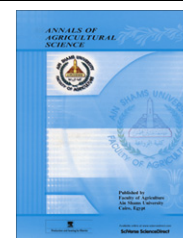




Faculty of Agriculture, Ain Shams University

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An economic study of processing problems for the main important varieties of dates in Saudi Arabia

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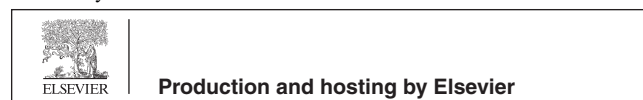
KEYWORDS

Production;
Saudi;
Dates;
Economics;
Manufacturing;
Processing

Abstract Although the production of dates increased extensively, processing sector of Saudi dates face many problems. By studying economic indicators of dates, the results show that there are improvements in all general economic dates indicators such as production, consumption, export, and import of Saudi dates during the study period. Although production of dates increased by about 86%, processing dates is only 10% of total production during 2000–2010. By studying the manufacturing problems, the results show that there are multiple production and marketing problems in manufacturing process such as the low quality of some dates varieties, inefficient marketing services (*lack of standardising and grading*), Government regulations, and manufacturing deterioration. In addition to processing problems related to the morphology characteristic (size, color, weight, etc.) and chemical contents (sugar, glucose, fructose, etc.) of date varieties. As a result of processing problems, feasibility for processing some dates varieties is now in depute such as Ehalas and Rezez produced from eastern Governorate. So, this paper study the processing problems of Saudi dates moreover study local and foreign consumers needs of Saudi dates by analysis the local and foreign demand of processed dates varieties such as size, color, taste, chemical, and morphology characteristics. The research supposes some possible solution for solving these processing problems and promoting marketing and manufacturing sector of Saudi dates. Finally, it is important to build a strategy plan that is concentrating on the cultivation varieties for export according to the foreign consumers' needs other than local consumers' needs to improve the export percentage of total dates production, which is very limited (5%) for the third world producer.

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**Introduction**

In the last decade, KSA pay more attention for palm date cultivation. Scientific research studies related to palm date are the important priorities of Gulf countries (<http://www.icarda.org>).

The Gulf region of the Middle-East, which comprises of six countries, namely, Kingdom of Saudi Arabia (KSA), United Arab Emirate (UAE), Sultanate of Oman, Kuwait, Qatar,

and Bahrain accounts for nearly 30% of the global date production (Dyer and Singh, 1998). KSA is the region top producers. During the last two decades, there has been a significant increase in the agricultural area for palm date. Producers of dates in KSA suffer from low date prices as a result of supply surplus. ([http://en.wikipedia.org/wiki/Date_\(fruit\)#Fruit](http://en.wikipedia.org/wiki/Date_(fruit)#Fruit)).

Many studies refer to a huge increase in production of dates in Saudi Arabia with little improvement of manufacturing process in addition to fluctuation of manufactured quantity of dates (Arabic organization for agricultural development, 1999).

In Saudi Arabia, there are about 43 factories for processing dates (Eleid, 2008). The processing quantity of dates was about 9% of total dates production. These factories package dates in addition to many dates products such as Paste, Jam, Forage, Vinegar, Molass, and other.

In reality, KSA achieved huge increase in dates cultivated area during the last decade (William et al., 2004). Although KSA is considered as the third world producer of dates, it faces many problems during manufacturing process. Because of KSA suffer from many manufacturing problems of dates industry, dates prices decrease. In reality, manufacturing of dates faces multiple obstacles variables. Where there are many dates varieties unsuitable for manufacturing and used only for feeding animals in addition to the high level of loss during production, marketing, and manufacturing process. Consequently, the exported quantity of dates is very limited (5% of about one million tonne 2010).

The research aims to analysis the dates manufacturing sector in order to

- A. Describe the manufacturing situation of dates.
- B. Determine the manufacturing problems.
- C. Determine some suitable solutions for these processing problems, in order to help dates sector for achieving the competitiveness in the local and international markets.

Materials and methods

The study depends on descriptive and statistical analysis such as trends, regression, ANOVA analysis, and LSD test. The study depends on secondary data from local level such as agricultural and economic & planning ministries and international level such as FAO www.faostat.org and www.comtrade.un.org. In addition to primary data, where the questionnaire of KSA includes 20 dates manufacturing companies selected randomly.

Results and discussion

Production indicators of dates in Saudi Arabia

Kingdom of Saudi Arabia represents the third world producer (Eleid, 2008). The Saudi farmers have accumulated experience for dates cultivation and for dates varieties from one generation to other.

In the last decade, KSA pay more attention for date palm cultivation (Lado et al., 1992). It is clear from Table 1 that the dates production has a minimum level about 527.9 thousand ton in 1990 and a maximum level by about 1 million and 78 thousand ton in 2010.

According to Table 1, Eq. (1) refer to yearly increase in dates production by 39.9 thousand ton and by rate of increase about 5.5% of total production during the period of 2000–2010. The results show also that 95% of changes in total production return to the factors that related to the time and about 5% return to others factors, which were not consider in the equation. The values of Durbin–Watson and F test describe the suitable model for estimation production trend.

By studying the trend of productivity of dates during the period of 2000–2010, the results show insignificant decrease according to Eq. (2). The values of F test and Durben–Watson are unsuitable for the model of estimation productivity trend of dates. This is accepted with the real fact that productivity of dates in Saudi Arabia changes around the average (6.3 ton/ha).

The results show also that 93% of changes in total area return to the factors that related to the time and about 7% return to others factors, which were not considered in the equation. The values of Durbin–Watson and F test describe the suitable model for estimation area trend.

Relative importance of dates varieties in different production areas of KSA

KSA has many varieties of dates. The varieties of dates change according to the different environmental situation of production areas in KSA.

By studying the relative importance of dates tree varieties according to the production areas, the result shows that about 97% of Khalas concentrate in two region Eastern province (60%) and Riyadh & Qasseim (33% & 4%). Where Ruzeiz is concentrate in eastern province by about 84% and in Riyadh by about 6%. Sukkari is concentrated in Qasseim by about 86% then in Riyadh by about 10%. Barhi is concentrated in Qasseim by about 50% then in Riyadh by about 33%, where Meneifi is concentrated in Riyadh by about 94% and Qasseim by about 4%. For Sullaj is concentrated in Riyadh by about 97% and in Qasseim by about 2%. Nabtat Seif is concentrated in Riyadh by about 86% and in Qasseim by about 6% then Hail by about 5%. Finally, Hulwa was concentrated in Hail, Jouf, Madina, Eastern province, and Riyadh by about 36%, 25%, 15%, 5%, and 4% respectively.

Market chain of Saudi dates

Marketing system of Saudi dates includes two types. The first one is traditional marketing system, and the second is modern marketing system in the new cultivated area. Most of Saudi farmers depend on traditional marketing system. Traditional marketing system is famous in the traditional cultivated areas especially in eastern province with small farm size (1000–20,000 M²) and old trees (more than 30 years). The traditional marketing system depends mainly on selling dates without making the important marketing services. The most farmers in traditional areas only sort the dates into two parties, first for human and second for feeding animal and sell the production after obtaining their annual needs. Some times, they sell their production for traders above trees or in the whole market or at dates factories. This marketing system causes multiple problems such as the following:

Table 1 Trend equations of production, productivity, and area of dates in Saudi Arabia during 2000–2010. (Area: Hectar, productivity: Ton/Hectar, Production: Ton). Source: calculated of Table 1 in index.

| Number | Equation | Equation | R^2 | F | Durbin–Watson | Significant |
|--------|--------------|---|-------|-------|---------------|-------------|
| 1 | Production | $\hat{Y}_i = 421136 + 39960 X_i$ (15.66) | 95.3 | 245.3 | 0.48 | ** |
| 2 | Productivity | $\hat{Y}_i = 6.81 - 0.0723 X_i$ (1.9) | 23.5 | 3.68 | 0.56 | – |
| 3 | Area | $\hat{Y}_i = 62051 + 7319 X_i$ (12.48) | 92.8 | 155.6 | 1.08 | ** |

Where: \hat{Y}_i = Estimated value of dependant variables in year i .
 X_i = Time as an independent variable.
 The values between the two brackets refer to T test value.
 ** Refer to the significant of dependant variable at 0.01 significant level.

1. Obtaining unstandardising, upgrading dates.
2. Increasing the quantity of dates with undetermined varieties or multiple varieties (mowahed), which decrease the marketing efficiency of Saudi dates and decrease farmer prices.
3. Crowded of farmers in the whole market same at harvesting season to sell their production without power of cooperative producers society.
4. Low prices as a result of big surplus of dates.
5. Increase the percent of microbial infected and insect contamination of dates as a result of unrefrigerating storage.
6. Increase the percent of impurity ratio.
7. Increase the refused quantity for manufacturing dates in Saudi Arabia.

The modern system is the second marketing system of dates in Saudi Arabia. This marketing system is famous in the new trade farms in Riyadh and Qasseim. The modern system is famous in big farms size (more than 20,000 M²). The modern marketing system depends on making different marketing services (sorting, grading, packaging, transporting, storing, and manufacturing) to improve quality assurance and making add value for dates. This modern marketing system includes making *harvesting, sorting, standardising, grading, washing, packaging, storing, transporting, and selling.*

The farmers of Madina depend mainly on the modern marketing system because of the high prices of Madina dates varieties (60–120 SR/kg).

Although there are about 400 dates varieties in KSA, the economic varieties are about 50 or 60 varieties. There are two possibilities of obtaining dates fruit, one as Rotab, which can be obtain at July and August and dates, which can be obtain at September and October. It is possible to describe marketing system of Saudi dates as Fig. 1.

Trend of manufacturing products of dates

About 90% of world dates is consumed as fresh product, where only 10% of total production is manufactured (Eleid, 2008).

It is important to achieve a strong Saudi dates industry. This needs a strong scientific research for using new technology for dates industry (The Cooperation Council for the Arab States of Gulf, 1985). This strong dates industry can decrease the fluctuation of dates prices, achieve stability, keep it out

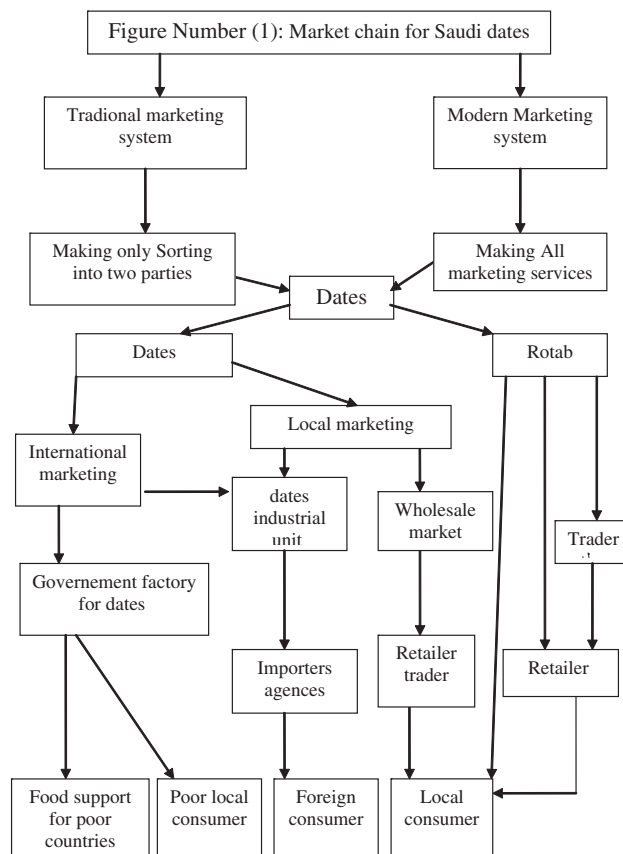


Fig. 1 Market chain for Saudi dates.

of decrease, and use the surplus of it for manufacturing products in Gulf countries. One of the most disadvantageous factors is using foreign material for packaging dates and dates products from Italy and China in addition to depend on the foreign technology from USA to EUC in the Saudi dates factories. This is one of the important weakness of Saudi dates industry especially with the potential increase in cost for these technology and materials.

By studying manufactured dates, the results show that about 90% of manufacturing activities concentrate on packaging process instead of producing dates manufacturing products (Eleid, 2008). The most important varieties of dates used for

manufacturing process are khalas 16%, Ruzeez 21%, Khodry 15%, Sukkari 10%, and others 38%. The results show insignificant of increase in trends for dates manufacturing products such as Paste, Jam, and Molass (Table 2). The results show also insignificant decrease for the trend of Paste, Jam, Foragea, Vineger, Molass and other products, but the result of total manufacturing dates is significant as a result of the high significant of packaging dates. So, the results of statistical analysis ensure the weakness of manufacturing Saudi dates and dates manufacturing sector, which depend mainly on packaging dates in addition to unused of full manufacturing ability of Saudi factories. In reality, most factories prefer to packaging dates because it is a simple process, profits quickly, and has low risk compared with the real processing products instead of processing it to more added value products. Therefore, it is important to determine the most important problems obstacle processing products of dates in Saudi Arabia.

Private and public investment for processing dates in K.S.A

In reality, there is a huge investment in dates sector for production marketing and manufacturing. There are two kind of Public investment.

The most important public investment is Governmental factory for dates in Alhassa. The government established this factory for supporting farmers and to ensure minimum limit for dates prices. The factory packages dates and submits it to the local low income people or for international food program as gift for poor countries (see Table 3).

Private investment for dates manufacturing is multiple and variance. Table 4 describes the most important private investment and their activities.

Private investment differs from factory to other. The minimum private investment in dates manufacturing was 1.6 million SR for Sana El nakhel for packing dates with 13 workers. The maximum investment was 67 million SR for Mohamadia factory, which includes 79 workers.

All factories depend mainly on packing activity and packing for others (farmers) by about 2 SR per kg. Only 56% of dates factories produce dates products such as Paste, Jam, Molass, Vinegar, Foragea, biscuit, and other products.

Relative importance for the important sources of dates for Saudi factories

According to statistical analysis of the research sample, there are many sources for dates for factories in Saudi Arabia. The best source for dates in quality was buying from farmers directly, followed by traders. The lowest quality of dates was dates that came from the wholesale market. So, the factories depend by about 70% of their production on dates submitted from farmers themselves. 25% of factory production of dates depends on dates submitted from traders, and about 5% of manufactured dates from the wholesale market.

The important problems facing processing of dates in KSA 2009

There are many problems obstruct manufacturing of dates in KSA

Table 5 describes the results of case study from KSA, which include twenty manufacturing companies selected randomly from the most important production regions (Eastern province, Riyadh, Qasseim, Madina) confirm that there are ten important problems effecting negatively on dates manufacturing process. The most important effecting problems were as the following:

1. Fail to inter EU and other markets of developed countries because of the high level of infected bacteria dates. So, it is important to apply quality management in manufacturing process according the world level to meet foreign consumer oversees.

Table 2 The dates processed by ton during the period 2003–2008. *Source:* Ministry of agricultural, ministry agency for research and development, administration of studying, planning and statistics, 2010.

| Years | Paste | Jam | Foragea | Vinegar | Molass | Other | Packaging dates | Total |
|-------|-------|-----|---------|---------|--------|-------|-----------------|-------|
| 2003 | 3508 | 0 | 590 | 67 | 170 | 8223 | 35746 | 48304 |
| 2004 | 10116 | 343 | 2357 | 105 | 1479 | 2705 | 53377 | 70482 |
| 2005 | 8778 | 305 | 1598 | 250 | 1350 | 1524 | 58386 | 72191 |
| 2006 | 7165 | 242 | 681 | 78 | 858 | 2257 | 81322 | 92603 |
| 2007 | 6809 | 304 | 972 | 106 | 836 | 2374 | 81838 | 93239 |
| 2008 | 6265 | 307 | 1179 | 0 | 676 | 2765 | 72358 | 83550 |

Table 3 Time trends for the dates processed products during 2003–2008. *Source:* calculated from Table 2.

| Number | Products | Equation | R^2 | F | Significant |
|--------|-----------|---|--------|--------|---------------|
| 1- | Paste | $\hat{Y}_i = 6881.7 + 64.3 X_i (0.1)$ | 0.03 | 0.011 | Insignificant |
| 2- | Jam | $\hat{Y}_i = 114.7 + 38.7 X_i (1.4)$ | 0.33 | 1.9 | Insignificant |
| 3- | Molass | $\hat{Y}_i = 884 - 3.1 X_i (0.03)$ | 0.0002 | 0.0006 | Insignificant |
| 4- | Vinegar | $\hat{Y}_i = 151.4 - 14.4 X_i - (0.69)$ | 0.11 | 0.48 | Insignificant |
| 5- | Foragea | $\hat{Y}_i = 1442 + 60.8 X_i (0.35)$ | 0.17 | 0.12 | Insignificant |
| 6- | Other | $\hat{Y}_i = 6063 + 2036 X_i - (1.51)$ | 0.36 | 2.2 | Insignificant |
| 7- | Packaging | $\hat{Y}_i = 34699.9 + 8325 x (3.4)$ | 0.74 | 11.6 | Significant |
| 8- | Total | $\hat{Y}_i = 50236.9 + 7568.9 X_i (3)$ | 0.70 | 9.19 | Significant |

Table 4 The main products of the important factories for dates in Saudi Arabia in 2009. *Source:* the study sample.

| Area | Number | Factory name | Important products |
|--------------------------|--------|-----------------------------------|---|
| Eastern province factory | 1 | Elgazera factory | Molass, packing dates |
| | 2 | Alhassa company for food industry | Paste, Molass, packing dates, foragea, sweet products |
| | 3 | Elrafai factory | Packing dates |
| Riyadh | 1 | Nakhel Elsaudia | Packing dates, foragea |
| | 2 | Dorat Eltamr | Packing dates, foragea, Molass |
| | 3 | Bsaten Elnakhel | Packing dates, Molass |
| | 4 | Elothmania factory | Packing dates |
| | 5 | Hager factory | Packing dates |
| | 6 | Elaclabe dates. | Packing dates |
| | 7 | Aml Elkher factory | Packing dates, foragea, Molass |
| | 8 | Tmor Elmamlaka | Packing dates, foragea, Molass, sweet products |
| Elkhrgh factory | 1 | Elfaisalia dates factory | Packing dates |
| | 2 | Elkhrgh dates factory | Packing dates |
| | 3 | Elkhergh for packing dates | Packing dates |
| | 4 | Mohamadia dates | Paste, Molass, packing dates |
| | 5 | Wady Haniva dates factory | Paste, Molass, packing dates, foragea |
| | 6 | Sana for packing dates | Packing dates |
| | 7 | Negmat Elmadaein for dates | Packing dates |
| Qasseim | 1 | Nazed factory | Packing dates |
| Madina | 1 | Elmadina Elminawara for dates | Packing dates without seed and with cobnut & almond and chocolate |

Table 5 Relative importance of processing problems for Saudi dates. *Source:* Data from research sample 2009.

| Ranking | Evaluated score | Relative importance of the problems | | | Problems | Suggestions for solving the problems |
|---------|-----------------|-------------------------------------|---------|------|--|---|
| | | Low | Average | High | | |
| 1 | 2.75 | 1 | 3 | 16 | Fail to inter EU market because of bacteria infected | Applied quality management and standardization |
| 2 | 2.6 | 2 | 4 | 14 | Increase the yearly cost of workers in additional to insufficient of efficient workers | Changing the working low to permit short visa for workers instead of 1 year visa to reduce the cost |
| 3 | 2.5 | 3 | 4 | 13 | <i>Obtaining unstandardising, ungrading</i> dates from farmers, which increase the cost for factories to standardize and grade | Improve marketing efficiency by learning farmers how to adapt marketing services especially standardization |
| 4 | 2.4 | 4 | 4 | 12 | Adulteration of small illegal dates manufacturing. Such as using low quality dates in manufacturing process | Improve the regulation against adulteration factories and organizing the trade system for importing dates |
| 5 | 2.35 | 4 | 5 | 11 | Price increase for imported plastic raw material of packing dates | Building the national packing raw material for supporting dates sector |
| 6 | 2.15 | 6 | 5 | 9 | Inefficient of mechanical for removing kernel of dates and cost more by using manual | More scientific research to improve manufacturing process by local technology |

- Increase the yearly cost of factory workers in the light of working only for 4–6 month during the harvesting season, so factory owners like to have seasonal workers for 4–6 month instead of 1 year visa to reduce the insurance, accommodation, and visa cost. Therefore, the government can solve this problem by changing the working low to permit short visa for workers instead of 1 year visa
- Insufficient number of efficient workers, so it is important to support dates sector with efficient workers to increase the processing efficiency.
- Obtaining unstandardising, ungrading* dates from Saudi farmers leading to increase the cost for factories. So, this problem can be solved by helping the farmers to adapt marketing services especially standardization and grading of dates to improve marketing efficiency for Saudi farmers.
- Adulteration of small illegal dates processing Units by using low quality imported dates, which effect negatively on repetition of Saudi processed dates. So, the Government has to improve the low to protect the Saudi dates processing sector.

- Increase in manufacturing cost for dates industry represented in imported plastic raw material of packing dates. This high cost of packaging represented in price of raw material of plastic packaging from Italy and luxury packaging from china increase the dependence of the Saudi dates industry on foreign raw material and decrease the independence of the Saudi dates industry. This problem can be solved by building the national packing of local raw material for supporting dates manufacturing.
- Removing kernel of dates or grading dates mechanically is inefficient because it takes parts of dates with kernel, this leads to a loss and so manual processing is required. But removing the unnecessary parts manually needs efficient workers and high cost. This can be solved by more scientific research to improve manufacturing process by local technology.

All the previous problems are important in most Saudi dates factories and need to be solved by the cooperation of government, manufacturing sector, and farmers according to some previous solutions of Table 5 to achieve more modern marketing and processing system of Saudi dates. This modern marketing and processing system needs to achieve some important advantages of Saudi dates such as:

- Saudi farmers have to adopt production and marketing services for *obtaining sorting, grading, and standardising*.
- Processing more percentage of dates into new manufactured products for increasing the add value instead of packaging it.
- Decreasing the quantity of dates with undetermined varieties or multiple varieties (mowahed), which decrease the marketing efficiency.
- Decreasing the crowded of farmers in the whole market at harvesting season for selling their production.
- Increasing prices as a result of add value of marketing services.
- Decreasing the percent of microbial and insect contamination.
- Decreasing the percent of impurity ratio.
- Decreasing the refused quantity for processing dates in KSA.

Technical advantage and disadvantage of dates varieties during marketing and manufacturing process

- Sukkari*: Sukkare is sold kind and famous with the good sweet test as result of higher percent of sugar and can be storage for long time (more than 1 year). One of the important problems facing manufacturing of Sukkari is distraction of the plastic packaging as a result of interring air inside the packaging. Moreover, it has a problem during manufacturing process, where the dates peel destroyed as a result to contact on transport belt.
- Khalas*: it is soft kind and Gulf countries prefer Khalas because it is well-known with the good test. It has a high ability of storaging. Khalas from eastern province is famous with good test and black color, but Khalas from Riyadh, Elkhrgh, and Qasseim is famous with yellow color.

- Elsheshe*: It is of soft kind, the most important problem of sheshe is changing its color to black with storaging, and it becomes more solid with longer storage period.
- Rezez*: It is soft kind. Rezez is distinguished with high level of juice, so it is suitable for producing Debs (date syrup Molass). Small size and black color are the important problems facing manufacturing Rezez. Major Rezez dates are very old trees, so the fruits are small and black. So, it is important for re-cultivation of Rezez to obtain better fruits, especially in the eastern province.
- Khedary*: Khedary is famous with big size in addition it is easy to open without breaking and without endangering the fruits. It is suitable for exporting to Europe by stuffing nuts or almond or chocolate instead of kernel. But it has a problem during manufacturing process, where the dates peel destroyed as a result of contact with transport belt.
- Elkhashram*: Asian countries prefer Elkhashram, but it has a problem during manufacturing process, where the dates peel destroyed as a result to contact on transport belt. Out of the sample study and the secondary marketing data, the results of study show that the preference of consumers changes according to the culture of the consumers. Some dates varieties are suitable for Arabic and Gulf countries, some for Asian, and others are suitable for European countries. So, the demand quantity of any dates varieties depends on consumer's culture and chemical and morphology characteristic of dates varieties. So, it is important to organize the plan of cultivation Saudi dates varieties according to the local and foreign consumer in the light of manufacturing problems of dates varieties and preferred chemical and morphology characteristic of dates varieties.

The most important varieties of Saudi exported dates

Table 6 explains relative importance of major varieties of dates exported to foreign markets according to the research sample. From previous table, it is clear that the exported quantity of Saudi dates to others Gulf countries is about 24% of total

Table 6 suitable dates varieties for manufacturing process. Source: Analysis of sample data of KSA.

| Manufacturing dates products | Suitable varieties |
|---|--|
| Packaging dates | Khalas Elsheshe Elshagra Rosana SAfawe Nabutsaif Maktome |
| Debs (obtain 40% date syrup Molass). | Rezez |
| Date paste(1.5 tonne date produce 1 ton paste 0.67%). | Mowahed (multivarieties together) |
| Varieties processed with stuffing nuts, almond or chocolate instead of kernel | Mowahed (multi-varieties together) Saqei Khedary |

Table 7 Important preferred varieties of Saudi dates exported to foreign markets. *Source:* Analysis of sample data of Saudi processing units 2009/2010.

| Import markets | Exported Saudi dates (%) | Preferred dates varieties | Description of the market |
|---------------------------|--------------------------|------------------------------------|---------------------------|
| Gulf countries | 24 | Khalas, Rezeiz, Elsheshe | Traditional markets |
| Yamen | 49 | Mowahed (Multi-varieties together) | Traditional market |
| Syria, Lebanon and Jordan | 12 | Khedary, Saqei | Traditional markets |
| Asia | 5 | Saqei, khashram, Barhi, Menife | New and promising markets |
| Europe | 2 | Khedary, Saqei and Berni. | New and promising market |
| Other countries | 8 | Mowahed (Multi-varieties together) | Other countries |

Saudi dates. Out of sample study, the consumers in Gulf countries prefer dates varieties of Khalas, Rezeiz, and sheshe, While Yemen consumers prefer Mowahed (Multi-varieties together) with low prices. Yemen is considering the largest import country for dates from Saudi Arabia. The percentage of Yemen imports from Saudi dates is about 49% of total Saudi date exports in 2008. Syria, Lebanon, and Jordan import about 12% of total Saudi dates export in 2008 (see Table 7).

The most preferred significant varieties for Syria, Lebanon, and Jordan are khedary and Saqei. By studying the new promising market, which is the Asian countries, the study results show that consumers in this area prefer the khedary, Saqei, khashram, Barhi, and Menife varieties, while the most significant items exported to Europe area are khedary, Saqei, and Berni. Consequently, every foreign consumer group prefer the suitable types of Saudi dates according to size, color, and suitable level of sugar, so it is important to cultivate the suitable dates varieties for foreign consumers.

Consequently, every foreign consumer group prefer the suitable types of Saudi dates according to size, color, and suitable level of sugar, so it is important to cultivate the suitable dates varieties for foreign consumers according to strategy plan for improving production and marketing of Saudi dates

aiming to improve the exported percent of total dates production, which is very limited (5%) for the third world producer.

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