A study on Sunflower oil quality in different seasons

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Abstract:
Sunflower oil is important oil for cooking purpose in India. So many important vegetable venders and packers are suggesting to public health for good health. In India vegetable oils are trading under Agmark specifications. The present research study focused on the different seasonal effects on Sunflower oil quality.

Key words: Sunflower oil, Agmark Specifications, Refractive Index, Acid Value, Saponification Value, Iodine Value, Halphen's Test.

Introduction:
Sunflower oil is the non-volatile oil compressed from sunflower (Helianthus annuus) seeds. Sunflower oil is commonly used in food as a frying oil, and in cosmetic formulations as an emollient. Sunflower oil was first industrially produced in 1835 in the Russian Empire.[1][2] The world's largest sunflower oil producers now are Ukraine, Russia and Argentina.[3] Sunflower oil is a monounsaturated (MUFA)/polyunsaturated (PUFA) mixture of mostly oleic acid (omega-9)-linoleic acid (omega-6) group of oils. The oil content of the seed ranges from 22 to 36% (average, 28%): the kernel contains 45–55% oil. The expressed oil is of light amber color with a mild and pleasant flavor; refined oil is pale yellow. Refining losses are low and the oil has good keeping qualities with light tendency for flavor reversion. The oil contains appreciable quantities of vitamin E, sterols, squalene, and other aliphatichydrocarbons**.** Sunflower oil is liquid at room temperature. The refined oil is clear and slightly amber-colored with a slightly fatty odor. Sunflower oil is containing the following triglyceride. Palmitic acid (saturated): 5%,Stearic acid (saturated): 6%, Oleic acid (monounsaturated omega-9): 30%, Linoleic acid (polyunsaturated omega-6): 59%

Materials and Methods:
For this study the sun flower samples are collected from local super markets with different brands. The required chemicals (Merck, analytical grade) are purchased from local venders Hyderabad. The collected samples are analyzed with ISO methods and compared with Agmark specifications. Every test was analyzed three times for accuracy. The RSD values of three reports are below 2.0.

Results and Discussion:

S.No	Sun Flower Oil	Grade	Agmark Specification	January-2014 Samples	May-2014 Samples	September-2014 Samples
1.	Moisture & Insoluble Impurities%	Rd G I	0.1 0.25	0.04±0.58	0.03±0.37	0.06±0.29
2.	Colour Y+5 R (1"cell)	Rd G I	5 20	3.5±0.62	3.6±0.73	3.2±0.83
3.	Specific gravity at 30/30	Rd G I G II	0.913 to 0.918	0.917±0.12	0.915±0.25	0.912±0.34

4.	Refractive Index at 40^{o}C	Rd G I G II	1.4640 to 1.4800	1.4664±0.05	1.4653±0.02	1.4659±0.04
5.	Acid Value	Rd G I	0.5 3.0	0.16±0.44	0.22±0.71	0.19±0.58
6.	Saponification value	Rd G I	188 to 194	190±1.02	192±0.48	191±0.62
7.	Iodine value	Rd G I	100 to 140	135.1±0.37	130.4±0.66	132.6±0.74
8.	Unsaponifiable matter	Rd G I	1.5	0.81±1.05	0.72±1.18	0.85±1.26
9.	Test for Mineral Oil by TLC	Rd G I	Absent	NA	NA	NA
10.	Test for Castor oil by TLC	Rd G I	Absent	NA	NA	NA
12.	Test for Argemone Oil by TLC	Rd G I	Absent	NA	NA	NA

Table.1 Analysis data of sunflower oil in different seasons

From results in Table .1 Moisture, Iodine value, Unsaponifiable matter, Refractive index values are less in summer. In study location in summer season the temperature ranges are 42^{o}C-48^{o} C. Due to high temperature these important parameters are showing variation. At the same time color, specific gravity, Acid value, saponification values are higher in summer. But the noticeable concept is all values are varying in between acceptable ranges. So there is no environment temperature effect on sunflower oil quality.

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