

## QUALITY PROBLEMS IN RAW MATERIAL OF OLIVE OIL MILLS AND MARKETING CHANNELS: CASE OF TURKEY

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### *Abstract*

*Most of the olive oil mills exist in Izmir, in Turkey. The aim of this study is to determine the quality problems of the olive and olive oil, and to suggest some solutions regarding the problems. 41.7% of mills' managers stated that they had some problems about olive quality. Percentage and likert scale were used for analyzing the data. Refined olive oil factories and middle scaled olive oil factories have an important role in the marketing channel. 70% of the yield is delivered to these factories. The second important factor in the marketing channel is the bulk suppliers (20%). The bulk suppliers give almost all the yield to the middle and large sized factory. The rest (10%) is constituted of the self consumption of the farmers.*

**Key words:** olive oil processing center, raw quality, olive oil sector

### INTRODUCTION

The origin of the olive is not known but is speculated to be Syria or possibly sub-Saharan Africa. For more than 6 000 years, the cultivated olive has developed alongside Mediterranean civilizations and is now commercially produced on more than 23 million acres (9.4 million ha) in the Mediterranean basin (Vossen, 2007).

The olive oil, which is extremely important for human health, is also very important for the national economies. The factors such as employment, foreign trade, national income, and value added contributions have its importance increased.

According to 2006/2007 production period it's an emphasized sector in Turkey, which is the fifth country around the world with its capacity of 5% world's olive oil production (IOOC, 2008). Recently, the subject about the sector, which becomes more important day by day, is the factors which affect the quality of the product from production to the packaging step.

While many of processing centers are trying to reply to requirements related with high quality olive oil, they are also face to face with some problems like olive supply, cost increases and marketing problems related with this.

In Turkey olive oil production industry mostly seen at Aegean Region especially in Izmir which has the olives suitable for taking high quality oil. Because of this, the applications that affect the quality of the olive oil are observed at the processing centers chosen from Izmir.

### MATERIALS AND METHODS

Izmir is located in the west of Turkey. It is the third biggest city in Turkey in terms of economic and social indicators. Izmir provides 20% of olive production of Aegean Region where the olive production is mass

(TURKSTAT, 2008). Nearly all of the olive oil processing centers, industries and export centers are also in Izmir.

The material used in the study was collected by face to face surveying with supervisors of the whole 15 of olive oil mills in Izmir. Surveys were carried out between February-March 2007.

The process centers that we are discussing about are modern and big enterprises working with Continuous System.

Percentage and likert scale were used for analyzing data. Likert scale is a grading system, and the most positive alternative is five for all variables in the scale. It means that; applications have answered all expectations. Four means; expectations have answered, three means; expectations have answered partially, two means; expectations have answered at low level and one means; expectations haven't been answered.

### RESULTS AND DISCUSSION

#### **Legal legislation about quality practices of olive oil in Turkey**

Turkish Food Codex Olive Oil and Pomace Oil Announcement has been prepared by Ministry of Agriculture and Rural Affairs, and it has been put into effect upon its publication in Official Newspaper dated 03.08.2007. With this announcement, Turkish Food Codex Culinary Olive Oil and Culinary Pomace Oil announcement have been revoked which was published in 1998. With foregoing announcement, one year has been given to related firms for adaptation. This period has been determined as 3 years to harmonize for sensitive features of natural olive oil. The mainly matters in the announcement are (Prime Minister of Turkish Republic, 2007):

- a) While olive oil has been expressed only from the fruits of the olive tree, natural olive oil can be produced by means of mechanical or physical process such as rising, pressing, centrifuging and filtration in a thermal environment which does not cause any modifications in terms of natural characteristic in the fruits of the olive tree.
- b) Suitable for direct consumption with a free fatty acidity of less than 0.8 gram in 100 grams in terms of oleic acid type is named as "Extra Virgin Olive Oil", with a free fatty acidity of less than 2.0 grams in 100 grams in terms of oleic acid type is named as "Fine Virgin Olive Oil", with a free fatty acidity of less than 3.3 grams in 100 grams in terms of oleic acid type is named as "Ordinary Virgin Olive Oil".
- c) Olive oil can't be mixed with other liquid oils and the other liquid oils can't be mixed with olive oil and also olive oil and prime oil won't be able to submit as bulk to consumer.
- d) No food additive will be added to natural olive oil; alpha tocopherol can be added so as to bring in natural alpha tocopherols again, which are lost during rafination. But alpha tocopherol concentration can't exceed 200 mg/kg in the final.

#### General characteristics of the mills and managers

Generally enterprises which are built in major place of olive production and they only work on pressing olive. These enterprises work for 4.5–5 months and they abort the production for 7.5–8 months in on years. This period decreases to 2 months in off years. This study determines that the 70% of enterprises have difficulty in finding enough olive (raw material). Just as enterprises' capacity utilization average rate is 44%. Twelve of these enterprises work one labor shift, two enterprises work two labor shift and only one of them work three labor shift. Average age of managers' of olive oil processing centers' is 49, their average education period is 9 years and their experience is 26 years. Most of the enterprises are family business and the management in olive oil processing industry passes from a father to the son. Eight of the enterprises are partnership companies, six of them are equity companies and one of them is cooperative enterprise. Only two of the enterprises have a food engineer.

#### Raw material supplying and quality problems

Mills (enterprises) provide the raw material (olive) from their own production with 11.1%, directly from a producer with 22.2%, from own production and a producer with 22.2%, from middlemen with 22.3%. The big part of the mills (91%) process the olive for firm and a producer. Only 8.3 % of them process their own product. Main problems of managers related with processing activity have evaluated according to likert scale. Consequently the competition is 5.00, low capacity utilization

is 3.50, high labor cost is 3.00, effect of periodicity is 3.00, high input price is 2.91, low quality of olive is 1.67 and low efficiency in olive is 1.50.

Although a lot of enterprises have too much business volume, they endeavored about increasing the amount of coming product. The most common activities of these efforts are giving advance to olive producers before processing, transportation of product without charge at the harvest time and storage of olive oil for producer. But enterprises have no steel or faience warehouse to storage produced olive oil for a long time. 41.7% of enterprises' managers stated that they had some problems about olive quality. According to managers of olive processing institution, the most important factors that affect the quality of olive oil are; transportation method of olive to firm and waiting period before processing. Raw material (olive) quality problems in mills, was determined in the previous studies in Turkey (Olgun, 1992; Tan, 2001; Kocak, 2002; Cengeler, 2004).

The desirable way of transporting olive should be in plastic boxes. Thus, plastic boxes enable both the duration period before the processing and do not cause high acidity in the olive oil. However, in the researched farms it is found out that the olives are mostly transported in (75%) sacks or in bulk (16.7%), 8.3% of the olive which is a very low ratio, is carried in plastic boxes for processing. This situation effects the quality of the oil negatively.

Besides, the way of carrying, the other factor that effects the olive oil quality is waiting period of the olive before process. The olives which are waiting the process especially in sacks or in bulk, because of the oxidation/fermentation process, the acidity of the oil increases seriously parallel to the waiting period and also the quality of the olive oil decreases. Long duration period occurs mostly in hydraulic press units and super-press units. Average waiting period of the olive in these units varies between 2–4 days, in primitive systems this period extends to 7 days.

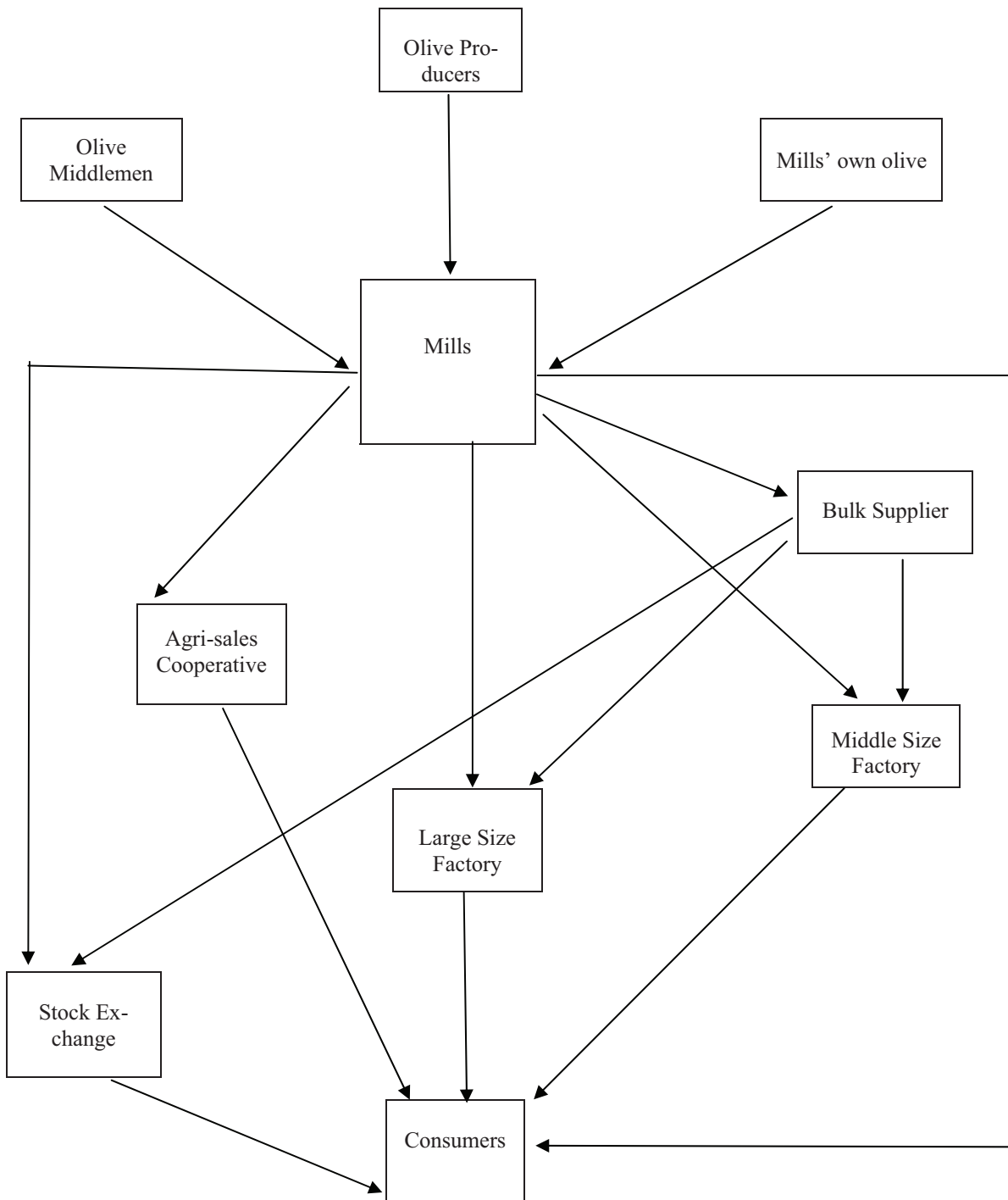
The other factor that effects the olive oil quality is the operation method of the olive mill. Although the researched olive mills are all continuous system plants, the ratio of the hydraulic press units and super-press units is high. In these units considerable amount of olive is processed. As a result; production of low quality olive oil increases and considerable amount of olive oil is utilized in soap making.

Further more, the processors expressed that the reasons that effect the olive oil quality negatively, are foreign materials which are mixed into olives and processing the top and the bottom olives together.

The criteria of the directors' of the olive mills' for taking the raw olive for process have evaluated according to likert scale as follows; efficiency is 5, quality is 4.9, acidity degree is 3.8, price is 3.6, customer's demand is 3.3, breed is 2.0 and production place is 1.8.

The marketing channels of the olive oil which is found in olive mills can be seen in Figure 1.

**Figure 1:** The source of raw material for the mills and olive oil marketing channel



Refined olive oil factories and middle scaled olive oil factories have an important role in the marketing channel. 70% of the yield is delivered to these factories. The second important factor in the marketing channel is the bulk suppliers (20%). The bulk suppliers give almost all

the yield to the middle and large sized factory. The rest (10%) is constituted of the self consumption of the farmers.

In the studied farms, olive processor plants have many different working styles. They are working in deter-

mined rate (10–15% of the produced oil) or, they are working in a determined price (0.05 YTL mill price per kg). The owner of these plants also deal with olive oil trade, they can buy olives where they gain money from milling commission. So, the owner of the plants have an important role in marketing olive oil both buying the olive oils by milling commission, and milling their own olives from their plantation.

The important quality indicator of the olive oil is low acidity degree. When the olive oil is examined solely to its acid content in the studied mills, 16.7% is under 0.50, 24.9% is 0.50–1.00, 41.7% is 1.00–1.25 and 16.7% is 1.25–4.00. The 83.3% of the olive oil is virgin olive oil, and the rest (16.7%) is extra virgin olive oil in the studied plants.

The 75% of the directors of the studied mills stated that acid content of the olive oil has decreased in the last few years. The main reasons of this situation are; firstly using continuous systems, organically produced olives, non- using of chemical fertilizer, early harvesting, appropriate climate conditions, decrease in use of pesticides.

The problem of the directors regarding olive oil marketing is evaluated to Likert Scale. According to this evaluation, likely not getting the best price is 4.25, unstable prices is 4.08, lack of quality olive for the demand is 2.25, delays on payment and not obeying the rules of contract by the customers are 1.25 and not finding a customer in desired time.

### CONCLUSION

Turkey is an important country in olive oil production and has some problems in providing raw materials in olive oil process industry. In this study, 15 directors of olive oil mills' main have stated problems regarding the oil quality. These are unsuitable ways of transferring the olives, long waiting period, unsuitable waiting conditions before the milling process of olives, foreign materials in olives, mixing the top and bottom olives. Furthermore, the other important problem for storing the olive oil is lack of warehouses. In recent years, so many efforts have been taken to solve these problems such as

an increase in number of the modern plants, a premium support aiming increasing the quality has put into practice as parallel to the European Union (EU) applications, certificated sapling support, licensed warehousing applications. These progresses made farmers give more importance to olive production, making more cultivation activities. That's why it has been observed for this reason it is seen that the raw material quality is increasing day by day. It is suggested that the olive oil processors should increase their efforts to have a high production, and in this scope the education activities of the farmers should be raised as well as usage of modern harvesting methods.

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