless the mill has significant storage capacity, as well as access to credit.

Field interviews in Tunisia also revealed that despite the setting of tight margins and, thus, low flour prices, many mills have trouble selling their flour. Some of these problems arise due to low resale price to bakers (set by the government) as well as lack of credit. Various forms of non-price competition are used to handle such surpluses, including quality variation and "bonuses" awarded to buyers. The latter may be in the form of credit, which is particularly appealing to smaller bakers with few other outlets for obtaining credit.

Review of Survey Results

Factors Affecting Choice of Suppliers

All of Tunisia's wheat imports are currently handled by the Office, which supplies quality specifications in the call for bids for wheat imports. Once the bids are in, the Commission charged with evaluating the bids may consider shipments that do not meet quality standards if the price is sufficiently attractive. Thus, price appears to be the major factor in the choice of supplier for Tunisian wheat imports. Most millers interviewed agree with this assessment. At an equal price, various shipments of wheat would be compared on the basis of the most important quality factors. From interviews conducted with the millers, these appear to be: protein content, moisture, and dough elasticity (the W factor), in order of importance (table 8).

Table 8--Tunisia: Summary of factors affecting choice of supplier

Factor	Explanation
Most important:	
Price	Office seeks to minimize purchase costs
Protein content	Considered very important by millers and Office
Moisture	High moisture is problem with European wheat, and may interfere with milling process
W factor	Tunisia no longer purchases U.S. soft wheat due to low W factor
Moderately important:	
Color	Darker color is a minus for bread flour, a plus for pasta flour
Cleanliness	Domestic wheat has a high content of non-millable material
Least important:	
Availability of credit	Tunisia has sufficient foreign exchange reserves and prefers to obtain better price rather than concessional credit
Dockage	Used to be a problem with U.S. wheat, but has been satisfactory for past few years
Non-wheat material	European wheat sometimes contains feed wheat, while U.S. wheat may contain corn or garlic

The basic rule of thumb for Tunisian imports is that, for all offers meeting the minimum quality requirements, the contract will be awarded to the lowest-priced bid. In fact, it may very well be that a bid not meeting minimum specifications will be accepted if the price reduction is sufficient. Tunisian millers feel that the Office often loses money by accepting these lower quality bids, although the Office maintains that it never accepts bids for wheat not meeting minimum specifications. Some millers state that they would be willing to purchase higher quality wheat imports (such as No. 1 U.S. wheat) if they were free to import directly, as the net benefits in terms of milling yield and quality merit the price difference.

Supplier Performance

Tunisian wheat is identified as the highest quality wheat in terms of protein and moisture content. U.S. wheat is generally considered to be the least desirable in terms of the content of shrunken and broken kernels and its dark color (with the exception of pasta manufacturers). U.S. hard red wheat is highly appreciated for its protein content and test weight characteristics. European wheat is considered to be the poorest quality for moisture, protein content, and sprouted grains, as well as the dough elasticity (measured by the "W" factor). Personnel at the Office indicated in interviews that Tunisia no longer imports U.S. soft wheat due to its low dough elasticity or W rating.

While price may be the most important non-quality factor for the Office, the millers indicated other non-quality factors, which, in the event that the grain market is liberalized, may influence their choice of suppliers. The extension of credit could be an important transaction feature, particularly if the millers can sell to their clients only by offering credit, which is the case for Algerian flour importers.

Importance of Specific Quality Factors

Although the millers and the Office have not achieved consensus on quality issues, most persons interviewed appeared to agree that protein, moisture content, and dough elasticity (the W factor) are the three most important quality criteria. Wholesomeness of the grain appears to be a difficulty primarily with domestic grain, although dockage, corn, and garlic content used to present problems with U.S. grain imports.

Quality Problems

Millers interviewed expressed considerable reservations about certain quality attributes of European wheat, notably the moisture content and protein level (table 9). Tunisian millers generally prefer to mix domestic wheat with imported wheat, although domestic wheat is available only in limited quantities and over a relatively short period during the year. Among the various supplier countries, the United States generally appears to be the preferred source of wheat imports.

Table 9--Tunisia: Summary of quality concerns and contract specifications

Quality concern and specification	Nature of concern
Quality concerns:	
Most important--	
Protein content	High protein content needed for better quality flour
Moisture	High moisture increases difficulties with milling
W factor	For bread baking qualities
Moderately important:	
Color	Darker color wheat may be preferable for pasta, not for bread flour
Cleanliness	Higher cleaning costs
Least important--	
Dockage	Has been problem in past with U.S. wheat, now usually below 1%
Non-wheat material	Common in domestic wheat, has occurred with U.S. wheat
U.S. wheat contract specifications:	
Grade	U.S. Grade No. 2 or better, HRW/NS-DNS
Moisture content maximum	13.5%
Protein content minimum	12%
Diseased kernels maximum	0.5%
Dockage maximum	0.8%

Tunisian millers indicated that while most grain shipments are consistent in quality within one load, there may still be variations in quality as the storage system is inadequate and often requires mixing of grains from different shipments and/or storing grain in silos which have not been cleaned between loads. Quality variations within one shipment are thus beyond the control of wheat exporters. Some millers expressed concern about variations in the quality of U.S. wheat between shipments, which they feel are often seasonal in nature. Some said that shipments in early 1992 appeared to be from the "bottom of the silo."

The Office inspects imported wheat upon arrival in Tunisia. Technicians of the Office take samples using the "pelican"[5] method and conduct tests including: test weight, protein, moisture, dockage, radioactivity, and phytosanitary conditions. Millers conduct the same tests once they have purchased the wheat from the Office (often obtaining divergent results, they claim), as well as additional tests, such as for: gluten, color, ash content, water absorption, and impurities. These results are shared with other participating millers and may be used in preparing an optimal wheat mix for flour and in informing their clients about quality parameters of the flour. Only two or three mills have sophisticated laboratories, and some millers simply rely on the knowledge and experience of their head miller who can visually inspect and thus "grade" the grain.

Contract Specification of Quality Preferences

Contract specifications for imported wheat vary by country of origin and are indicated on the call for bids. U.S. wheat specifications are understood as being supplemental to those imposed for all wheat imports and are as follows:

- U.S. No. 2 or better (according to standards established by USDA/FGIS on 5/1/88); HRW/NS-DNS;
- Maximum moisture content of 13.5 percent;
- Minimum protein content of 12 percent;
- Maximum content of diseased ("fusariés") kernels of 0.5 percent
- Maximum dockage 0.8 percent.

The U.S. moisture content is somewhat lower than that of non-U.S. wheat (14 percent) and certain limits to U.S. wheat, such as dockage, are not specified for non-U.S. shipments.

Non-grade factors included in the purchase requirements for U.S. wheat include dockage and participation in U.S. export programs. Dockage is specified at a maximum of 0.8 percent, and the call for bids also indicates that the wheat should be sold under the EEP program.

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[5] An officially approved sampling device swung or pulled through a stream of grain. The pelican is a leather pouch attached to a long pole.

Importance of Dockage

Until 1990-91, dockage was considered a major problem with U.S. wheat. Officials at the Office recalled receiving numerous complaints from industry members about the high dockage content of U.S. wheat. Millers and Office personnel remember the great dust clouds that would occur when U.S. wheat was unloaded at the dockside. Since the early 1990's, however, dockage is no longer a problem with U.S. wheat. Officials at the Office as well as the millers agreed that the level of dockage in U.S. wheat has been greatly reduced. Dockage in current shipments very rarely exceeds 1 percent. Current official specifications place the maximum dockage at 0.8 percent. Any dockage exceeding this level is deducted at par.

Costs and Returns of Cleaning

It was not possible to obtain information on the costs and returns of cleaning wheat in Tunisian mills. It was apparent, however, that the investment in cleaning machinery and the time and energy associated with the cleaning process represent a major cost to millers. It was also clear that the major difficulty with cleaning occurred with domestic wheat, which has a high content of non-millable material, as discussed above.

The value of millfeeds processed from millable foreign material in wheat is fixed by the government in Tunisia. Millers may sell this millfeed at a maximum price of 80 dinars/mt ($95/mt)[6] up from 65 dinars ($77/mt) in 1990. Millers usually can sell their millfeed at the maximum price, although heavy rainfalls may increase the competition between grass and millfeed and force millers to lower their price.

Neither the Office nor the millers feel that more U.S. wheat would be purchased at the same price if dockage levels were reduced, nor would a premium be paid for lower dockage, as users are satisfied with the current level. Dockage is thus no longer an issue with U.S. wheat. Indeed, a number of other issues, such as those relating to U.S. food aid policy, are of considerably greater concern in the wheat industry in Tunisia.

Trade Impacts of Quality Factors

Tunisia is planning considerable policy reforms in the coming years, including a gradual shift toward liberalizing the wheat market. The millers interviewed appear to welcome this change, and are poised to face free markets for their grain purchases as well as flour and semolina sales. Given that these millers would be able to directly import wheat under a liberalized grain market, their preferences would be important in forecasting the future for U.S. wheat in Tunisia. They expressed a preference for U.S. wheat, and indeed may purchase higher grades of U.S. wheat once they are free to make their own decisions.

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[6] January 1991 exchange rate was 0.84 dinar per U.S. dollar.

Conclusions

The field interviews in Tunisia revealed two major issues among the millers, which are particularly important as they look forward to operating under a liberalized wheat sector. One of these issues is the possibility of importing wheat for milling and re-export of the flour. This would help millers operate closer to full capacity and enable them to be more competitive, especially in a free-market scenario. The second major issue is that of increasing storage capacity in the Tunisian wheat sector. The government's panseasonal pricing policy has discouraged extensive private investment in storage, and the Office itself also operates under limited storage capacity. Increasing storage space would permit greater flexibility for the Office, and eventually the private sector, in the timing of their grain purchases and the mix of wheat used for different flours.

Agricultural policy reform in Tunisia is aimed at increasing liberalization and exposure to free market prices. While the Office may continue to subsidize domestic producer prices for wheat, relative prices may change and thus affect the decision as to what the "optimal" mix of wheat will be for Tunisian mills. Price will continue to be a primary factor in determining supply. Also, the extension of credit by wheat exporters could become more important if private firms were to import wheat directly.

If the wheat market is liberalized, it is also probable that buyers will become more responsive to the price differentials associated with quality variations, and may at times purchase higher quality wheat at higher prices, which could be a marked change from current import behavior. It should not be surprising to note that in a liberalized market where prices are freely set, buyers and sellers will be more sensitive to quality factors.

Quality, price, and credit (for private firms) programs will thus be important issues in determining the U.S. share of the Tunisian wheat market. As for U.S. food aid policies, the possibility of importing wheat for milling and re-exporting of the flour will also affect the level of U.S. wheat exports to Tunisia. Protein and moisture content are the highest priority quality features of wheat, and of greater importance than dockage, which is acceptable at current levels. While not a major market for U.S. wheat, Tunisia is estimated to have one of the world's highest per capita consumption of wheat. Furthermore, the Tunisian wheat market exemplifies the rapidly expanding markets in North Africa and the Middle East (due to increasing population and/or income) and thus may serve as an important "test case" for U.S. wheat markets in these regions.

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Glossary

Blending: The systematic combining of two or more lots or kinds of grains to obtain a uniform mixture to meet a desired specification.

C & f: Cost and freight to the designated delivery point, paid by the seller.

C.i.f.: Cost, insurance, and freight to the designated delivery point, paid by the seller.

Commodity Credit Corporation (CCC): An agency of the U.S. Department of Agriculture created in 1933 to carry out loan and storage operations as a means of supporting prices above the level that would have prevailed in a free market.

Cu-Sum: A set of rules established by FGIS, that exporters must follow when loading grain on ocean vessels. The rules control variability among sublots blended to meet contract grade limits.

Damaged grain: In U.S. grading standards, the term damage refers primarily to biological deterioration associated with discoloration. Physical damage (such as cut or broken kernels) is not included in U.S. grades but is included in the standards of some other countries.

Defects: Computed total amount of damaged kernels, foreign material, and shrunken and broken kernels.

Dockage: Nongrain material that can be readily removed by accepted screening devices.

Durum wheat: Very hard, high-protein wheat used in the production of semolina flour for pasta products.

Export Credit Guarantee Program (GSM-102): U.S. agricultural export promotion program that guarantees repayment of private, short-term credit for up to 3 years.

Export Enhancement Program (EEP): Program to help U.S. exporters meet competitors' prices in subsidized markets: Exporters are awarded cash payments, enabling them to sell certain commodities to specified countries at prices below the U.S. market price.

Extraction rate: The fraction of the wheat kernel that is converted into flour during the milling process.

Falling number test: A test used to measure sprout damage in wheat.

F.a.s.: Free alongside ship specifies that the seller delivers goods to the port elevator or dock at a specified location and the buyer pays for loading the ship and ocean freight.

Federal Grain Inspection Service (FGIS): An agency of the U.S.

Department of Agriculture that establishes grain standards and develops the technology to measure the factors contained in such standards. This agency also develops and publishes sampling and inspection procedures, evaluates and approves equipment, monitors inspection accuracy, and oversees mandatory export inspection of grain by agency or FGIS-licensed inspectors.

F.o.b.: Free on board specifies that the seller loads the ship or other conveyance at the specified delivery point with the buyer paying freight charges.

Foreign material: Nonwheat material of similar size and weight to wheat kernels.

Gluten: A tenacious, elastic protein substance found especially in wheat flour that gives cohesiveness to dough.

Grade: A number or letter designation assigned to grain based on an established set of criteria.

Grade factor or grade determining factor: Those characteristics of grain used to determine the numerical grade. The grade factor is based on quantitative limits (either maximums or minimums) placed on each factor for each grade.

Grain grades and standards: Specific standards of grain quality established to maintain uniformity of grains from different lots and permit the purchase of grain without the need for visual inspection and testing by the buyer.

Hard Red Spring wheat: Spring seeded; includes the following three subclasses: dark northern, northern, or red: This wheat is high in protein and has a vitreous endosperm, is used primarily to produce bread flour and is produced in the upper Great Plains.

Hard Red Winter wheat: Fall seeded; This wheat may be either dark hard, hard, or yellow hard, medium to high in protein, a vitreous endosperm, and used primarily to produce bread flour. It is produced in the lower Great Plains.

Hard wheat: A generic term applied to wheat with a vitreous endosperm suitable for making bread flour or semolina; yields coarse, gritty flour that is free-flowing and easily sifted; and flour consists primarily of regularly shaped particles of whole endosperm.

Impurities: Any nongrain material contained within a shipment that could hinder the processing of a grain or detract from its end value.

Intrinsic value or end-use value: Characteristics critical to the end-use of grain. These are nonvisual and can only be determined by analytical tests. For example, the intrinsic quality of wheat is determined by characteristics such as protein, ash, and gluten content.

Moisture content: The amount of water in grain; measured by the weight of water as a percentage of the total weight of the grain including water (wet basis) or total weight of the dry matter excluding water (dry basis).

Nongrade determining factor: Factors that influence the quality of grain but are not taken into account in the grading of grain. These factors must be reported as information whenever an official inspection is made.

Nonmillable material: All material that is not wheat, includes shrunken and broken kernels.

Physical quality: Grain characteristics associated with the outward appearance of the grain kernel, including kernel size, shape, color, moisture, damage, and density.

Premiums: Prices that exceed the base price offered for grains with higher quality characteristics than specified. Generally calculated for factors that increase the value of the grain in market channels.

Public Law 480 (PL-480): Common name for the Agricultural Trade Development Assistance Act of 1954, which seeks to expand foreign markets for U.S. agricultural products, combat hunger, and encourage economic development in developing countries.

Sanitary quality: Grain characteristics associated with cleanliness. They include the presence of foreign material that detracts from the overall value and appearance of the grain, including the presence of dust, broken grain, rodent excreta, insects, residues, fungal infection, and nonmillable matter.

Screenings: The material removed from grain by means of mechanical sizing devices; generally include broken grain as well as nongrain material removed on the basis of density or particle size with mechanical cleaners.

Semolina: A coarse separation of endosperm extracted from Durum wheat to make pasta.

Shrunken and broken kernels: All matter that passes through a 0.064 inch by 3/8 inch oblong-hole sieve.

Soft wheat: A general term describing wheat with a chalky endosperm suitable for making pastry flour; yields a very fine flour consisting of irregularly shaped fragments of endosperm cells that adhere and sift with difficulty.

Spring wheat: A general term for wheat that is grown in the spring and harvested in the summer or fall; It has a relatively high protein content and is used in bread flours.

Test weight: Weight per unit volume as measured in pounds per bushel as defined in the United States. Determined by weighing the quantity of grain required to fill a 1-quart container. The

international equivalent measure is kilograms per hectoliter (conversion factor 0.77).

Uniformity: Conformity within and between shipments for quality attributes; such as physical, milling, and baking performances.

Wheat middlings: Fine particles of the bran and the wheat kernel. Normally used for livestock feed.

White wheat: Fall or spring seeded; it includes four subclasses: hard, soft, club, western: It is soft or hard and low in protein and is used mainly for pastry flours and oriental noodles.

Winter wheat: A general category describing wheats that are sown in the fall, lie dormant in the winter, and are harvested the following spring or summer.

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