COMPARISON OF CHEMICAL PROPERTIES OF KABKAB AND SHAHANI PALM KERNEL.

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Abstract
Date is one of the most important products of dry and semi-dry parts of the world. The components in palm kernel are important as it can be used as an animal feed. However it can be used in variety of food products such as caffeine-free beverages, coffee substitute and also in some traditional medicines. In this project the kernel of two different types of dates (Kabkab & Shahani) were separated from date fruit and after the process of washing, drying and grinding they analyzed for identifying their chemical components. The results showed the kernels consist of an average of 10.5% moisture, 5.56% of protein, 12.59% of lipid, 62.18% of soluble fiber in acidic solutions and finally 1.35% of ash. Analysis of kernels oils by gas chromatography showed that oleic acid (40.15%) is prevailing saturated fatty acid in kernel oil and after that lauric acid (23.2%) had the most saturated fatty acids. Other fatty acids consist of MIRISTIC acid (11.72%), PALMITIC acid (11.42%), LINOLEIC acid (8.54%) and STEARIC acid (3.2%).

Keywords: Chemical Properties, Kernel, Palm and kabkab.

INTRODUCTION
Since thousands of years till date is known as one the most important food. High calorie in date and the easy storage of this fruit make it to be an important product in places which it grow (Maser, 1996). Date is one of the most important products in dry and semi-dry parts of the world and it has an important industrial role for the people of those countries (Al-Hooti et al., 1995; Hussein et al., 1995; Mohamed et al., 1983; Rygg, 1996). Date had been used by human being as an important and valuable food from 6000 years B.C. Archeologist believe that date cultivation in Iran started from Achaemenid era (Javad, 2002). In the year 1384 H. S. Iran with the total products of near 997 ton a year (about 17 percent of total production in the world) was one of the most important manufactures countries. The total land under 2 cultivation for this product in Iran is more than 171000 hectare and it is cultivated in 12 different provinces. Chemical composition and nutrition value of date had been studied by researchers (Salem & Hegazi, 1971). Palm kernel consists of 15 to 16 percent of whole fruit (Al-Showimian Salim, 1990; Besbes a et al., 2005; Besbes b et al., 2005). Studying the components in palm kernel is important as it can be used animal feed especially for cow, sheep, camel and chick. Also it can be used in different food products like caffeine free beverages, coffee substitution and traditional medicines (Al-Hooti et al., 1998; Al-Qarawi et al., 2005; Al-Showimian et al., 1995; Devshony et al., 1992). Palm kernel is a waste products of date processing industries like industries which produce date powder, date sap, date with chocolate coating an date sweet (Al-Hooti et al., 1997; Hobani, 1998; Khatchadourian et al., 1983). Palm kernel has 5% to 10% of total solid content, 5% to 10% of moisture, 10% to 20% of crude fiber, 55% to 83% of carbohydrate and 1% to 2% of ash (Besbes et al., 2004).

MATERIAL AND METHODS
First the variety of Kabkab with dark brown color and drawn and large shape was brought from boshehr and the variety of Shahani with light brown color and a thin shape was brought from jahrom to food science lab. Second the fruit was separated from palm kernel by hand and the palm kernels were soaked in water for 48 hours and after drying in room temperature they grinded with a hammer mill to pass the sieves with 1 millimeter sizes. Then the powders were put in the refrigerator up to the time of our tests.

The average of moisture, oil, ash and soluble fibers in acidic solution was measured by standard analytical methods from AOAC (Al-Farsi, 2007). To detect the profile of fatty acids first the extracted oil from palm kernel was Methyalted by alcoholic potash (Maser, 1996) and then it was measured by gas chromatography, model GC Clarus 480 made of PerkinElimer company united states, in the temperature of 198 C and FID detector and injector in 250 C.

RESULTS AND DISCUSSION
Palm kernel in both two varieties of Kabkab and Shahani has an average of 10.5% Moisture, 5.56% protein, 12.59% fat, and 62.18% soluble fiber in acidic solution and 1.35% of ash.
To the above figures protein and carbohydrate consistent of Kabkab and Shahani samples did not have significant differences (p <0.05) but the amount of ash, soluble fiber in acidic solution, fat and moisture had significant differences (p<0.05). Palm kernel of Kabkab had more amount of moisture, protein and carbohydrate but less amount in fat, soluble fiber in acidic solution and ash compare to Shahani variety.

**MAJOR FINDINGS**

Analysis of palm kernel oil with gas chromatography showed that oleic acid is the major unsaturated fatty acid in palm kernel (40.15%). After oleic acid lauric acid had the highest unsaturated fatty acid (23.2%). Other fatty acids consists of Miristic acid (11.72%), Palmitic acid (11.42%), Linoleic acid (8.54%) and stearic acid (3.2%). Palm kernel of Kabkab variety had no caprisric acid and Shahani variety had no arachidonic and Linoleic acid in their composition. In (p<0.05) statistical differences the palm kernel of two varieties had no significant differences in the amount of resinoleic, oleic and palmitic fatty acids but the amount of other fatty acids had significant differences (p<0.05).

**CONCLUSION**

Oleic acid with 40.15% is major unsaturated fatty acid in palm kernel. Kabkab Palm kernel had no capric acid and Shahani variety had no arachidonic and Linoleic acid otherwise. The type of Kabkab in our research had generally more amount of moisture, protein and carbohydrate and less content of fat, soluble fiber in acidic solution and ash compare to Shahani variety.

**References**