agribusiness handbook

# Sunflower Crude and Refined Oils

agribusiness handbook

# Sunflower Crude and Refined Oils

This handbook is part of a series of agribusiness manuals prepared by the FAO Investment Centre Division, in collaboration with FAO's Rural Infrastructure and Agro-Industries Division. It was prepared for the EBRD Agribusiness team, under the FAO/EBRD programme of cooperation. The production of the manuals was financed by FAO and by the EBRD multidonor Early Transition Countries Fund and the Western Balkans Fund. The purpose of this handbook is to help agribusiness bankers and potential investors in the Early Transition countries (ETCs) and the Western Balkan countries (WBCs) to acquire basic knowledge about the technical features of the sunflower seed sector and to become acquainted with recent economic trends in the sector around the world, with a special focus on the ETCs and the WBCs. This volume was prepared by Inna Punda, FAO Agribusiness Expert, and reviewed by Dmitry Prikhodko, Economist, FAO Investment Centre Division, as well as by members of the EBRD Agribusiness team. Electronic copies can be downloaded from www.eastagri.org, where a database of agribusiness companies, including sunflower seed processing companies that operate in the ETCs and the WBCs, is also available. Please send comments and suggestions for a future edition of the manual to TCI-Eastagri@fao.org.

Design and page layout Alberto Pedro Di Santo

## TABLE OF CONTENTS

## INTRODUCTION

The sunflower plant originated in western North America. It is thought to have been domesticated around 1000 B.C. by Native Americans. Spanish explorers brought the sunflower to Europe in 1510. However, it was not until the late 1800s, when the flower was introduced in the the Russian Federation, that the sunflower became a food crop. In 1860, Russian farmers made significant improvements in the way that the sunflower was cultivated. At that time, they became the world's largest producer of sunflower seeds.

Thousands of years ago, people in many regions began to process vegetable oils, utilizing whatever foodstuffs they had on hand to obtain oils for a variety of cooking purposes. Peoples of early civilizations learned to use the sun, a fire or an oven to heat oily plant products until the plants exuded oil that could then be collected. The Chinese and Japanese produced soy oil as early as 2000 B.C., while southern Europeans had begun to produce olive oil by 3000 B.C. In Mexico and North America, sunflower seeds were roasted and beaten into a paste before being boiled in water; the oil that rose to the surface was then skimmed off.

Sunflower *(Helianthus annuus)*

Sunflowers are botanically classified as *Helianthus annuus*. They are a large plant and are grown throughout the world because of their relatively short growing season. Domesticated sunflowers typically have a single stalk topped by a large flower. This is significantly different from the smaller, multiply branched wild sunflower. During the growing season, the individual flowers are each pollinated. Seed development then begins moving from the outer rim of the flower toward the centre. It generally takes 30 days after the last flower is pollinated for the plant to mature.

The sunflower plants reach various heights, but most are from 1.52–2.1 m tall. The diameter of the flower heads is relatively large, typically between 7.62 and 15.24 cm, although some can measure more than 30 cm. An exception is the dwarf varieties, which are only 0.91–1.22 m high and have smaller flower heads. A common characteristic of sunflowers is a tendency for their flowering heads to follow the movement of the sun during the day. This phenomenon, called heliotropism, has the benefit of reducing damage from birds and preventing the development of disease.

## 1.1 Key production parameters

- Sunflowers are grown in warm to moderate semi-arid climatic regions of the world from Argentina to Canada and from central Africa to the Commonwealth of Independent States.
- Frost will damage sunflowers at all stages of growth. The plant grows well within a temperature range of 20–25 °C; temperatures above 25 °C reduce yields and oil content of the seeds.
- Plants are drought-resistant, but yield and oil content are reduced if they are exposed to drought stress during the main growing and flowering periods. Sunflowers will produce moderate yields with as little as 300 mm of rain per year, while 500–750 mm are required for better yields.
- Sunflowers adapt to a wide variety of soils, but perform best on good soils suitable for maize or wheat production.
- Sunflower seed plant density of 5–8 plants per 1 $m^2$ is required to form the optimum leaf area for plant photosynthesis. Kernel weight (40–80 g per 1,000 kernels) and the average number of kernels in a sunflower head (1,200–1,500) are the other most important yield components.
- Sunflower growth depends more on nitrogen than any other nutrient. Due to its deep rooting system, sunflower is able to use nitrogen from soil layers that are inaccessible to wheat, corn or other field crops. The plant requires a maximum of 150 kg of nitrogen per hectare to produce a 3 ton/ha yield. Over fertilization may lead to sunflower lodging. Phosphorous, potassium, boron, magnesium and molybdenum are also needed to achieve the best yields.
- The average fatty acid composition of oil from temperate sunflower crops is 55–75% linoleic acid and 15–25% oleic acid. Protein content is 15–20%.
- Planting in the Western Balkan countries, Eastern Europe and countries of the Former Soviet Union takes place during March and April.
- Sunflower has one of the shortest growing seasons of the major cash crops of the world. Early maturing varieties are ready for harvesting 90 to 120 days after planting, and late maturing varieties 120 to 160 days after planting. Delayed harvesting causes unwelcome changes in oil quality, with an increase in free fatty acid content. The seeds are ready to harvest when the heads turn black or brown and the seed moisture content reaches 10–12%. Grain combines are fairly easily adapted for the harvesting of sunflowers by the addition of a head snatcher.
- Depending on climatic and cultivation conditions, yields can vary from as much as 600 to 3,000 kg/ha; irrigation is a key factor for obtaining high yields.

**Table 1: Area harvested (thousand ha) and yields (kg/ha) in the top-producing countries**

| Country | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Area | Yield | Area | Yield | Area | Yield | Area | Yield | Area | Yield |
| ■1 Russian Federation | 4,883 | 998 | 4,709 | 1,020 | 5,411 | 1,190 | 5,943 | 1,136 | 5,003 | 1,131 |
| ■2 Ukraine | 3,810 | 1,117 | 3,427 | 890 | 3,689 | 1,276 | 3,912 | 1,361 | 3,411 | 1,224 |
| ■3 Argentina | 2,325 | 1,598 | 1,835 | 1,722 | 1,923 | 1,904 | 2,167 | 1,735 | 2,351 | 1,488 |
| ■4 India | 2,004 | 464 | 2,161 | 549 | 2,340 | 615 | 2,118 | 580 | 1,880 | 778 |
| ■5 China | 1,173 | 1,486 | 935 | 1,660 | 1,020 | 1,890 | 1,030 | 1,796 | 1,020 | 1,765 |

*Source: FAOSTAT. © FAO Statistics Division, 2009*

## 1.2 Total world production and main producers

Out of the total global production of oilseeds (404 million tons in 2008/2009), sunflower seed represents only 8%. The greatest seed production is of soybean (55%), followed by rapeseed (14%) and cottonseed (10%)[1].

In 2008/2009, about 33 million tons of sunflower seeds were harvested around the world (+23% against 2007/2008).

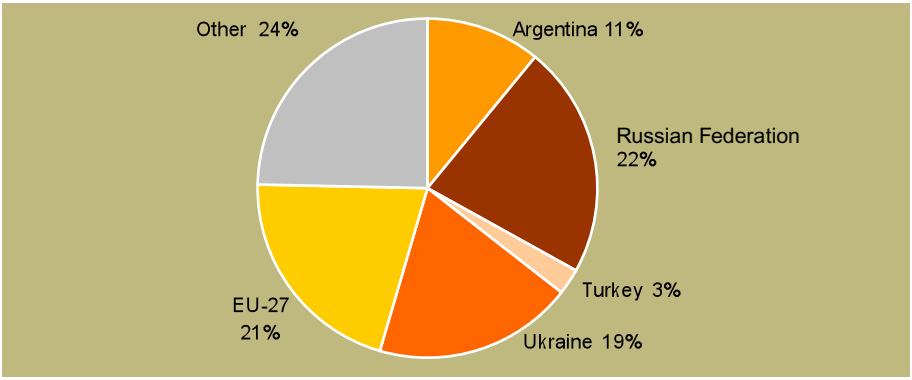
**Table 2: Sunflower seed production (thousand tons)**

| Production | Marketing year | Sunflower seed | | |
|---|---|---|---|---|
| | | 2006/2007 | 2007/2008 | 2008/2009 |
| Russian Federation | (Sep.–Aug.) | 6,750 | 5,650 | 7,400 |
| EU-27 | (Oct.–Sep.) | 6,502 | 4,771 | 6,950 |
| Ukraine | (Sep.–Aug.) | 5,300 | 4,200 | 6,300 |
| Argentina | (Mar.–Feb.) | 3,500 | 4,650 | 3,630 |
| Turkey | (Sep.–Aug.) | 850 | 700 | 850 |
| Other | | 6,910 | 7,225 | 8,291 |
| **World total** | | **29,812** | **27,196** | **33,421** |

*Source: FAO data*

[1] *Oil World, 2009.*

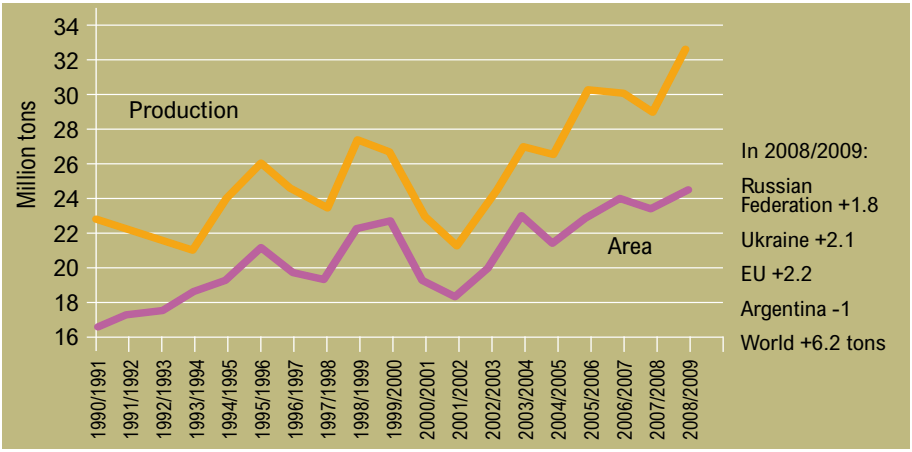
**Figure 1: Main producing countries and their share in world output of sunflower seed**




*Note: 2008/2009 data based on the figures presented in Table 2.*
*Source: FAO data*

Record sunflower seed crops were harvested in the European Union (EU) (mainly Hungary), the Russian Federation and Ukraine (Figure 2). Crop yields in these countries were buoyed by dry and mild harvest weather. Also higher plantings (encouraged by high prices) have an impact on larger harvest (or improved output). The additional supplies of sunflower seed resulted in an increase in seed crushing activity (to produce oil and meal) to above or near historic highs in each of these countries.

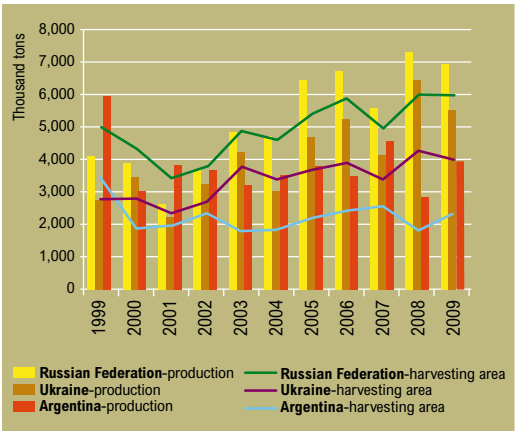
**Figure 2: Sunflower seed world output (in million tons) and area harvested (million ha)**

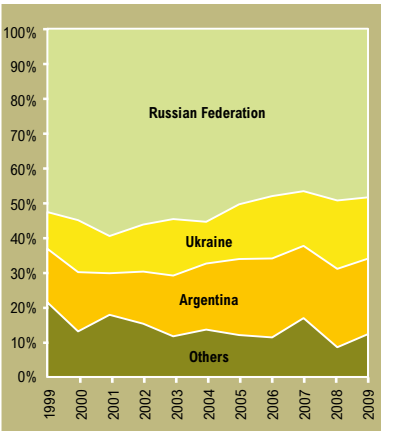



*Source: Oil World, 2009*

The Russian Federation, Ukraine and Argentina are the main world producers of sunflower seed and sunflower by-products, as well as suppliers to the global market. These three countries produce over the half of the sunflower seed in the world, which is why these three countries are often referred as the "sunflower triangle". The change in the market situation of one country has a great influence on the market situation in the other two countries, and affects the world market of sunflower seeds and sunflower by-products.

### Figures 3 and 4: Dynamics of sunflower seed production in the Russian Federation, Ukraine and Argentina and their share in world output of sunflower seeds




*Source: APK-Inform and AGRO-T.E.C.E.I, 2009*

### Table 3: Sunflower seed supply and demand (million tons)

| | 2008/2009* | 2007/2008 | 2006/2007 | 2005/2006 | 2004/2005 |
|---|---|---|---|---|---|
| **Opening stocks** | **2.05** | **1.65** | **2.44** | **2.23** | **2.14** |
| **Production** | **32.62** | **28.95** | **30.08** | **30.28** | **26.39** |
| EU-27 | 6.72 | 4.94 | 6.41 | 5.72 | 6.30 |
| Russian Federation | 6.95 | 5.50 | 6.35 | 6.44 | 4.80 |
| Ukraine | 6.30 | 4.75 | 5.55 | 4.95 | 3.28 |
| United States | 1.55 | 1.31 | 1.00 | 1.72 | 0.93 |
| Argentina | 2.50 | 4.40 | 3.12 | 3.84 | 3.73 |
| Turkey | 0.85 | 0.67 | 0.82 | 0.78 | 0.64 |
| **Total supplies** | **34.67** | **30.6** | **32.52** | **32.51** | **28.53** |

| | 2008/2009* | 2007/2008 | 2006/2007 | 2005/06 | 2004/2005 |
|---|---|---|---|---|---|
| **Disappearance** | **32.36** | **28.55** | **30.87** | **30.07** | **26.3** |
| Crush (Sep./Aug.) | 28.66 | 24.92 | 27.39 | 26.57 | 23.01 |
| | | | | | |
| **Ending stocks** | **2.31** | **2.05** | **1.65** | **2.44** | **2.23** |
| EU-27 (July 31) | 0.58 | 0.29 | 0.53 | 0.47 | 0.44 |
| Argentina (Sep. 30) | 0.64 | 1.09 | 0.6 | 0.86 | 0.98 |
| | | | | | |
| **Stock/usage** | **7.1%** | **7.2%** | **5.3%** | **8.1%** | **8.5%** |

** Forecast.*
*Source: Oil World, 2009*

## 1.3 Key production costs and margins

Based on the assumption that the yields are 2 tons per hectare and the price is USD 332 per ton (ex-farm, United Kingdom), the following costs should be considered:

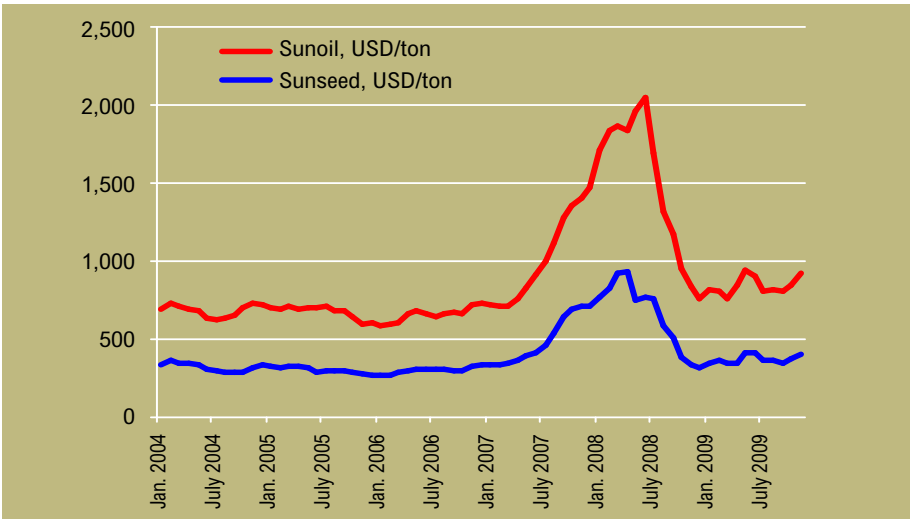
| Costs | USD/ha |
|---|---|
| Output | 664 |
| Variable costs: | |
| seed | 178 |
| fertilizer | 91 |
| sprays (*) | 62 |
| Total variable costs | 331 |
| **Gross margin per ha** | **333** |

*(*) Note: Drying costs can be very high; therefore, farmers may choose spaying to defoliate sunflower plants before harvesting.*
*Source: FARM Management Pocketbook, John Nix. 38th edition, 2008*

## 1.4 Sunflower seed sale prices

As with many other commodity markets, the global financial crisis seriously affected oilseed farmers, traders and processors through lower liquidity and increased cost of financing. After the extraordinary rise of sunflower seed prices in the spring of 2008 due to a poor sunflower seed crop in 2007 and overall global agricultural commodity price increases, sunflower seed prices started declining as crop production fully recovered in 2008.

**Figure 5: Correlation between sunflower seed prices and sunflower oil prices**




*Note: Oil prices are f.o.b. North West European Ports; seed prices are CIF Lower Rhine, EU.*
*Source: Oil World, 2009*

## 1.5 International trade in sunflower seed

Overall trade is affected by a further drawdown in exporting countries' inventories and by increased reliance on the three major suppliers, Argentina, Ukraine and the Russian Federation.

On the **export** side, in 2008/2009 the total volume of sunflower seed traded reached almost **2 million tons** (+39% compared with the previous year – see Table 4).

**Table 4: Sunflower seed exports (thousand tons)**

| Country/region | Marketing year | Sunflower seed | | |
|---|---|---|---|---|
| | | 2006/0207 | 2007/2008 | 2008/2009 |
| Ukraine | (Sep.–Aug.) | 336 | 75 | 450 |
| EU-27 | (Oct.–Sep.) | 749 | 500 | 400 |
| Russian Federation | (Sep.–Aug.) | 162 | 37 | 250 |
| Argentina | (Mar.–Feb.) | 57 | 40 | 95 |
| Turkey | (Sep.–Aug.) | 2 | 0 | 3 |
| Other | | 565 | 765 | 777 |
| **World total** | | **1,871** | **1,417** | **1,975** |

*Source: FAO data*

According to industry sources, the three countries have export restrictions for the oilseeds: Ukraine has 13 % export duties for sunflower seed; sunflower seed export duties in The Russian Federation total 20 % (but not lower than 30 Euro/ton); and Argentina has 30 %.

**Imports** of sunflower seed reached 1.6 million tons in 2008/09 (+46 % against the previous year – see Table 5).

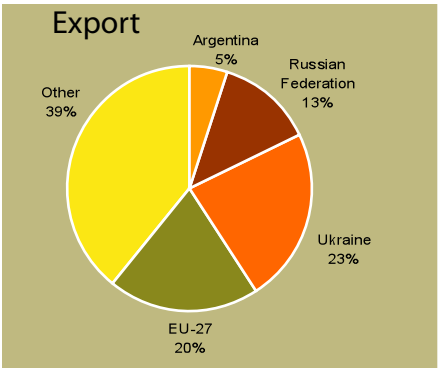
**Table 5: Sunflower seed imports (thousand tons)**

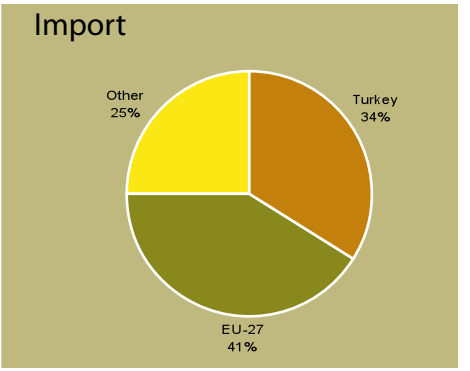
| Country/region | Marketing year | Sunflower seed | | |
|---|---|---|---|---|
| | | 2006/2007 | 2007/2008 | 2008/2009 |
| EU-27 | (Oct.–Sep.) | 570 | 300 | 650 |
| Turkey | (Sep.–Aug.) | 439 | 529 | 550 |
| Argentina | (Mar.–Feb.) | 26 | 20 | 20 |
| Russian Federation | (Sep.–Aug.) | 10 | 11 | 10 |
| Ukraine | (Sep.–Aug.) | 6 | 8 | 5 |
| Other | | 632 | 233 | 373 |
| **World Total** | | **1,683** | **1,101** | **1,608** |

*Source: FAO data*

Argentina, Ukraine and the Russian Federation account for 52% of the world production of sunflower and 40% of world exports of sunflower seeds. Due to geographical location, harvesting of sunflower in Argentina (and accordingly the beginning of its export season) coincides with the periods of supply decrease in the Russian Federation and Ukraine (see Table 5 for country-specific marketing years). Competition among these countries on the world market has a seasonal character.

**Figures 6 and 7: Global export/import distribution of sunflower seed**




*Source: FAO estimates*

Sunflower seeds are four-sided and flat, and are generally 0.6 cm long and 0.3 cm wide. They have a black seed coat with dark or grey stripes. The coat, or hull, surrounds a small kernel that is composed of about 20% protein and 30% lipids. Additionally, the seed contains a high level of iron and dietary fibre. The high linoleic acid content of the kernel makes it prone to rancidity, thus giving it a limited shelf life.

Sunflowers are used to make oil, meal and confectionary products. Oil and meal are processed from the same sunflower seed varieties. The seed variety used foe confectionary products has a lower percentage of oil. The seed is usually black with white stripes and is larger than the seed cultivated for oil extraction; the hull is heavier and less firmly attached to the kernel, and its oil content rarely exceeds 35%.

Sunflower oil is extracted mainly from oil-type sunflower seed varieties and hybrids. Meal, a by-product of the oil extraction process, is used primarily as an ingredient in livestock feed rations. Compared with soybean meal, sunflower meal has a lower percentage of protein (28%)[2]. However, more than 80 % of a sunflower's value comes from oil (see Figure 11). Oil-type sunflower seeds contain 38–50% oil and about 20% protein. The crushing process removes the hulls from the seeds, and the hulls can be used to generate steam to power the crushing plant. For every 100 kg of seed, about 40 kg of oil, 35 kg of high-protein meal and 20-25 kg of by-products are produced. More than 90% of the sunflower seeds produced are processed into edible oil.

## 2.1 Sunflower seed processing into oil

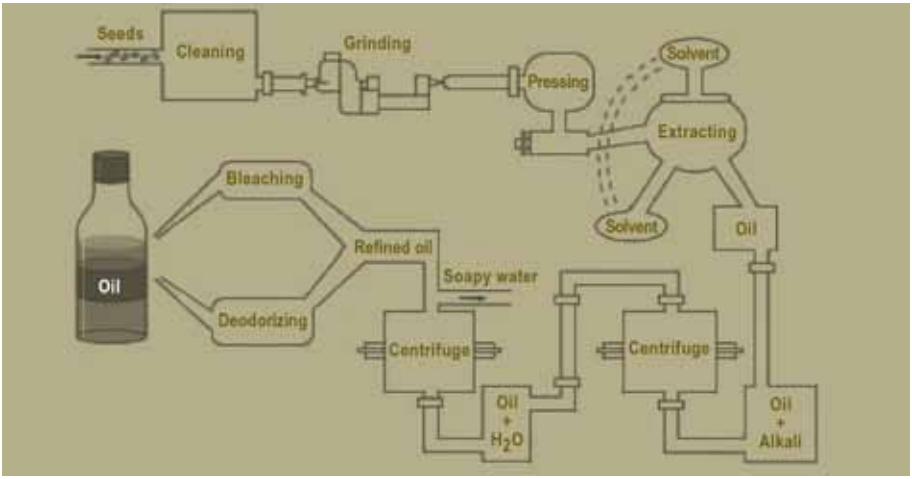
Sunflower oils are cold-pressed. This method, which entails minimal processing, produces a light, flavourful oil suitable for some cooking needs.

Sunflower oil manufacture involves cleaning the seeds, grinding them, pressing and extracting the crude oil from them, and further refining. In extracting the oil, a volatile hydrocarbon[3] such as hexane is used as a solvent to extract the oil.

[2] *Agricultural Marketing Resource Center, AgMRC*

[3] *Volatile hydrocarbons are hydrocarbons that are liquid at normal pressure and temperature but have a high vapour pressure and, therefore, evaporate rapidly. Some examples of volatile hydrocarbons include toluene, methylene chloride and acetone.*

**Figure 8: Sunflower oil manufacturing process**




*Source: www.madehow.com*

- **Cleaning and grinding**
  Incoming oil seeds are passed over magnets to remove any trace of metal before being de-hulled. The de-hulled seeds are then ground into coarse meal to provide more surface area to be pressed. Mechanized grooved rollers or hammer mills crush the material to the proper consistency. The meal is then heated to facilitate the extraction of the oil. While this procedure allows more oil to be pressed out, more impurities are also released with the oil, and these must be removed before the oil can be deemed edible.

- **Pressing**
  The heated meal is then fed continuously into a screw press, which increases the pressure progressively as the meal passes through a slotted barrel. Pressure generally increases from 68,950 to 206,850 kilopascals as the oil is squeezed out through the slots in the barrel, and is recovered.

- **Extracting additional oil with solvents**
  After the oil has been recovered from the screw press, the oil cake remaining in the press is processed by solvent extraction to attain the maximum yield. A volatile hydrocarbon (most commonly hexane) dissolves the oil out of the oil cake, is then distilled out of the oil and passes through the matter, to be collected at the bottom.

- **Removing solvent traces**
  Ninety percent of the hydrocarbon remaining in the extracted oil simply evaporates, and, as it does, it is collected for reuse. The remaining

hydrocarbon is retrieved with the use of a stripping column. The oil is boiled by steam, and the lighter hexane floats upward. As it condenses, it too is collected.

- **Refining the oil**
  The oil is next refined to remove colour, odour, and bitterness. Refining consists of heating the oil to between 40 and 85 °C and mixing an alkaline substance such as sodium hydroxide or sodium carbonate with it.

  Oils are also degummed at this time by treating them with water heated to between 85 and 95 °C steam, or water with acid. The gums, most of which are phosphatides, precipitate out, and the dregs are removed by centrifuge.

  Oil that will be heated (for use in cooking) is then bleached by filtering it through fuller's earth, activated carbon, or activated clays that absorb certain pigmented material from the oil. By contrast, oil that will undergo refrigeration (because it is intended for salad dressing, for example) is winterized – rapidly chilled and filtered to remove waxes. This procedure ensures that the oil will not partially solidify in the refrigerator.

  Finally, the oil is deodorized. In this process, steam is passed over hot oil in a vacuum at between 225 and 250 °C, thus allowing the volatile taste and odour components to distil from the oil. Typically, citric acid at 1% is also added to oil after deodorization to inactivate trace metals that might promote oxidation within the oil and hence shorten its shelf-life.

- **By-products/waste**
  The most obvious by-product of the oil-making process is oil seed cake. Most kinds of seed cake are used to make animal feed and low-grade fertilizer; others are simply disposed of.

- **Quality control**
  The seeds used to make oil are inspected and graded after harvest, and the fat content of the incoming seeds is measured. For the best oil, the seeds should not be stored at all, or for only a very short time, since storage increases the chance of deterioration due to mould, loss of nutrients and rancidity. Quality of seeds very much depends on infrastructure (silos) available for the proper storage conditions. The seeds should be stored in well-ventilated warehouses with a constantly maintained low temperature and humidity. Pests should be eradicated, and mould growth should be kept to a minimum. Seeds to be stored must have a low moisture content (around 10%), or they should be dried until they reach this level (dryer seeds are less likely to encourage the growth of mould).

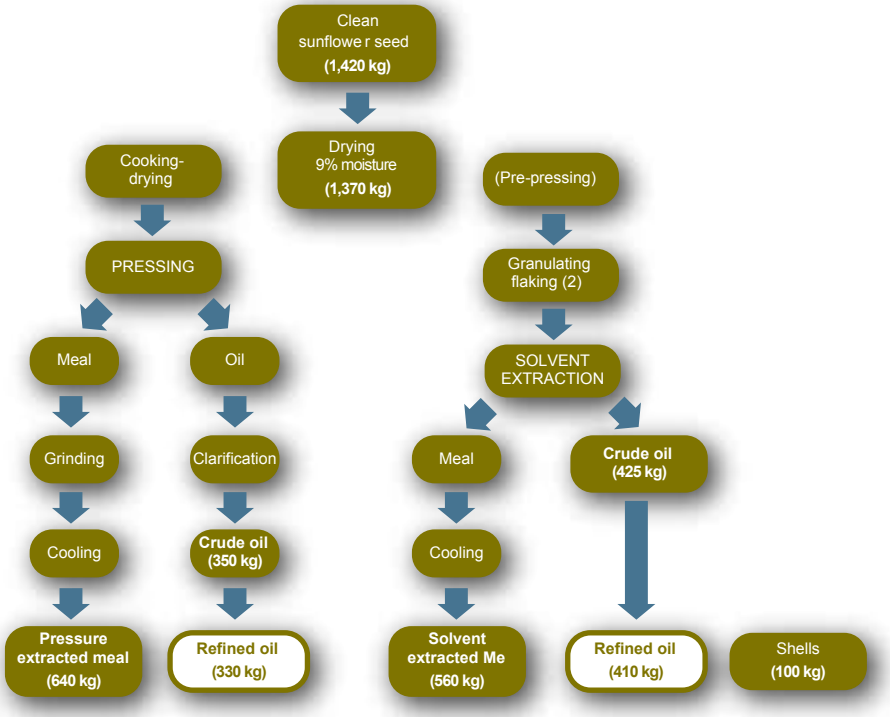
Processed oil should be consistent in all aspects such as colour, taste and viscosity. In addition, the oil should be free of impurities and meet the demands placed upon it for use in cooking.

Before being filled, the bottles that hold the oil are cleaned and electronically inspected for foreign material. To prevent oxidation of the oil (and therefore its tendency to go rancid), the inert (non-reactive) gas nitrogen is used to fill up the space remaining at the top of the bottle.

## 2.2 Conversion factors from raw material

The following figure illustrates the average processing conditions in the EU for seeds with an oil content of 44%.

**Figure 9: Sunflower seed processing into oil, with conversion factors**




*(1) Shelling is optional. When carried out, only one-half of the shells can be removed, which implies a loss in weight of 10%.*
*(2) Granulating or flaking are optional.*
*Source: FAO*

## 2.3 Oil composition and physical properties

Sunflower oil contains predominantly linoleic (48–7%), oleic (14–40%), palmitic (4–9%) and stearitic (1–7%)

There are several types of sunflower oils produced, such as high linoleic, high oleic and mid oleic. High linoleic sunflower oil typically has at least 69% linoleic acid. High oleic sunflower oil has at least 82% oleic acid. The variation in the unsaturated fatty acids profile is strongly influenced by both genetics and climate. In the last decade, high stearic lines of sunflower oil have been developed in Spain to avoid the use of hydrogenated vegetable oils in the food industry.

The conventional sunflower oil (high linoleic) is used for home cooking oil and margarine and for industrial use (paint, etc). The high oleic sunflower oil is used for cosmetics, gasoline blend and other purposes.

Sunflower oil also contains lecithin, tocopherols, carotenoids and waxes. Sunflower oil's properties are typical of a vegetable triglyceride oil. It is light in taste and appearance and has a high vitamin E content. The refined oil is clear and slightly amber-coloured with a slightly fatty odour. Sunflower oil is liquid at room temperature and has the following characteristics:

- smoke point (refined): 232 °C
- smoke point (unrefined): 227 °C
- density (25 °C): 917 kg/m$^3$
- refractive index (25 °C): ≈1.473
- viscosity (25 °C, unrefined): 0.04914 kg/(M*S)

## 2.4 Key processing costs and margins

Capital investment in an oilseed crushing plant varies from USD 22,000 to 33,000 and is on average USD 27,000 per 1 ton of daily capacity. This is valid for the facilities with daily capacity of 1,000–3,000 tons.

The breakdown of capital investment costs is as follows:

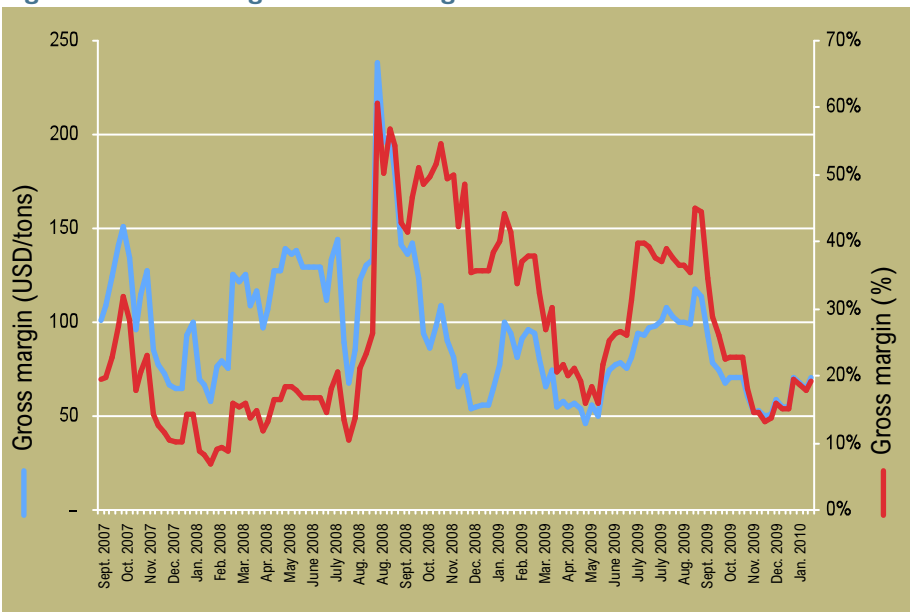
| | |
|---|---|
| Total equipment costs | 37.5 % |
| main equipment | 30.0 % |
| supporting equipment | 1.5 % |
| instruments | 16.7 % |
| transport | 3.3 % |
| Building and storage facilities | 12.5 % |
| Communications | 3.5 % |

| | |
|---|---|
| Construction infrastructure | 4.5 % |
| Mechanical works | 6.5 % |
| Pipelines and protection surfaces | 6.0 % |
| Electric works and devices | 7.5 % |
| Land | 2.5 % |
| Maintenance and logistics | 1.5 % |
| Feasibility study and design | 10.0 % |
| Permits, licensing, etc. | 1.0 % |
| Contingencies | 7.5 % |

*Source: Chapter 26 in the Practical Handbook of Soybean Processing and Utilization. David R. Erickson, et al. 2002*

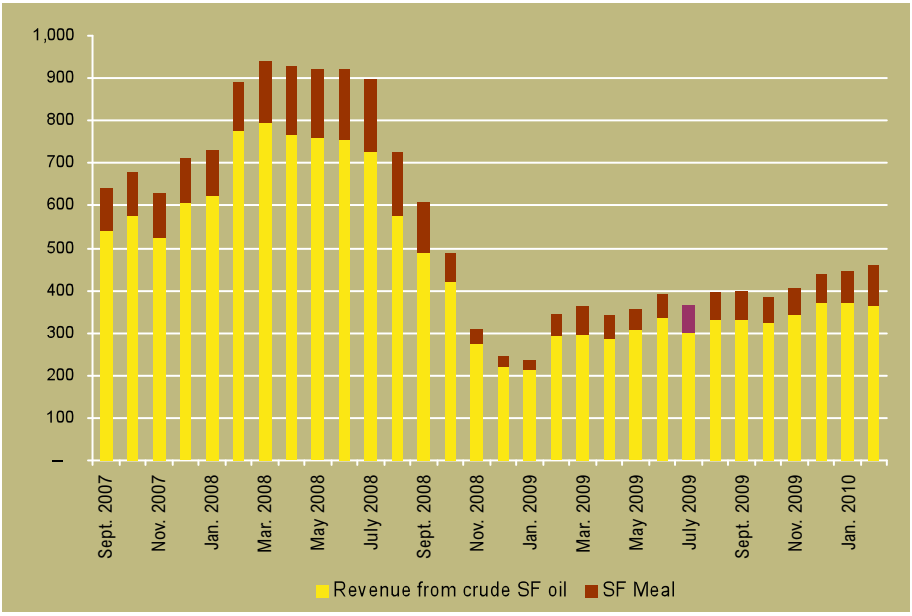
Variable costs can range from USD 14.75–22.10 per ton and average USD 16.50.

**Figure 10: Gross margin from crushing of 1 ton of sunflower seeds**




*Source: Author's calculation based on APK Inform data*

**Figure 11: Contribution of crude sunflower oil and sunflower meal to the gross margin from sunflower seed crushing (USD)**




*Source: Calculation based on APK Inform data*

## 2.5 World production of sunflower oil and main producing countries

Worldwide, the levels of sunflower seed production and prices are interrelated to, and determinant of, sunflower oil production levels and prices. Thus, the production capacity of sunflower seeds highly affects the development of the processing industry.

The world supply of sunflower seed oil for 2008/2009 is estimated at 11.7 million tons (+18% compared with the previous marketing year). The 2008/2009 crop translates into record sunflower seed oil production (in contrast with a decline in soybean oil production).

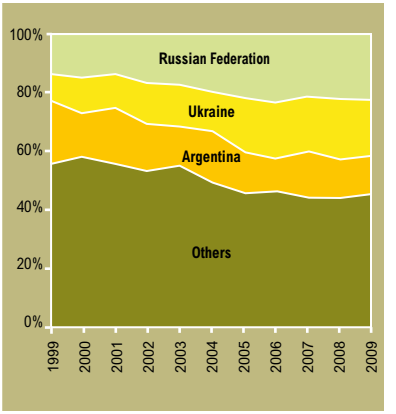
**Table 6: Sunflower seed oil global production (thousand tons)**

| Country/region | Marketing year | Sunflower seed oil | | |
|---|---|---|---|---|
| | | 2006/2007 | 2007/2008 | 2008/2009 |
| Russian Federation | (Sep.–Aug.) | 2,465 | 2,130 | 2,520 |
| Ukraine | (Sep.–Aug.) | 2,050 | 1,726 | 2,285 |
| EU-27 | (Oct.–Sep.) | 2,200 | 1,773 | 2,270 |
| Argentina | (Mar.–Feb.) | 1,202 | 1,800 | 1,785 |
| Turkey | (Sep.–Aug.) | 525 | 523 | 544 |
| Other | | 2,172 | 1,958 | 2,270 |
| **World total** | | **10,614** | **9,910** | **11,674** |

*Source: FAO internal data*

Typically, the leading countries in sunflower seed production are also leaders in sunflower oil production. However, Turkey, which is not among the top producers of sunflower seeds, is the fourth sunflower oil-producting country in the world – the domestic industry is fuelled by large imports of raw materials. Turkey imports seeds and processes them into oil (Table 6).

**Figures 12 and 13: Dynamics of production and exports of sunflower oil in the Russian Federation, Ukraine and Argentina and their share of world output of sunflower oil**


*Source: APK-Inform and AGRO-T.E.C.E.I*

The world's largest oil-processing companies are:

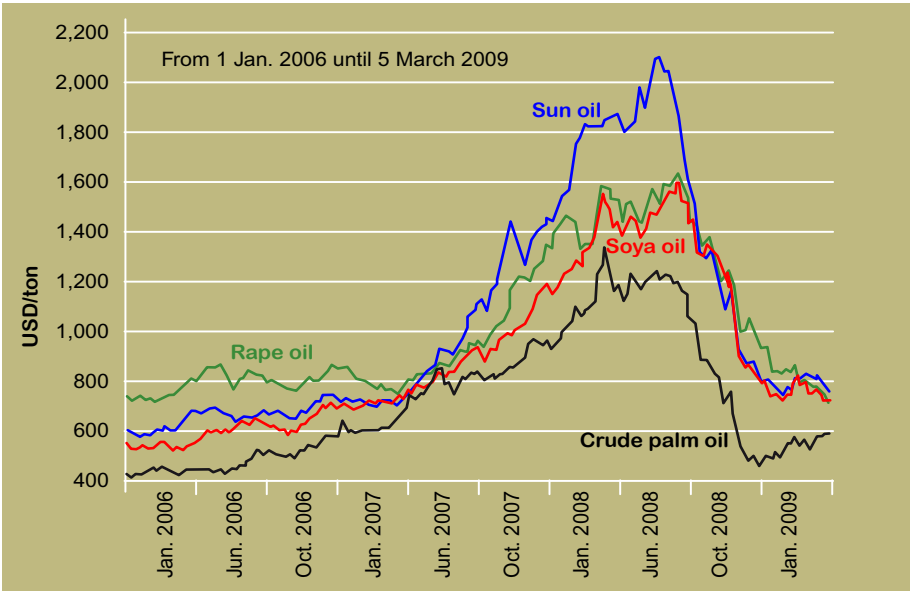
| | |
|---|---|
| ■ **1 Cargill**<br>www.cargill.com | Cargill is the United States' second-largest private corporation (after Koch Industries). Its diversified operations include grain, cotton, sugar, petroleum and financial trading; food processing; futures brokering; health and pharmaceutical products; agricultural services such as animal feed and crop protection; and industrial products including biofuels, oils and lubricants, starches and salt. The company is one of the leading grain producers in the United States, and its Excel unit is one of the top US meatpackers. Cargill's brands include Diamond Crystal (salt), Gerkens (cocoa), Honeysuckle White (poultry), Sterling Silver (fresh meats) and Nutrena (dog and cat food).<br>Cargill Grain & Oilseed Supply Chain consists of 13 business units that operate on an integrated global basis. The company sources, trades, processes and distributes grain and oilseeds. The main bulk products handled are wheat, corn, oilseeds, barley and sorghum, as well as vegetable oils and meals. |
| ■ **2 Bunge**<br>www.bunge.com | Bunge is an agribusiness and food company that is the largest producer of soybean oil and has an immense stake in the South American fertilizer market. It also deals with commodities and works a great deal with biofuels, especially Brazilian sugar-cane ethanol. Bunge trails its competitors Cargill and Archer Daniels Midland Company (ADM) in revenue and net sales but both of these competitors have been on a fairly consistent upward climb. Net sales in 2007 totalled USD 37.8 billion, compared with ADM's USD 36.6 billion and Cargill's USD 75.2 billion. Bunge operates approximately 50 processing facilities around the world. Bunge Limited was founded in 1818 and is headquartered in White Plains, New York. The company currently employs 24,800 people. |
| ■ **3 Archer Daniels Midland Company** (ADM)<br>www.adm.com | ADM is the third largest processors of oilseeds, corn, wheat and cocoa in the world, posting revenues of USD 69.8 billion for fiscal year 2008. It processes crops for food and biofuels. The company's Oilseeds Processing segment engages in processing oilseeds, such as soybeans, cottonseed, sunflower seeds, canola, rapeseed, pea nuts and flax seeds into vegetable oils and protein meals for the food and feed industries. The company was founded in 1898 and is based in Decatur, Illinois. Full-time employees number 28,200. |
| ■ **4 Louis Dreyfus Commodities**<br>www.louisdreyfus.com | Louis Dreyfus Commodities, consistently ranked among the largest merchants and distributors of oilseeds, and handles soybeans, canola, rapeseeds, sunflower seeds, flax, cotton and agricultural by-products. LDCommodities purchases oilseeds in all of the major production regions in the world, including the United States, Canada, Brazil, Argentina, Europe, South Africa and the states of the former Soviet Union. In addition, it is engaged in a large distribution network in Europe, Asia, Africa, the Middle East and the states of the former Soviet Union. Oilseed activities are directed by main offices in Beijing, Buenos Aires, Delhi, Geneva, Paris, São Paulo, Singapore and Wilton. |

Other big companies include Alfred Toepfer, (Germany, main shareholder is ADM), Peter Cremer (United States), Al Ghurair (United Arab Emirates), IFFCO (United Arab Emirates), EFKO (Russian Federation), Yug Rusi (Russian Federation), Allseeds Company (Ukraine) and Kernel Holding (Ukraine).

## 2.6 Sunflower oil prices

In 2007 and the first half of 2008, there was a drastic increase in sunflower oil prices, caused by the increase in seed prices due to a combination of factors, of which draught was a key factor. However, in the second half of 2008, prices started to fall drastically – prices in November 2008 were almost 30% lower than those of June 2008 (US export prices).

**Figure 14: Weekly oil prices in Rotterdam (USD/ton)**




*Source: Oil World, 2009*

The supply of sunflower oil in the Russian Federation, Ukraine and EU-27 increased in 2008-2009 as compared with the previous marketing year and resulted in a sunflower seed price decrease. General downward trends in the market of vegetable oils were also caused by a cut in prices for crude oil. Activation of sunflower oil trading was in the hands of the main exporting countries of sunflower oil – countries in the Black Sea region and Argentina. A big increase in exports from the Russian Federation and Ukraine is being observed, whereas despite increased demand, Argentina has lost its positions on the market due to lower production of sunflower seed in Argentina (by 38%) and ineffective public policy (export duties for grains, oilseeds and by-products).

According to FAO-OECD long-term projections (2009), vegetable oil production will increase from 112 million tons in 2008 to 155 million tons in 2018. The Russian Federation is forecast to increase its vegetable oil production (mostly sunflower seed) by 28% by 2018, while Ukraine is expected to increase production by 45% (based on OECD Stat, February 2010).

**Sunflower oil: food versus fuel**

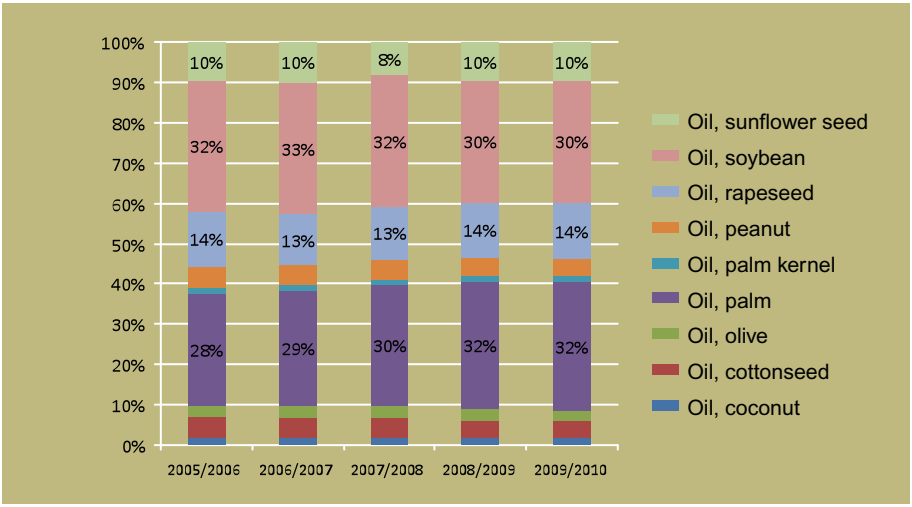
World consumption of biofuels is rapidly increasing: 0.37 million tons on average in 1991–1995; 1.03 million tons in 1996–2000; 3.04 million tons in 2001–2005; and a forecasted 12.6 million tons in 2006–2010. Global biodiesel production capacity increased from about 2 million tons in 2002 to the current 33 million tons (against only 11 million tons of actual output – 2008 data, Oil World).

Countries where the use of vegetable oils for biofuel is estimated to grow include Argentina, Brazil and countries of the EU.

## 2.7 Sunflower oil domestic use

Although the global market is smaller for sunflower seeds than for palm and soy oil, demand for sunflower seed oil will likely continue to increase as food processors search for sources of trans-fat-free vegetable oil (despite the higher cost of sunflower oil compared with other oils).

**Figure 15: Shares of major oils in global vegetable oil consumption**




*Source: Based on USDA data*

Sunflower oil accounts for 8% of the world consumption of vegetable oils, and 10% of global food consumption of vegetable oils. From 1999 to 2008, the world production of sunflower increased by 20%, whereas the production and consumption of sunflower oil increased by 25%, or 2.2 million tons per year.

The global market for sunflower oil, and vegetable oils on the whole, has been growing steadily, for food as well as feed purposes. The result is high investment attractiveness of the industry, which in turn has resulted in increased investment in sunflower seed crushing in Argentina, the Russian Federation and Ukraine.

## 2.8 International trade in sunflower oil

Sunflower oil trade reached a record level in 2008/2009 due to increased demand compared with the previous several seasons: the volume of sunflower oil traded globally reached 4 million tons, and imports reached 3.5 million tons (compared with 2.5 million tons in 2007/2008, see Table 7). This was despite rather high prices on sunflower oil.

The main factor for the increase in sunflower oil trading volumes was the growth in consumption due to the narrowed price difference between sunflower and other vegetable oils. This resulted in higher imports from important vegetable oil importers such as India and Iran.

**Table 7: Sunflower oil exports (thousand tons)**

| Country/ region | Marketing year | Meal, sunflower seed | | | Oil, sunflower seed | | |
|---|---|---|---|---|---|---|---|
| | | 2006/2007 | 2007/2008 | 2008/2009 | 2006/2007 | 2007/2008 | 2008/2009 |
| Ukraine | (Sep.–Aug.) | 1,483 | 1,273 | 1,620 | 1,867 | 1,325 | 1,580 |
| Argentina | (Mar.–Feb.) | 766 | 1,225 | 1,200 | 853 | 1,400 | 1,385 |
| Russian Federation | (Sep.–Aug.) | 866 | 666 | 800 | 711 | 322 | 670 |
| EU-27 | (Oct.–Sep.) | 146 | 48 | 148 | 147 | 113 | 115 |
| Turkey | (Sep.–Aug.) | 0 | 0 | 0 | 9 | 4 | 10 |
| Other | | 192 | 165 | 159 | 314 | 324 | 291 |
| **World total** | | **3,453** | **3,377** | **3,927** | **3,901** | **3,488** | **4,051** |

*Source: FAO data*

Ukraine, Argentina and the Russian Federation are the main sunflower oil exporters. In 2008/2009, these countries represented 56% of the global production of sunflower oil, and 86% of exports. Ukraine is the world's leader of sunflower oil exports (almost 40%), owing to competitive pricing and the devaluation of the national currency against the United States dollar. Argentina exports 34% and the Russian Federation 17%.

Due to high sunflower oil production and attractive sunflower oil prices, in 2008/2009 sunflower oil trade climbed to a record level: 3.5 million tons of oil were imported globally, a 43% increase over the previous marketing year. Declining freight rates and sunflower oil prices should encourage price-sensitive consumers who prefer sunflower oil to buy more sunflower oil than in 2007/2008. In addition, countries with developed storage facilities should be encouraged to replenish stocks from a low 2007/2008 carryover. The largest increase in sunflower seed oil imports is expected to take place in the EU-27, where trade is forecast to increase from about 1 million to 1.4 million tons.

**Table 8: Sunflower oil imports and main importers (thousand tons)**

| Country/ region | Marketing year | Meal, sunflower seed | | | Oil, sunflower seed | | |
|---|---|---|---|---|---|---|---|
| | | 2006/2007 | 2007/2008 | 2008/2009 | 2006/2007 | 2007/2008 | 2008/2009 |
| EU-27 | (Oct.–Sep.) | 1,774 | 1,552 | 1,750 | 1,205 | 991 | 1,370 |
| Turkey | (Sep.–Aug.) | 406 | 244 | 430 | 113 | 295 | 350 |
| Russian Federation | (Sep.–Aug.) | 30 | 15 | 20 | 115 | 144 | 90 |
| Argentina | (Mar.–Feb.) | 0 | 0 | 0 | 2 | 0 | 0 |
| Ukraine | (Sep.–Aug.) | 0 | 0 | 0 | 0 | 1 | 0 |
| Other | | 1,127 | 1,024 | 1,462 | 1,882 | 1,044 | 1,726 |
| **World total** | | **3,337** | **2,835** | **3,662** | **3,317** | **2,475** | **3,536** |

*Source: FAO data*

The EU is one of the world's largest importers of vegetable oils. A rise in imports will be required to satisfy internal demand for oil for food and, in particular, non-food (biofuel) purposes. This will increase demand for sunflower seed as more rapeseed is needed to produce bidiesel.

After almost ten years, India returned to the list of the world's largest importers – 14% of world imports of sunflower oil in 2008/2009. The reduction in prices for sunflower oil in the current season was highly appreciated by such important buyers as Iran. Deliveries of sunflower oil to this country in 2008/2009 increased nine times compared with the previous marketing year.

Turkey's position in the global market of sunflower oil is unique: the country is both a large importer and exporter. In 2008, Turkey imported more than 411,000 tons of sunflower oil, while exports totalled almost 100,000 tons. The main suppliers of sunflower oil to Turkey were Ukraine, Argentina and the Russian Federation; the main buyers of Turkish sunflower oil are neighbouring Iraq (48,000 tons) and Syria (23,000 tons).

Slower growth in imports in some countries (for example China) was the result of improved sunflower oil output from domestic sources and slower consumption growth.

# 3. SUNFLOWER SEED PRODUCTION AND PROCESSING IN THE WESTERN BALKAN COUNTRIES (WBCs) AND THE EARLY TRANSITION COUNTRIES (ETCs)

## 3.1 Production of sunflower seed in the WBCs and the ETCs

Sunflower cultivation is not largely developed in the Western Balkan countries (WBCs) and the Early Transition countries (ETCs) due to the strong tradition of olive cultivation (Albania) and cottonseed cultivation (Central Asia). Therefore, the WBCs and the ETCs that cultivate oilseeds often have large areas under cotton, rape and, to a lesser extent, safflower.

**Table 9: Regional production of major oilseeds, 2007 (tons)**

| Country | Linseed | Rapeseed | Safflower seed | Cottonseed | Sesame seed | Sunflower seed |
|---|---|---|---|---|---|---|
| Serbia | | 29,825 | | | | 294,502 |
| Republic of Moldova | | 7,000 | | | | 156,000 |
| Kyrgyzstan | 300 | 800 | 13,600 | 95,100 | | 59,000 |
| Azerbaijan | | | | 90,000 | | 13,592 |
| Georgia | | | | 200 | | 10,700 |
| Uzbekistan | 1,000 | 1,800 | 3,500 | 3,300,000 | 17,900 | 10,500 |
| FYR Macedonia | | 2,000 | | | 45 | 5,400 |
| Albania | | | | 900 | | 2,400 |
| Tajikistan | | 30 | 5,000 | 419,700 | 400 | 2,000 |
| Bosnia & Herzegovina | | 3,925 | | | | 165 |

*Source: FAOSTAT. © FAO Statistics Division 2009*

### 3.1.1 Production and consumption

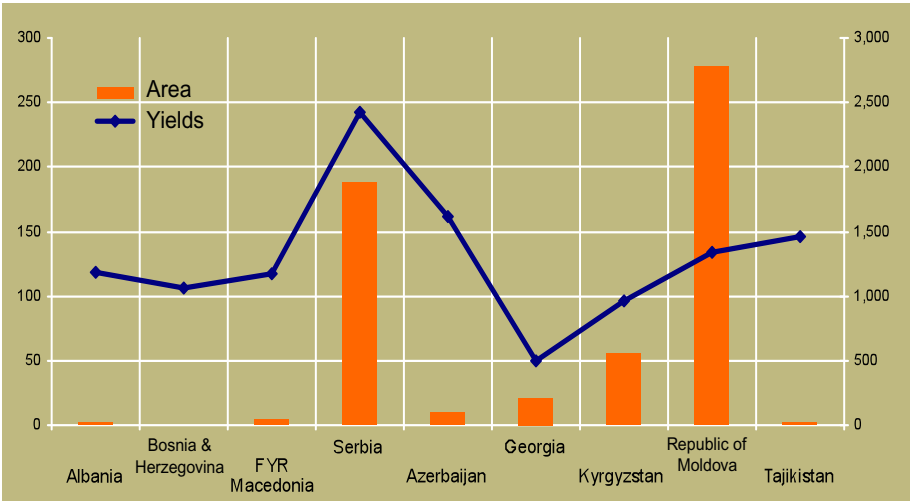
Among all the countries covered by this Agribusiness Handbook collection, the only significant producers of sunflower seed (and oil) are *Serbia* and *the Republic of Moldova,* with about 400,000 tons harvested annually in each country. Serbia has much higher yields: 2.4 tons per ha were harvested in 2008, which is almost twice as high a yield as Moldova's yield (of 1.3 tons per ha).

### Table 10: Area harvested (thousand ha) and yields (kg/ha) in the WBCs and the ETCs

| Country | 2006 | | 2007 | | 2008 | |
|---|---|---|---|---|---|---|
| | Area | Yield | Area | Yield | Area | Yield |
| **WBCs:** | | | | | | |
| Serbia | 186.4 | 2,065 | 154.8 | 1,903 | 187.8 | 2,419 |
| Albania | 1.3 | 1,692 | 2.1 | 1,143 | 2.1 | 1,190 |
| FYR Macedonia | 3.7 | 1,620 | 3.5 | 1,021 | 4.6 | 1,172 |
| Bosnia & Herzegovina | 0.4 | 1,051 | 0.2 | 730 | 0.2 | 1,060 |
| **ETCs:** | | | | | | |
| Azerbaijan | 10.6 | 1,500 | 9.2 | 1,466 | 10.3 | 1,611 |
| Tajikistan | 3.3 | 1,231 | 2.8 | 1,246 | 2.2 | 1,464 |
| Republic of Moldova | 287.4 | 1,322 | 233.6 | 666 | 278 | 1,338 |
| Kyrgyzstan | 58.3 | 1,091 | 56.7 | 1,093 | 55 | 964 |
| Georgia | 22.2 | 554 | 22.3 | 722 | 21.3 | 493 |

*Source: FAOSTAT. © FAO Statistics Division 2009*

### Figure 16: Area harvested (thousand ha) and yield (kg/ha) in the WBCs and the ETCs, 2008




*Source: FAOSTAT. © FAO Statistics Division 2009*

**Table 11: Sunflower seed production in the WBCs and the ETCs (thousand tons)**

| Country | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|
| **WBCs:** | | | | | | |
| Serbia & Montenegro | 360 | 360 | 360 | 371 | 392 | 250 |
| FYR Macedonia | 11 | 11 | 11 | 11 | 11 | 11 |
| Albania | 3 | 3 | 3 | 3 | 3 | 3 |
| Bosnia & Herzegovina | 0 | 0 | 0 | 0 | 0 | 0 |
| **ETCs:** | | | | | | |
| Republic of Moldova | 320 | 450 | 350 | 331 | 379 | 356 |
| Kyrgyzstan | 40 | 40 | 40 | 40 | 40 | 90 |
| Georgia | 5 | 8 | 20 | 20 | 20 | 20 |
| Uzbekistan | 5 | 5 | 5 | 5 | 5 | 5 |
| Armenia | 3 | 3 | 3 | 3 | 3 | 3 |
| Tajikistan | 1 | 1 | 1 | 1 | 1 | 1 |
| Azerbaijan | 0 | 0 | 0 | 0 | 0 | 0 |
| Mongolia | 0 | 0 | 0 | 0 | 0 | 0 |
| **Neighbouring markets:** | | | | | | |
| Russian Federation | 3,684 | 4,868 | 4,801 | 6,440 | 6,750 | 5,500 |
| Ukraine | 3,510 | 4,480 | 3,280 | 4,950 | 5,300 | 4,484 |
| Kazakhstan | 190 | 303 | 310 | 360 | 268 | 300 |

*Source: FAO estimates*

In spite of its modest size (3.4 million ha including Transdnistria), the Republic of Moldova is ranked 15–16$^{th}$ in the World Sunflower Seed Producers Rating (although it represents only 1.2% of world production). Sunflower has consistent planting areas (19.4% of total crop area) and is the third most produced crop after corn (31% of total area) and wheat (19.6% of total area)[4]. A majority of the sunflower hybrids are either local or of Russian or Ukrainian origin. While production is dispersed throughout the country, the best production regions are in the north. In the late 1990s, sunflower yields dropped due to the economic crisis. However, high demand on domestic and export markets stimulated an increase in the area planted. In fact, the area planted in sunflowers increased from an average of 120,000 ha in the beginning of the 1990s to over 230,000 ha in 2006.

Most local farms produce small lots of sunflower, below 100 tons a year, and "large" farms produce between 200 and 300 tons. As with other crops, sunflower yields declined over the last several years due to limited access

[4]. *Statistical Yearbook of Moldova 2008.*

to crop financing. Recently, a higher demand for exports has stimulated better farming practices and increased use of elite planting seeds. Currently, producers' prices are relatively high and stable, about USD 327 per ton (FAOSTAT, 2007 data).

Serbia produces on average 350,000–400,000 tons of sunflower seed annually, mainly in the Vojvodina region, which has the most fertile land in the country. The total planting area under sunflower in Serbia is about 200,000 ha. With regards to sunflower seed consumption, Serbia consumes almost the entire volume of sunflower seed produced.

A fair supply of raw material and proximity to European markets allow the Republic of Moldova to export 25% of its sunflower seed mainly to Ukraine, the United Kingdom and Romania[5]. Several years ago, the Moldovan average sunflower-seed exports were about 80,000 tons annually. Recently export volumes have varied from crop to crop, ranging from 140,000 tons in 2004 to 13,000 in 2008.

**Table 12: Sunflower seed exports in the WBCs and the ETCs (thousand tons, Oct.–Sep. basis)**

| Country | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|
| **WBCs:** | | | | | | |
| Albania | 0 | 0 | 0 | 0 | 0 | 0 |
| Bosnia & Herzegovina | 0 | 0 | 0 | 0 | 0 | 0 |
| FYR Macedonia | 0 | 0 | 0 | 0 | 0 | 0 |
| Serbia & Montenegro | 0 | 0 | 0 | 5 | 5 | 0 |
| **ETCs:** | | | | | | |
| Republic of Moldova | 115 | 140 | 100 | 64 | 94 | 13 |
| Georgia | 10 | 24 | 10 | 8 | 10 | 10 |
| Kyrgyzstan | 1 | 1 | 1 | 1 | 1 | 1 |
| Armenia | 0 | 0 | 0 | 0 | 0 | 0 |
| Azerbaijan | 0 | 0 | 0 | 0 | 0 | 0 |
| Mongolia | 0 | 0 | 0 | 0 | 0 | 0 |
| Tajikistan | 0 | 0 | 0 | 0 | 0 | 0 |
| Uzbekistan | 0 | 0 | 0 | 0 | 0 | 0 |
| **Neighbouring markets:** | | | | | | |
| Ukraine | 338 | 920 | 12 | 220 | 338 | 75 |
| Russian Federation | 186 | 351 | 61 | 370 | 155 | 45 |
| Kazakhstan | 1 | 25 | 20 | 20 | 25 | 1 |

*Source: FAO estimates*

[5] *UN Comatrde, 2008 value data.*

Liberalization of seed imports since 2000 has led to foreign seed producers gaining a share of the Serbian sunflower seed market.

**Table 13: Sunflower seed imports by the WBCs and by the ETCs (thousand tons, Oct.–Sep. basis)**

| Country | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|
| **WBCs:** | | | | | | |
| Bosnia & Herzegovina | 3 | 3 | 3 | 3 | 3 | 3 |
| Albania | 0 | 2 | 2 | 2 | 2 | 2 |
| Serbia & Montenegro | 0 | 0 | 0 | 2 | 2 | 2 |
| FYR Macedonia | 0 | 0 | 0 | 0 | 0 | 0 |
| **ETCs:** | | | | | | |
| Georgia | 16 | 64 | 1 | 2 | 20 | 20 |
| Armenia | 0 | 0 | 0 | 0 | 0 | 0 |
| Azerbaijan | 0 | 0 | 0 | 0 | 0 | 0 |
| Kyrgyzstan | 0 | 0 | 0 | 0 | 0 | 0 |
| Mongolia | 0 | 0 | 0 | 0 | 0 | 0 |
| Republic of Moldova | 1 | 0 | 0 | 0 | 0 | 0 |
| Tajikistan | 0 | 0 | 0 | 0 | 0 | 0 |
| Uzbekistan | 0 | 0 | 0 | 0 | 0 | 0 |
| **Neighbouring markets:** | | | | | | |
| Kazakhstan | 90 | 30 | 25 | 2 | 55 | 40 |
| Russian Federation | 7 | 10 | 10 | 11 | 5 | 10 |
| Ukraine | 3 | 11 | 6 | 4 | 4 | 8 |

*Source: FAO estimates*

## 3.2 Production of sunflower oil in the WBCs and the ETCs

Sunflower seed oil is considerably more popular in the ETCs than in the Mediterranean part of the WBCs, where olive oil is largely consumed. Oil made of oilseeds other than of sunflower seeds also represents an important share of vegetable oil production in the regions: olive oil in Albania, maize and cottonseed oil in Azerbaijan, olive and rape oil in the former Yugoslav Republic of Macedonia, and cottonseed oil in Kyrgyzstan and Uzbekistan.

**Table 14: Production of different type of vegetable oils in the regions, 2007 (tons)**

| Country | Cottonseed oil | Maize oil | Olive oil, virgin | Rapeseed oil | Safflower oil | Soybean oil | Sunflower oil | | Total vegetable oil |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Tons | Share of total oil prod. % | |
| Uzbekistan | 313,800 | 3,900 | | 610 | 2,000 | 2,300 | 0 | n/a | 322,610 |
| Republic of Moldova | | 5,300 | | 6,900 | | 12,100 | 97,700 | 80 | 122,000 |
| Tajikistan | 37,500 | | | | | | 800 | 2 | 38,300 |
| Bosnia & Herzegovina | | | | 1,600 | | 2,900 | 19,400 | 81 | 23,900 |
| Azerbaijan | 1,500 | 4,800 | 100 | | | 3,400 | 11,100 | 53 | 20,900 |
| Kyrgyzstan | 7,100 | | | 60 | | | 10,000 | 58 | 17,160 |
| Georgia | | | | | | | 7,200 | 100 | 7,200 |
| FYR Macedonia | | | 2,100 | 300 | | | 4,500 | 65 | 6,900 |
| Albania | 75 | | 1,100 | | | 85 | 610 | 33 | 1,870 |
| Armenia | | | | | | | 300 | 100 | 300 |

*Source: FAOSTAT. © FAO Statistics Division 2009*

In the Republic of Moldova, annual production of sunflower oil is estimated at about 100,000–130,000 tons. Sunflower seed is primarily processed to make cooking oil, while sunflower meal is used as an animal feed. The Ministry of Agriculture of the Republic of Moldova estimates crush level at 130,000 tons of sunflower seed per year. Sunflower oil represents about 99% of overall vegetable oil consumption in the country. Annual consumption of sunflower oil is in the range of 6.1–7.4 kg per capita[6] (excluding Transdnistria).

The largest (and the only currently operating) crusher in the Republic of Moldova is JSC Floarea Soarelui,[7] previously known as Belets Oil Extraction Plant (www.florisoil.ro). The plant produces high-quality refined and deodorized sunflower and soybean oil at a capacity of 200 tons/day and is working at full capacity for domestic and export production. This facility controls a market share of about 90% of the total sunflower seed processed in the Republic of Moldova. Crushers buy directly from the largest local producers and through purchasing agents who collect sunflower seeds from smaller producers.

In 2001, an international holding, W.J. Group Ltd., took over the plant, becoming

[6] *Consulting Agency Alataur – B.I.T.C., 206.*
[7] *"Sunflower" in Moldovan.*

its main shareholder. The company increased sales from USD 5.4 million in 2005 to USD 8.2 million in 2007. Every year 75–80% of sales are destined for export markets mainly the Russian Federation and other CIS countries (85% of all exports), then Belarus, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan but also Bulgaria, Hungary, Iraq, the FYR Macedonia, Romania and the United States.

Poor packaging and quality of locally produced oil continue to be one of the main constrains for increasing sales. The competition with sunflower oil from Romania and Ukraine is very strong. For example, in 2008 Floarea Soarelui had to decrease the retail price for its products by 32% to remain competitive with imports.

Local traditions still allow for a large share of sunflower oil be consumed in unrefined form. Some quantities of sunflower seeds are consumed as a dried product ("healthy snack") in the country and in the entire region.

Local sunflower meal production is estimated at 5,000 tons, all of which is used domestically. Primarily used by small farmers, the meal tends to be of low quality and is rarely used by livestock operations. In 2008, the EXW price of sunflower meal averaged USD 282[8].

### 3.2.1 Trade

The main importers of sunflower seed oil are Bosnia and Herzegovina and the former Yugoslavia Republic of Macedonia.

**Table 15: Sunflower oil imports in the WBCs and the ETCs (thousand tons, Oct.–Sep. basis)**

| Country | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|
| **WBCs:** | | | | | | |
| Bosnia & Herzegovina | 25 | 40 | 40 | 40 | 40 | 40 |
| FYR Macedonia | 20 | 20 | 20 | 20 | 30 | 28 |
| Albania | 21 | 21 | 21 | 21 | 21 | 21 |
| Serbia & Montenegro | n/a | n/a | n/a | n/a | n/a | n/a |
| **ETCs:** | | | | | | |
| Georgia | 11 | 11 | 20 | 20 | 20 | 20 |
| Tajikistan | 5 | 5 | 5 | 10 | 10 | 10 |
| Armenia | 9 | 9 | 9 | 9 | 9 | 9 |
| Azerbaijan | 7 | 7 | 7 | 7 | 7 | 7 |
| Uzbekistan | 7 | 7 | 7 | 7 | 7 | 7 |
| Kyrgyzstan | 4 | 4 | 4 | 4 | 4 | 4 |

[8] *Ukraine, APK Inform data.*

| Country | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|
| Mongolia | n/a | n/a | n/a | n/a | n/a | n/a |
| Republic of Moldova | n/a | n/a | n/a | n/a | n/a | n/a |
| **Neighbouring markets:** | | | | | | |
| Russian Federation | 193 | 175 | 136 | 102 | 124 | 131 |
| Kazakhstan | 34 | 60 | 60 | 63 | 50 | 55 |
| Ukraine | 1 | 7 | 4 | 20 | 30 | 1 |

*Source: FAO estimates*

On the export side, the Republic of Moldova is the main exporter of sunflower seed oil among the ETCs. Most of the sunflower oil exported from the Republic of Moldova is crude.

### Table 16: Sunflower oil exports from the WBCs and the ETCs (thousand tons, Oct.–Sep. basis)

| Country | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|
| **WBCs:** | | | | | | |
| Bosnia &Herzegovina | 8 | 8 | 8 | 8 | 8 | 8 |
| FYR Macedonia | n/a | n/a | 3 | 3 | 3 | 3 |
| Albania | n/a | n/a | n/a | n/a | n/a | n/a |
| Serbia & Montenegro | n/a | n/a | n/a | n/a | n/a | n/a |
| **ETCs :** | | | | | | |
| Republic of Moldova | 25 | 50 | 50 | 45 | 45 | 44 |
| Azerbaijan | 1 | 1 | 1 | 1 | 1 | 1 |
| Armenia | n/a | n/a | n/a | n/a | n/a | n/a |
| Georgia | n/a | n/a | n/a | n/a | n/a | n/a |
| Kyrgyzstan | n/a | n/a | n/a | n/a | n/a | n/a |
| Mongolia | n/a | n/a | n/a | n/a | n/a | n/a |
| Tajikistan | n/a | n/a | n/a | n/a | n/a | n/a |
| Uzbekistan | n/a | n/a | n/a | n/a | n/a | n/a |
| **Neighbouring markets:** | | | | | | |
| Ukraine | 912 | 979 | 657 | 1,500 | 1,850 | 1,369 |
| Russian Federation | 83 | 183 | 225 | 600 | 663 | 339 |
| Kazakhstan | 3 | 3 | 3 | 15 | 22 | 4 |

*Source: FAO estimates*

## 3.3 Investment projects

The EBRD finances quite a few producers of edible oil in the region:

| Country | Year | Project |
|---|---|---|
| Republic of Moldova | 2004 | The project involves the financing of W.J. Group's activities in sourcing (i.e. purchasing directly from farmers), transporting, storing and processing sunflower seeds in the Republic of Moldova and the Russian Federation, and the subsequent sale of bottled edible oil, sunflower seeds and crude oil, the latter two mainly for export.<br>Total project cost USD 80,000,000 |
| Kazakhstan | 2005 | The project is a brown field expansion of the operations of Turkuaz Edible Oil Industries, a subsidiary of Savola Edible Oils, through capital expenditures in the refining and crushing facilities. The project has had a strong transition impact, including a contribution to the development of sunflower seed cultivation in the Aktobe region and in the neighbouring regions.<br>Total project cost USD 49.8 million |
| Serbia | 2006 | A loan was made to local edible-oil producer Mladost Sid to increase production<br>The EBRD has loaned Mladost Sid, a Serbian edible-oil processing company owned by Victoria Group (a major agribusiness company), EUR 10 million to buy more sunflower seeds to increase production of its main products, including crude sunflower oil and sunflower meal.<br>Total project cost EUR 10 million |
| Serbia | 2007 | The clients of the project are Victoria Oil (previously named Mladost Sid) and Sojaprotein, joint-stock companies incorporated in Serbia and owned 100 % and 44.7%, respectively, by the sponsor Victoria Group. The sponsor is the biggest processor of soybeans in the region and has combined seed crushing capacity of 500,000 thousand sunseeds/per annum.<br>Through the success of the project, Victoria Group (Sojaprotein) will further strengthen its corporate governance standards and be in a position to increase the financing levels and technical know-how it provides to farmers and cooperatives.<br>A component of the project is related to energy cost-saving measures as the crushing industry is capital-intensive.<br>Total project cost USD 82.55 million |
| Bosnia & Herzegovina | | The EBRD is providing a EUR 4 million loan to Bimal, Bosnia and Herzegovina's sole edible oil producing company, to help the company expand its export volume and to support farmers in the region by boosting purchases of their products.<br>Bimal is the only edible-oil processor in Bosnia and Herzegovina that has crushing, refining and bottling capacities.<br>Total project cost EUR 4 million |

Several other investment projects in this sector have been conceived in the recent past, although mostly in the biofuels industry. However, it is unlikely that they will be realized because they are highly controversial and involve food security issues. For more information on biofuels, please consult the FAO State of Food and Agriculture (SOFA) 2008 report available at http://www.fao.org/docrep/011/i0100e/i0100e00.htm

## 4. FURTHER READING

- FAO Food Outlook, www.fao.org/giews/english/fo/index.htm
- The Oil World, www.oilworld.biz
- National Sunflower Association (NSA), www.sunflowernsa.com
- EC Seed Crushers and Oil Processors Federation (FEDIOL), www.fediol.be
- Federation of Oils, Seeds and Fats Associations (FOSFA), www.fosfa.org
- International Association of Seed Crushers (IASC), www.iasc-oils.org
- National Oilseed Processors Association (NOPA), www.nopa.org
- Union for the Promotion of Oil and Protein Plants (UFOP), www.ufop.de

European Bank
for Reconstruction and Development


Food and Agriculture
Organization of
the United Nations