



REVIEW ON DADHI AND MILK COAGULATION PROCEDURES IN AYURVEDA

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Received 25th Feb. 2021; Revised 26th Mar. 2021; Accepted 20th April. 2021; Available online 1st Dec. 2021

<https://doi.org/10.31032/IJBPAS/2021/10.12.5749>

ABSTRACT

Nutritional supplements and fortified food products are there is a demand like never before. Consumers are on the look for various nutritional products and foods that are healthy, palatable, nutritious and safe. Dairy products are one sect of food products that are healthy and nutritious and one among them is curd. It is a practice in Indian culinary to add curd in every meal. Ayurveda dietetics has also put light on the benefits of curd and its products in various treatises.

Dadhi is a fermented product that takes specific time to form. In text of Ayurveda one can come across references about formation of curd using different media is explained. By incorporating herbs for the formation of curd, the product is fortified with other phytochemicals making it richer. This is also proved by analytical researchers carried out.

This journal highlights the different ways of curd formation adopting various herbs as a media and the health benefits of it.

Keywords: Curd, coagulation, dadhi, milk, paneer, nutrition, ayurveda

INTRODUCTION

The health issues coupled with growing nutritional additives and improved sensory demand for food products fortified with properties have vastly attracted the

consumers attention in the recent past. The food industry is perpetually getting innovative to satisfy these demands by developing products based on multiple functional ingredients. Therefore, it is frequently seeking to supplement foods and beverages with phytochemicals, soluble and insoluble fiber, vitamins, minerals, essential fatty acids etc. The importance of herbal drugs and their inclusion in processed foods is also witnessing an upsurge as they are rich in phytochemicals, vital for achieving good health and prevention of chronic diseases, including cancer and cardiovascular diseases [1].

In Ayurvedic classics, depending upon the qualities of different solid and liquid food items, their benefits and probable hazards in different individuals has been described very well. Curd or Dadhi is grouped under liquid food items and gorasavarga (group of milk products). There are different qualities of curds based on the type of milk used. It is a fermented dairy product used since ages to gain lots of nutritional values and health benefits. For centuries Indian generations grew up adding curd in their food habits and religious ethos.

Curd or Dadhi is unctuous, hot in potency, sour in taste and vipaka, removes anorexia, stimulates appetite and digestion, grahi, aphrodisiac, sustains life and alleviates vata. According to Vagbhata curd is guru, ushna, sour in taste and vipaka, grahi and

decreases vata. It increases meda, shukra, bala, kapha, pitta, rakta, agni, removes anorexia and increases oedema in body. Curd is being used many preparations like five types of takra (buttermilk) prepared without and with addition of different ratio of water [2].

When sour is added in boiling milk, the acid present in the lime disturbs the pH level of the milk and the protein molecules begin to form large chains. These chains of protein molecules separate themselves from water molecules and form a sediment or chhena or paneer [3].

The key ingredient of paneer is, of course, milk. Fresh milk is an example of a colloid, consisting of fat and protein particles floating in a water-based solution, where Casein is the main protein component of milk. There are three major types of casein proteins. Alpha casein comprises 50-55% of the total casein. This protein has a hydrophilic (water-loving) centres surrounded hydrophobic (water-hating) ends and is extremely sensitive to calcium. The caseins are assembled into small spherical structures called micelles. They impart the white colour to milk; when they are removed, milk has yellowish green hue. They also contain 6% minerals, mostly calcium and phosphorus. If the calcium is removed from the micelle, it will then disassociate into subunits. Calcium is not required for the

primary stage (i.e., enzyme hydrolysis of -casein) but is essential to aggregation of the casein micelles. At low levels of calcium, the primary phase goes to completion. Subsequently, instantaneous coagulation can be induced by adding sufficient calcium chloride.

The colloidal suspension scatters light, causing milk to appear white. Milk is slightly acidic. When the pH is lowered addition of another acidic ingredient allows the protein molecules to stick together or coagulate into clumps known as curds. The watery liquid that remains is called whey. The clumping reaction happens more swiftly at warmer temperatures than it does at cold temperatures [4].

MATERIALS AND METHODS

Dadidugdhakruta

Kapitta (*Feronia limonia* L.) rubbed with water or swarasa of pakwa amra (juice of ripened fruit of *Mangifera indica*) or beeja (seed) of amra (*Mangifera indica*) phala (fruit) is rubbed with water and is applied to patra (vessel). To this vessel, if boiled milk is added it will be converted to curd.

Dadidugdhakruta

Tindidika (*Rhus parviflora* Roxb) rubbed with water or badaramlaswarasa (juice of *Ziziphus Mauritiana*) should be applied to vessel and dried. If boiled milk is added to this vessel it, will be converted into curd.

Daddhidugdhakrutha

Curna (powder) of kapittyaphala (*Feronia limonia* L.) is given bhavana with milk of buffalo and dried. If it is added takra (butter milk), immediately it will be converted into dadhi (curd) without water.

Dadidugdhakruta

Heated majja (pulp) of kapitya (*Feronia limonia* L.) is triturated with milk repeatedly and should be dried. To ikshu rasa (juice of *Saccharum officinarum*), little quantity of amalakicurna (powder of *Emblica officinalis*) should be added and dried powder of kapityamajja (pulp of *Feronia Limonia* L.) is to this ikshu rasa (juice of *Saccharum officinarum*) with amalakicurna (powder of *Emblica officinalis*). By this it will produce milk [5].

DISCUSSION

There is difference in method of preparation of panner and curd. In the preparation of curd, consumption of time is more and process of fermentation is involved. But in the preparation of panner, time of consumption is less and process of fermentation is not involved. In general, preparation of panner require sour fruit or drug.

This mechanism of coagulation of milk was known to ancient ayurvedic scholars. They have mentioned different herbal drugs which have sour taste for the curdling of milk. Kapitta (*Feronia limonia* L.), amra (*Mangifera indica*), Tindidika (*Rhus parviflora* Rox b), badara (*Ziziphus*

mauritiana), amalakicurna (powder of *Embllica officinalis*), ikshu (*Saccharum officinarum*) are the few examples for the same.

Plants are very important source of potentially useful bioactive principles for the development of new chemotherapeutic agents. The biological and pharmacological properties of many plants are still unknown. World over, the scientists are exploring the potential of utilizing pharmacologically active compounds from medicinal plants. Herbal medicines are used by 80% of the people worldwide due to its high efficiency, cheap cost, non-narcotic nature and fewer side effects [6].

The plants mentioned in the preparation of curd are having nutrients such as pectin, fibres, calcium, vitamin B and vitamin C, protein, phosphorus, magnesium, potassium, sodium, chlorine, Sulphur, palmitic acid, stearic acid, oleic acid, linoleic acid and linolenic acid and antidiabetic, anti-oxidant, anti-viral, cardiogenic, hypotensive, anti-inflammatory antibacterial, anti-fungal, anthelmintic, anti-parasitic, anti-tumour, anti-HIV, anti-boneresorption, antispasmodic, antipyretic, antidiarrheal, antiallergic, immunomodulation, hypolipidemic, anti-microbial, hepato-protective, gastroprotective properties [7-15]. Recent researches shows that milk coagulation using lemon and amla juice for the manufacture of paneer resulted in

considerable effect on the physico-chemical characteristics, functional components, sensory attributes, TPA and microstructure (SEM). Since both the juices contained a substantial quantity of phytochemicals, paneer coagulated using these exhibited higher magnitude of antioxidant activity, ascorbic acid, total phenols and tannins than control (citric acid). Sensory scores indicated that good quality paneer with high acceptability could be manufactured both from lemon and amla juice [16].

CONCLUSION

Curd or Dadhi is grouped under liquid food items and gorasavarga. There are different qualities of curds based on the type of milk used. It is a fermented dairy product used since ages to gain lots of nutritional values and health benefits. Milk is slightly acidic. When the pH is lowered even more by the addition of another acidic ingredient, the protein molecules stop repelling each other. This allows them to stick together or coagulate into the clumps known as curds. Milk coagulation using drugs of sour taste was mentioned by ayurvedic scholars long back in the books. Recent studies also proved that along with coagulation of milk, one will benefit of therapeutical properties of herbal drugs used for the coagulation. Recent

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