

QUALITATIVE ANALYSIS OF PURE AND MARKET GHEE SAMPLES

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ABSTRACT: Ghee is the clarified butter obtained from the milk of buffaloes; cows, goats and sheeps. It is prepared by melting the butter, boiling off the moisture and decanting the clarified fat. Consumers love its distinct flavor. In order to ensure a genuine product to the consumer, the Government of India has prescribed the compositional standards for ghee, under PFA act and Agmark rules. But, unfortunately, the producers or the middle-men involved in the ghee trade, inn their greed to have more money, tend to adulterate ghee with cheaper oils and fats like vegetable oils, animal body fats, hydrogenated fats, and sometimes even the non edible mineral oils, especially during lean season. The most intricate problem facing the ghee industry today is its widespread adulteration, especially with hydrogenated and refined vegetable oils. This has adversely affected both the consumer and the producer.

Introduction:

It is known in different countries with different names such as 'maslee' or 'samm' or 'samna' in Egypt and Israel, 'Roghan' in Iran, and 'Dahinhurr' in Iraq. Butter oil, popular in western countries, is slightly different from ghee as the former has bland flavor. The origin of ghee making lies far beyond recorded history. The word ghee itself stems from old Sanskrit word 'ghrit' which means bright or to make bright. When sprinkled on fire, butter fat enhances its

Brightness.

India's ghee trade is as old as agriculture. Owing to the distribution of 95 per cent of total population of animals in villages, maintained by small producers, generally in herds of 2 or 3 animals ghee industry assumes a special importance as a cottage industry. In rural areas, remote from the cities and towns where facilities for sale or fluid milk are wanting the cultivators have to convert surplus milk into ghee as it is the only rational method of preserving milk fat without deterioration for fairly long periods.

Ghee has a high smoke point (250 °C or 482 °F). It can cook and fry with ghee and it will not break down into free radicals like many other oils. Ghee is rich in butyric acid which is great for healing the gut. Research shows that adequate production of butyric acid supports the production of killer T cells in the gut, and thus a strong immune system.

Solidifying Nature:

Solidifying point is defined as the temperature at which fat shows first sign of appearance of solid phase on cooling. Solidification temperature of milk fat depends very much on the procedure employed for cooling (Webb *et al.*, 1987). Rahn and Sharp (1928) reported solidification point of 19.7 and 23.6°C for samples of the same milk fat cooled by immersion at 14 and 20°C, respectively

Much like coconut oil, ghee is rich in medium chain fatty acids which are absorbed directly to the liver (like carbs) and burned as energy. Athletes can use ghee as a consistent energy source. The energy from these medium chain fatty acids can be used to burn other fats in the system and lose weight. Ghee nourishes the brain, helps inflammation and feeds our immune system. Ayurvedic physicians have used oral butyrate supplements and butyrate enemas to treat inflammatory bowel diseases such as Crohn's and ulcerative colitis for centuries. Ghee is made from butter but the milk solids and impurities have been removed so most people who are lactose or casein intolerant have no issue with ghee.

Materials Required:

Materials used for the above experiment include various types of ghee samples available in the market labelled for convenience sample A,B,C,D,E and F

Equipment: Test tubes, Watch glasses, Glass rods and others include → (cotton plugs used in place of stoppers for test tubes), Spatula & Spirit lamp

Chemical s: Conc HCl , Diethyl Ether, Iodine solution

Methodology: The Samples (about 5ml) each should be taken separately in separate test tubes labelled A,B,C,D,E & F then the ghee samples are melted using spirit lamp. About 5ml of Conc HCl is added to each of the samples & about 0.1% to all the test tubes and observed for a colour change after 10-15mins.



Fig a: Test for adulteration with vegetable oil



Fig b: Test for adulteration with sweet potato/starches



Fig c: Test for adulteration with old/rancid ghee



Fig d: Conducting Tests for adulteration

TABLE: A

| S.no | Testing for adulteration with vegetable oil | Observation | Inference |
|------|---|-----------------------------------|---|
| 1. | Sample- A (Market ghee sample) | Red color was observed | Sample was adulterated with vegetable oil |
| 2. | sample -B (Market ghee sample) | Reddish brown color was observed | Sample was adulterated with vegetable oil |
| 3. | sample -C (Market ghee sample) | Red ppt was settled at the bottom | Sample was adulterated with vegetable oil |
| 4. | Sample- D (Market- Vanaspati ghee sample) | Pale red color was observed | Sample was adulterated with vegetable oil |
| 5. | sample- E (cow ghee/ market) | No color change was observed | No adulteration |
| 6. | Sample- F (pure ghee/ home made) | No color change was observed | No adulteration |

TABLE: B

| S.no | Testing for adulteration with sweet potato /other starches | Observation | Inference |
|------|--|----------------------------------|------------------------------------|
| 1. | Sample- A (Market ghee sample) | purple color was seen | Sample was adulterated with starch |
| 2. | sample -B (Market ghee sample) | Solution turned pale purple | Sample was adulterated with starch |
| 3. | sample -C (Market ghee sample) | purple color was seen | Sample was adulterated with starch |
| 4. | sample -D (Market- Vanaspati ghee sample) | purple color was seen | Sample was adulterated with starch |
| 5. | Sample-E (cow ghee/ market) | Slight color change was observed | slight adulteration |
| 6. | sample -F (pure ghee/ home made) | No color change was observed | No adulteration |

TABLE: C

| S.no | Testing for adulteration with old / rancid ghee | Observation | Inference |
|------|---|-------------------------------|---|
| 1. | sample -A (Market ghee sample) | Pale pink colour was observed | Sample was adulterated with old /rancid ghee |
| 2. | sample -B (Market ghee sample) | No colour change was observed | Sample was not adulterated with old / rancid ghee |
| 3. | sample -C (Market ghee sample) | No colour change was observed | Sample was not adulterated with old / rancid ghee |
| 4. | sample -D (Market- Vanaspati ghee sample) | Pale pink colour was observed | Sample was adulterated with old / rancid ghee |
| 5. | Sample -E (cow ghee/ market) | No colour change was observed | Sample was not adulterated with old / rancid ghee |
| 6. | sample -F (pure ghee/ home made) | No colour change was observed | Sample was not adulterated with old / rancid ghee |

Results and discussions:

From the above tables it is revealed that samples A,B,C,D are adulterated either with vegetable oil or starch or old/rancid ghee while the sample E (cow ghee/ market) is slightly adulterated with vegetable oil and starch and sample f(pure ghee/ homemade) has shown negative results for all the three successive tests.

Conclusion:

It is thus concluded that homemade pure buffalo ghee and cow ghee samples are proved to be the best samples without any adulteration.

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