

Current uses and markets of the French Sunflower production

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ABSTRACT

- France is the first sunflower producer in the European Union (EU27) with 1.64 million tons of seeds in 2010. For all actors dealing with this crop, it is necessary to share information and data on the major existing outlets for the domestic sunflower. The available statistical data and public information are not sufficient to deliver a comprehensive and integrated scheme of the outlets offered to the French sunflower production. This study aims at identifying the main flows and uses of the seeds harvested in France and of the oil and meals obtained after their crushing and also at better understanding the main factors driving the current market. Some perspectives are eventually drawn.
- The study is mainly focused on the three last campaigns (2008-2009, 2009-2010, 2010-2011). The used method consists of collections and analysis of French statistical data (SCEES, FranceAgriMer balances) and international statistical data (Oilworld) for seeds, oil and meal productions and changes. In addition, data and information have been got on the market especially through contacts with the industrial operators (biodiesel production, rate of introduction of sunflower in biodiesel and oleochemistry.) and surveys analyses (Nielsen panel 2010 for table oils, Huilerie de France for meal consumption, ONIDOL survey on the French oils market of 2003). The first step was to evaluate the destination of the seeds (exports, direct uses, crushing). For oil outlets, efforts have been made to separate linoleic and oleic oils in order to identify some specificity on the market in relation to their respective fatty acid profiles. For meal usages, estimates are based on the results of simulations giving the introduction rate of sun meal in the feed for the main animal categories (CEREOPA model).
- 80 % of the French sunflower seeds production goes for domestic uses (90% for crushing, the rest for birds and confectionary). All the meal manufactured in France is used for domestic feeding and value is limited by the cellulose content (30% to 50 % for cattle, 20% to 30 % for rabbits, 15 to 20 % for pigs and poultry). In general, a significant part of the sunflower oil produced in France is exported (net exports: 214 000 tons in 2010). The remaining volumes are sold mainly for food consumption since only 14% has been estimated to be marketed for non food uses in 2010 (51 000 tons). For 2010, 20 % of the sunoil has been estimated to be consumed as table oil for home cooking, 38% in out-of-home places, and 30% in food industry (like margarine). The share of sunoil was observed to decrease in the oil-tables since the year 2000 but thanks to the oleic type introduction, sunoil remained the leading oil in France. For the oleochemical market, paints and inks still represent the most important outlets (72 % and 21 %) mainly based on the classical linoleic oil meanwhile in France only 7 % (from oleic type) would enter into the biolubricant formulations. Biodiesel minor market tended to slow down during the last years for sunoil.
- The oil market was observed to change in the last decade due to several factors :i) increase of industrial and out-of-home food consumption and decrease of home cooking ii) higher availability of oleic oil offering more solutions for oil blends iii) new non food uses in biodiesel and oleochemicals markets. The analysis of the meal market in France showed that a better value could be obtained by an extension of the dehulling process in the French industry (dehulled meal from Argentina or Ukraine are appreciated). Expected growing needs in biobased raw materials for chemicals, good sustainability of the sunflower production chain compared to some imported oils and the diversified offer of sunflower fatty acids profiles should lead to an increase of the domestic demand and encourage R&D efforts in Europe.
- This study delivers useful quantitative and qualitative data on the sunseeds, sunoil and sun meal markets in France. It points out the ongoing changes in the market and gives promising perspectives for the future.

Key words : sunflower –sunoil –sun meal- market

INTRODUCTION

Development of the sunflower crop started in France at the end of the 70's. Its cultivation was promoted in order to produce domestic and edible oil which should substitute butter for cooking (health concerns) and groundnut seeds and oil imported from Africa. Thanks to huge R&D efforts of all actors, France has become the first sunflower producer in the European Union (EU27) with 1.634 million tons of seeds in 2010 and both types of sunflower (linoleic and oleic) are cultivated. Today, France plays a significant role in the sunseeds market and also in the sunflower oil and meal market in France and in Europe. For all actors dealing with this crop, it is therefore necessary to share information and data on the major existing outlets for the domestic sunflower. Statistical data exist on some items but not on all of interest, private information also exist but is mainly kept confidential by the companies, so there is a need for more comprehensive and integrated data on the sunflower markets.

This study aims at identifying the main flows and uses of the seeds harvested in France and of the oil and meals obtained after their crushing and also at better understanding the main factors driving the current market. Some perspectives are eventually drawn.

MATERIAL AND METHODS

The study is mainly focused on the last three campaigns (2008-2009, 2009-2010, 2010-2011).

The method used consists of collections and analysis of French statistical data (SCEES, FranceAgriMer balances) and international statistical data (Oilworld) for seeds, oil and meal productions and changes. In addition, data and information have been obtained on the market especially through contacts with the industrial operators (biodiesel production, rate of introduction of sunflower in Biodiesel and oleochemistry.) and survey analyses (Nielsen panel 2010 for table oils, Huilerie de France for meal consumption, ONIDOL survey on the French oils market of 2003). First step was to evaluate the destination of the seeds (exports, direct uses, crushing). For the oil outlets, efforts have been made to separate linoleic and oleic oils in order to identify some specificity on the market in relation to their fatty acid profile. For meal usages, estimates have been based on results of simulations giving the introduction rate of sun meal in the feed for the main animal categories (CEREOPA model).

RESULTS

1. From harvest to first processing steps : outlets breakdowns of the French sunflower production

From 2007 sunflower cultivation increased by 35 % in France to reach 695 000 hectares in 2010 (735 000 ha in 2011) mainly due to good prices and to a more favourable European agricultural policy (see the paper "Sunflower crop management in the new agronomic, environmental, social and societal context: challenges for a sustainable production in France" of P Jouffret and coll) - Table 1.

During the same period the oleic type share went up and in 2010 54% of the sunflower acreage was planted with oleic varieties.

- **No or few direct uses at the farmer level**

Whatever the year, more than 90% of the sunflower production is claimed as delivered after harvesting to grain commercial storage facilities which belong to private or cooperatives organisations (Source FranceAgriMer, commission bilans et douanes) (Table 1). The rest of the sunflower production (less than 10% a year) is considered to be directly used at the farm level for example for oil pressing or incorporation in animal feeding but some marginal quantities could be involved in unclaimed exchanges. Those figures show that sunflower production is entirely included in an industrial processing chain and that direct uses at farm level are minor contrary to some other crops like peas.

Table 1: Production, collection and geographical destination of the French Sunflower cultivation

	2010-11 estimated sept 2011	2009-10	2008-09	2007-08	mean value over 4 periods
sunflower surfaces (1000 hectares)	695	725	627	515	640
Sunflower production (1000 tons)	1 641	1 690	1 575	1 313	1 555
unidentified uses at farmer level (direct uses or marketing) (1000 tons)	134	64	172	93	116
delivered seeds to grain storage facilities	1 517	1 626	1 403	1 220	1 442

(privates and cooperatives)	in 1000 tons					
	%	92%	96%	89%	93%	93%
exportation (among the delivered seeds)		418	352	333	315	354
(1).....	in 1000 tons					
	%	28%	22%	24%	26%	25%

Source: French Agency FranceAgriMer, Commission des douanes et bilans

(1): we assume that exported grains are originated from France

- **Exportation of a quarter of the French production**

During the studied period, around a quarter of the collected sunflower grains was exported each year (table 1). The main destination of French sunseeds is Spain (64% in 2009 and 50% in 2010, source Oil world 2011) which is one of the most important sunflower consumers in the EU and which is located near to the main sunflower area in France (south western France) thus optimizing the logistic costs. In spite of an increase of the production during the studied period, the exportation rate remained quite stable (26% in 2007-2009 against 28% in 2010-2011) suggesting that the domestic sunflower processing increased at the same time.

- **Crushing of the majority of sunflower seeds processed in France**

Table 2: Availability and uses of the French sunflower production

In 1000 tons	2010-11 estimated sept 2011	2009-10	2008-09	2007-08	mean value over 4 periods
French sunflower collected production	1 641	1 690	1 575	1 313	1 555
unidentified uses at the farmers level	134	64	172	93	116
Exportation	418	352	333	315	354
French sunseeds availability for domestic uses	1 088	1 274	1 070	906	1 084
imported sunseeds	270	148	228	42	172
open sunseeds stocks	240	190	155	235	205
total sunseeds availability for domestic uses (1)	1 598	1 612	1 453	1 183	1 462
crushing	1 375	1 335	1 234	1 023	1 242
other minor uses (certified seeds, grain incorporation, grain losses...)	36	37	29	5	27
total domestic uses (2)	1 411	1 372	1 263	1 027	1 268
ending stocks (1)-(2)	188	240	190	155	193

Source: French Agency FranceAgriMer, Commission des douanes et bilans

French sunseeds availability for the French industry has reached more than 1 million tons (Mt) since the campaign 2008-2009 thanks to a higher cultivation area and it is expected to grow up to 1.3 Mt in 2011-2012 (table 2). Crushing is by far the most important use of the sunseeds produced and processed in France and the rate of crushing on total available resources remained quite stable over the studied campaigns (from 83 to 86%, average of 85%). It indicated that the French crushing industry switched more towards sunflower in response to the higher sunflower production and to good oil market value (44% oil in seeds), that is confirmed by the regular increase of crushing from 1.02 Mt in 2007-2008 to more than 1.3 Mt in 2010-2011. This trend will be accentuated in 2011-2012 (1.7 Mt expected for 2011-2012) and probably during the forthcoming years.

Among the minor uses, bird feeding and confectionary markets are probably the most important if we refer to the registration of dedicated varieties and to the presence of operators dealing with this market in France. However, comparing to other countries like Spain or United states, the confectionary market remains definitively very small in France.

2. Exportation and food uses for the sunflower oil manufactured in France

Thanks to the recent implementation of the sunseeds crushing capacities, France has overcome Spain for sunflower oil manufacturing. By the way it has become the major sunoil producer in EU27 since the year

2008 with more than 500 000 tons of oil a year (table 3) and now accounts for about 23% of the sunoil production in the EU27 (total sunoil production in EU27: 2.41Mt (2009), 2.44 Mt (2010)).

- **Net exports of sunoil for France for the last two years**

At the present time France exports more sunflower oil than it imports that indicates that a part of the domestic sunoil production is sold outside France (table 3). In relation to the high share of the oleic production in France (more than 50 % during the last two years) and to the increasing demand for oleic oil at the European level we can suppose that mainly oleic oil is exported (lack of statistical figure). During the last two studied years (2009 and 2010), the main three customers were the United kingdom (26% in average), the Netherlands (23%) and Benelux (15%).

Regarding to the imports, nearly 50% of the imported sunoil came from Ukraine in 2009 and 2010, and the rest was supplied by Benelux and Argentina. In reference to the genetic type that is cultivated in Ukraine and Argentina, it can be assumed that mainly classical linoleic sunoil is imported in France.

Table 3: Sunflower oil production and trade in France

In 1000 tons	2009	2010
oil production	589	568
oil exports (1)	367	399
oil imports (2)	238	185
exports-imports	129	214

Source: Oilworld, May 2011

As a result, total consumption of sunflower oil during the last period ranged between 350 000 tons and 450 000 tons a year in France, ranking at the second place after rapeseed oil.

- **Non food uses remained minor for sunoil in France**

Our estimate of the sunflower oil methyl esters incorporation in biodiesel has been based on the supposed share of the sunflower oil in the biodiesel blend (2 to 5% depending on the years) and on a biodiesel production of 1.8 Mt/year in France. We thus evaluated a possible use as biodiesel component ranging between 35 000 and 40 000 tons a year probably split between both oleic and linoleic types (Borredon and Coll, 2011). This weak current use of sunflower oil in biodiesel is explained by the insufficient technological characteristics displayed by the linoleic type (iodine value over the specification threshold) and by the better price got on the food market for the oleic oil type which allows to improve the biodiesel blend characteristics (iodine value, oxidative stability). Regarding the other non food uses, our survey for the years 2009 and 2010 indicated the oleochemical industry consumed between 12 000 and 15 000 tons a year in France and that volumes involved seem to slightly increase. Traditional uses in paints, resins and the most recent segment of the vegetable inks represent the main volumes (>90%) and concern the linoleic type meanwhile the lubricant outlet (<10%) is based on the oleic one.

All in all the share of non food outlets is not higher than 15% of the total sunflower oil consumed in France that is significant but still much less important than the food market (figure 1).

- **The food market as main outlet for the sunoil in France**

The food market has been estimated to weigh about 350 000 tons for 2010 tacking up the non-food outlets share (see below) and the statistical value of total oil disappearance in France.

The share of sunflower oil in the salad and cooking oil home market has been estimated using the results of a survey on the different oils which delivers the yearly volume of pure sunflower oil bought by consumers (Nielsen panels from 1999 till 2010) (figure 1). The proportion of sunflower oil in combined oils and frying oils was calculated from an estimation of the introduction rate of sunflower (using information on labels and through direct contacts) in these different kinds of blends.

The other two segments of the food oil market, which are food industry and out of home dining, were estimated using a ratio between both segments we obtained in our survey of 2004 on industry and out of home oil markets in France (Dubois M., 2004). As shown in figure 2, the home market remains the most important for sunflower oil in France with a share of 40%. Moreover sunflower oil kept its first ranking among the home oils in spite of a global decrease of the direct consumption of oil at home (15% drop in 10 years) and of the diversification of the marketed oil types (nuts, blends for specific uses, flavoured oil..). Four major factors could explain that the sunflower oil kept a pole position:

- the neutral taste and the fatty acid composition which allow the use as salad dressing as well as oil cooking (multi-functional oil); so for people buying only one kind of oil it offers a good quality/price ration;
- the good image of sunflower oil which is assimilated to good health impacts;
- the cultural habits of French people who switched to this oil in the 80's;
- the emergence of the oleic type (> 75 % of oleic acid) 10 years ago which opened new usages especially for frying thanks to the thermo-oxidative resistance related to the high content in mono-unsaturated oleic acid (C18:1, oleic acid)

Figure 1: Evolution of the oils purchases in super markets, hyper markets and hard discounts stores in France (2000: without hard discount) – Source of collected data: Panel Nielsen

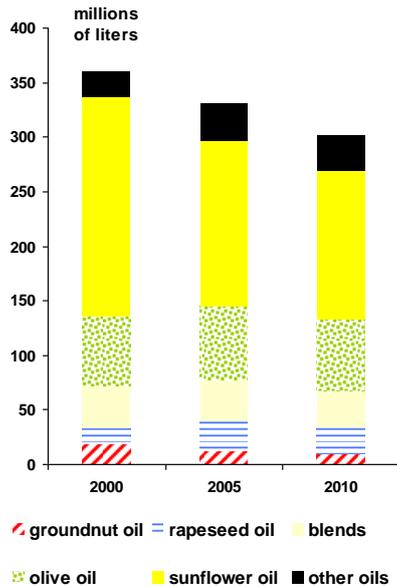
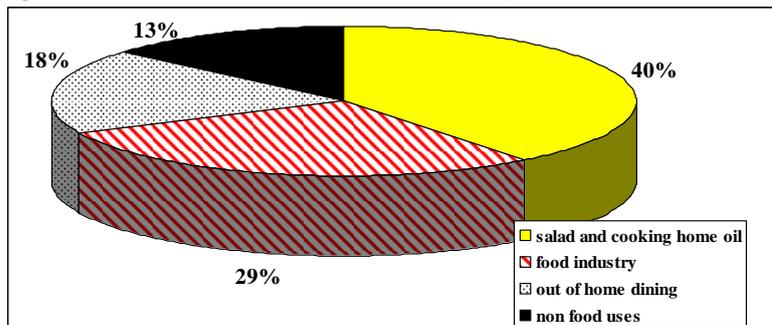


Figure 2: Outlets of the sunflower oil in France, ONIDOL and SOFIPROTEOL estimates for 2010



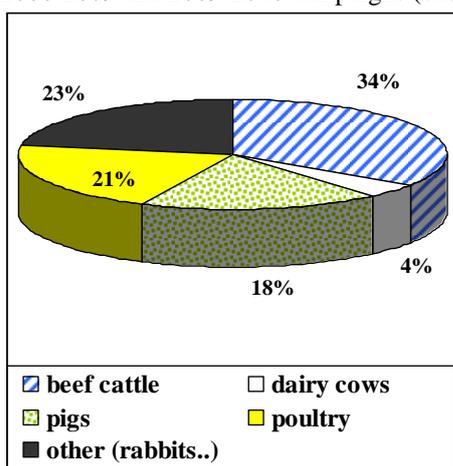
3. Inside consumption of all sunflower meal produced in France

The introduction of sunflower meal in feeding formulations is limited by its high fibbers content (25%) and its consequential low protein content (27-29 %). Seeds dehulling process before oil pressing has been largely implemented in the world in order to improve the composition of the meal. Even if only one medium crushing plant was able to deliver semi-decorticated sunmeal until this year in France, the meal manufactured in France is in general all consumed in the domestic market and some years, extra quantities of sunmeal are imported to meet the needs of the animal feeding sector (300 000 tons were imported in 2010). By the way 600 000 to 900 000 tons of sunflower were consumed yearly during the last 4 year period. Using the results given every 3 months by a model developed by the CEREOPA (introduction rate of the different components in the formulation for each type of animal feeding) and the

volumes of the main animal feeding yearly manufactured in France, we estimated the different uses of the sunflower meal (figure 3).

The segments which consume more sunflower meals (beef cattle and rabbits) are not the most valuable and the most promising for feeding industry. So in order to increase the introduction rate of sunflower meals in the monogastric or dairy feeding formulation which are more dependant of feed industry, the French crushing industry decided to invest in dehulling processes able to deliver Hi-pro meals (36% protein).

Figure 3: Use of sunflower meal in the different types of animal feeding – average of simulations for 2008-2009 and 2009-2010 campaigns (based on CEREOPA modelling, 2009 and 2010).



DISCUSSION

This study showed that the French sunflower production is structured by the existence of a strong domestic crushing industry and by a strong domestic sunoil and sunmeal markets. The cultivation of both types oleic and linoleic types allowed sunflower to keep the first ranking in the food oil segment in France while enlarging the potential uses of the oil and to find outlets in EU for the extra oil quantities. This demand for oleic is expected to continue to grow in Europe in relation to the need for frying oil in substitution to hydrogenated oils and fats and to the incoming palm oil societal ban. Regarding the non food market the oleic and the very high oleic types (>90% acid oleic) show promising perspectives in the field of biobased chemical intermediates and polymers and also in the biolubricant sector in relation to the well-suited physical-chemical properties of the oleic fraction and to more severe environmental constraints. The research works have to be strengthened in this area in France and in EU in order to offer viable biobased alternatives to the chemical industry. For sunflower meals, future is also quite good in France if the crushing industry is able to deliver more stable and less fiber/higher protein content products to the animal feeding sector and if R&D efforts are directed towards new potential customers (monogastric animals) of regions located near to the crushing plants. The recent increase of sunflower surfaces observed in France make all these challenges at each step of the sunflower chain stronger. .

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