Research and Reviews: Journal of Dairy Science and Technology
ISSN: 2319-3409(online), ISSN: 2349-3704(print)
Volume 4, Issue 2
www.stmjournals.com

Potential of Herbal Nutraceuticals in Ghee: A Review

***Kamal Gandhi*[1]*, *Darshan Lal*[2]**
[1]Senior Executive, GCMMF Ltd. Anand, Gujarat, India
[2]Division of Dairy Chemistry, National Dairy Research Institute, Karnal (Haryana), India

Abstract

Food industries have rather high demand for the products that meet the consumer's demand for a healthy life style. In this context functional food fortified with the plant ingredients plays an important role. Ghee is widely used as carrier for herbs for efficient absorption of their functional components in ayurvedic medicines. Herbs like Vidarikand, Shatavari, Ashwagandha, Arjuna etc had been incorporated in ghee and were observed to have enhanced absorption of the active components present in them in the body increasing their therapeutic and functional benefits. Ayurvedic medicines being natural are devoid of any side effects and therefore capturing the attention of the researchers all over the world. The purpose of this review is to summarize the studies conducted so far on the ghee incorporated with herbs as the source of functional, therapeutic and antioxidant benefits.

Keywords: *Ghee (Butter oil), Vidarikand (Pueraria tuberosa), Shatavari (Asparagus racemosus, Ashwagandha (Withania somnifera),Tulsi (Ocimum sanctum L.), Arjuna(Terminalia arjuna), antioxidant activity*

****Author for Correspondence*** E-mail: kamalgandhi4444@gmail.com

INTRODUCTION

The fast pace of modern life style today causes great stress on our mind and health often leading to serious health disorders. Consumers have therefore become extremely conscious about the way their health care is managed, administered and priced. The consumers are now looking for complementary or alternative approach to health care. Ayurveda, the name made up of two Sanskrit words "Ayu" (life) and "Veda" (knowledge) that means the "science of life and the art of healing". It is one of the world's most ancient holistic health philosophy and system that cover almost every aspect of well being.

This system of health care has been practiced since ages and essentially involves well being of body and mind by increasing intake of beneficial natural products such as nutraceuticals either in the form of medicines or through regular diets. He rbal nutraceuticals are commonly used by peo ple who seek conventional health care.

Herbal remedies are also a part of this renewed public interest in seeking health solutions through alternative approach to conventional medication. Herbs have been used as food and for medicine for centuries. Herbal medicine is based on the concept that plants contain certain natural substances that can promote health and alleviate illness. Research interest has been focused on various herbs that possess hypolipidemic, anti-platelet, anti-tumor or immune – stimulating properties that may be useful adjuncts in reducing the risk of CVD and cancer. In different herbs, a wide variety of active phytochemicals including the flavonoids, terpenoids, lignans, sulfides, polyphenols, carotenoids, coumarins, saponins, plant sterols, curcumins and phthalides have been identified.

Ghee is almost an anhydrous milk fat having pleasing and appetizing aroma. It has been a staple in the Indian family kitchen for generations; for use in cooking, as well as a wide variety of medicinal applications. In Ayurveda, ghee is widely considered the best carrier or anupana when delivering healing to the deep tissues of the body. Its ability to penetrate all of the deeper tissues of the body makes it an excellent choice for strong, deep absorption. By cooking herbs in water and ghee, the resulting medicated ghee contains all of the water- and oil- soluble characteristics of the herbs extracted into the ghee.

FUNCTIONAL FOOD-EMERGING MARKET OPPORTUNITIES

Globally, there is a large and rapidly growing market for functional foods and food ingredien ts. Access to and growth in this market are creating an almost insatiable desire among food companies for new bioactive and multifunctional ingredients and new processing technologies for their isolation and incorporation into foods. Producing and marketing nutraceuticals and functional foods has become a big business. Conditions such as high cholesterol, high blood pressure, osteoporosis and diabetes have created a need for functional foods to manage/treat these conditions. With the majority of consumers trying to live a preventive lifestyle, fortified foods and beverages have quickly become a way of life. Consumers are making a strong effort to get more vitamin C, calcium, B vitamins, fiber, antioxidants, vitamin E, omega-3s/DHA/fish oil, vitamin A, potassium, iron, and folic acid from the food and beverages they consume.

HERBAL INGREDIENTS IN FUNCTIONAL FOODS

Herbal ingredients are among the key ingredients of functional foods and enjoy a good share in the functional food market. In US the annual sale of medicinal (functional) herbs and related commodities exceeds $2 billion. WHO estimates that ~ 80% of the earth inhabitants rely on traditional medicine for their primary health care needs, and most this involves the use of plant extracts or their physiologically active components. Today we are witnessing a great deal of public interest in the use of herb for dietary purpose. Herbal medicine is based on the premise that plants contain certain natural substances that can promote health and alleviate illness. Research interest has been focused on various herbs that possess hypolipidemic, anti-platelet, anti-tumor or immune stimulating properties that may be useful adjuncts in reducing the risk of CVD and cancer. In different herbs, a wide variety of active phytochemicals including the flavonoids, terpenoids, lignans, sulfides, polyphenols, carotenoids, coumarins, saponins, plants sterols, carcumins and phthalides have been identified. In herbal medicine the term "herb" is used loosely to refer not only to herbaceous plants but also to bark, roots, leaves, seeds, flowers and fruits of trees, shrubs and woody vines and extracts that are valued for their savory, aromatic or medicinal qualities. Ayurveda, the Indian traditional medicine science found several ways in which the medicinal benefits of herbs could be conveyed via certain foods as carriers. Ghee is one of the most important such carriers.

Need for Herbal Supplements

1. Sense of control, a mental comfort from taking herbs
2. Use for common problems – due to immediate unavailability of professional help, too inconvenient, costly or time consuming.
3. Role of cultural factors in rural areas such as concept of interplay between the environment and culture, a "man-earth" relationship [1].
4. Reports of adverse effects of conventional medications are found in the lay press at a much higher rate than reports of herbal toxicities.
5. Substances found in herbs, such as phenolic acids and their derivatives, furanocoumarins, alkaloids, lactones, polysaccharides and glycoproteins have similar action to steroidal ergotropics while having no adverse side effects.

Need for Herbs in Dairy Products

- Herbs provide natural antioxidant.
- It improves sensory attributes
- It acts as bio preservatives
- Product diversification is possible
- Provides functional properties like nutritional, antimicrobial, antioxidant and medicinal properties.

Selection of Herbs

Herbs are selected for Fortification in Functional Foods Based on the Following Properties

- sensory evaluation
- colour and appearance
- flavour, body and texture
- overall acceptability

Forms of Herbs Used

- herbal paste
- tray dried
- freeze dried

- solvent extracted

Drawbacks

With the slim chance of patent protection for the many herbs that have been in use for centuries, pharmaceutical companies have not provided financial support for research on the merits of herbal medicine [2].

GHEE AS THE CARRIER OF HERBAL NUTRACEUTICALS

Milk fat, particularly Ghee has the characteristics to absorb all the medicinal properties of the herbs with which it is fortified, without loosing its own qualities. Exploiting this concept several medicated ghee preparations has been developed and about 55–60 medicated ghee types reported in Ayurvedic literature and they are used in the treatment of various diseases [3]. Presently, the herbal ghee being marketed in the country is mostly sold as medicine for cure of certain ailments and is therefore classified as 'medicinal ghee'. They have typical flavour, bitter or pungent taste with a dark colour. Such therapeutic preparations are therefore not acceptable for routine use. Preparations which can serve as the health promoting items of the diet would therefore have to be essentially prophylactic foods based on the same principles. There is thus a need for developing processes for large-scale manufacture of ghee incorporating herbal properties, but without affecting sensory and physical properties. Furthermore, very limited information is available for ascertaining the residual levels of these functional components in herbal Ghee preparations. There also exists an ample scope to establish mechanisms through which these components impart health enhancing properties like anti carcinogenicity, anti atherogenicity etc in human subjects.

SOME COMMON HERBS WITH POTENTIAL FOR INCORPORATION IN GHEE

Mehta [4] reported that addition of methanol pre-extract of dehusked ragi powder (DRP) at the rate of 0.1%, 0.25% and 0.5% resulted in a corresponding increase (over control) in phospholipids content to about 2.15, 4.53 and 8.15 mg 100 g^{-1}) and water extractable phenolic content to about 0.52, 1.25 and 2.78 mg 100 g^{-1}) of ghee, respectively causing increased shelf life of ghee. Green tea is prepared by picking, lightly steaming and allowing the leaves to dry [5]. Catechins are highly potent flavonoids present in tea and serve perhaps as the best dietary source of natural antioxidants. Several catechins are present in significant quantities; epicatechin (EC), epigallocatechin (EGC), epicatechin gallate (ECG) and epigallocatechin gallate (EGCG) [6]. EGCG makes up about 10–50% of the total catechin content and appears to be the most powerful of the catechins with antioxidant activity about 25–100 times more potent than vitamin C and E. Tea catechins and polyphenols are effective scavengers of reactive oxygen species in vitro and may also function indirectly as antioxidants through their effects on transcription factors and enzyme activities [7]. Green tea when incorporated in ghee could enhance the shelf life of ghee. Merai *et al*. [8] reported that water- fraction of Tulsi *(Ocimum sanctum L.)* leaves possess good antioxygenic properties and phenolic substances present in Tulsi leaves were the main factors in extending the oxidative stability of ghee *(butterfat).*

Satavari (*Asparagus racemosus*) is antispasmodic and diuretic and helps in strengthening the patients in overcoming the effects of chemotherapy during the treatment of cancer. It also bolsters the immune system - good for AIDS, and has many other known health promoting properties for women. Asparagus racemosus is reported to have immunostimulant, anti-hepatotoxic, antioxytocic activities [9], antioxidant, and anti-diarrheal activities in laboratory animals [10]. Pawar *et al.* [11] added shatavari in ghee and checked its antioxidant activity in ghee and concluded it as a natural antioxidant.

Brahmi (Centella asiatica) is a nervine rejuvenative. It finds application in immune system strengthening, mental function, nervous disorders, epilepsy etc. Brahmi Ghrita is a very famous Ayurvedic medicine, in herbal ghee form. It is used for preparatory procedure for Panchakarma and also as medicine, mainly for treatment of improving intelligence, learning skills and speech. Aswagandha (*Withania Somnifera*) is known

for its action as immune booster and general tonic. Its manifold uses include treatment of patients suffering from breathing difficulty, Alzheimer's disease, cancer for general strength during and after chemotherapy, immune system problems, insomnia etc. Trifala has three active herb preparations (Amalaki, *Emblica officinalis*; Haritaki, *Terminalia chebula,* Bibh itaki, *Terminalia belerica*).

Withania somnifera is one of the major herbal components of geriatric tonics, this plant is also claimed to have potent aphrodisiac, rejuvenative and life prolonging properties [12]. Pawar *et al.* [11] added Aswagandha in ghee and checked its antioxidant activity in ghee and concluded it as a natural antioxidant.

It nourishes the nervous system, blood and muscles and increases digestion. Triphala is also widely taken for all eye diseases including the treatment of conjunctivitis, progressive myopia and cataracts. Its major health benefits are:

1. Acts as an antioxidant
2. Improves digestion and prevents constipation
3. Removes toxins from the body
4. Improves blood circulation and increases blood flow
5. Controls blood pressure
6. Cures various liver disorders and acts as an expectorant and corrects diverticulitis
7. Tonifies the gastro intestinal tract and stimulates bile flow
8. Nourishes nervous system and enhances immune system
9. Reduces heart diseases
10. Effective in Irritable Bowel Syndrome and Ulcerative Colitis
11. Promotes glow on skin and delays wrinkles.

P. tuberosa is used in traditional medicine as a fertility control agent, and as an aphrodisiac, cardiotonic, diuretic and galactogogue. In Ayurveda system, the flowers are used as cooling agent and as aphrodisiac, while roots act as a demulcent and refrigerant in fevers. The root tuber is sweet, oily, cooling, tonic, and effectively used as aphrodisiac, galacatagogue and diuretic. It is also used to cure leprosy, diseases of blood and urinary discharges. It is employed as an emetic, tonic and also believed to be a lactagogue [13]. In folk medicine the root tuber is applied for blood purification and to improve sperm production. The shade dried root powder controls overgrowth in stomach. The consumption of raw root for one month leads to sterilization in women [14]. Gandhi *et al*. [15] incorporated Vidarikand herb in ghee and reported its antioxidant activity to be higher than shatavari and aswagandha. Arjuna, a traditional Indian herb, is used widely for its heart related benefits: it regularizes the heartbeats, strengthens heart muscles and reduces bleeding and inflammation. Arjuna has been described as a Cardiac tonic named "Nadisarjja" in Ancient Indian scripture [16]. Arjuna is a proven herbal remedy for cardiovascular diseases [17], Ayurveda recommends use of Arjuna ghee (medicated butter) made with decoction and powder of bark [18]. Though Arjuna ghee is commercially available in market, it is sold primarily as a medicine. These products have medicinal flavour, bitter taste and darker colour and are therefore not acceptable as culinary item. Hence in order to overcome this and to offer to the consumer a functional ghee which has all the medicinal properties of Arjuna ghee but is quite similar to commonly used ghee in terms of flavour, texture, colour and other physical properties, a new product was developed. The new herbal ghee is quite similar in colour, flavour and taste with the normal ghee, so it is as acceptable as normal ghee and at the same time it provides all the cholesterol reducing benefits. The shelf life of herbal ghee developed is almost 3 times the shelf life of controlled ghee sample at 80 °C.

CONCLUSION

Use of Herbs in ayurvedic medicines, being free from any side effects when compared to the synthetic medicines is becoming a trend in the current era. Ghee could absorb all the fat soluble and water soluble components from the herbs enhancing their effectiveness. Therefore, it is used as a base material for the preparation of many ayurvedic and unani medicines, when striving to bring healing to the deep tissues of the body. Ghrta (Herbal ghee) is excellent for bringing balance and enhancing health and longevity. Quest for herbs with ability to treat serious diseases like

cancer is increasing and, knowing the fact that herbs with ability to treat serious diseases like cancer is increasing and, knowing the fact that ghee is the efficient carrier for them, could form the basis of the projects taken up by the scientists and researchers ghee is the efficient carrier for them, could form the basis of the projects taken up by the scientists and researchers.

REFERENCES

1. Gesler W M. Therapeutic landscapes: medicinal issues in light of the new cultural geography. *Social Science and Medicine*. 1992; 34: 735–746p.
2. Tyler V E. Herbs of Choice: The Therapeutic Use of Phytomedicinals. New York, NY: Pharmaceutical Product Press; 1994.
3. Pandya N C, Kanawjia S K. Ghee: A Traditional Nutraceutical. *Indian Dairyman*. 2002; 54(10): 67–75p.
4. Mehta B M. Ragi (*Eleusine coracana L*)-a natural antioxidant for ghee (butter oil). *International Journal of Food Science and Technology*. 2006; 41: 86p.
5. Werkhoven. *Journal of Tea Processing*. 1978; FAO, Rome, Italy.
6. Zhu N, Huang T C, Yu Y, *et al*. Identification of oxidation products of (+)-epigallocatechin gallate and (-)-epigallocatechin with H_2O_2. *Journal of the Agricultural and Food Chemistry*. 2000; 48: 979p.
7. Higdon J V, Frei B. Tea catechins and polyphenols:health effects, metabolism and antioxidant functions. *Critical Reviews in Food Science and Nutrition*. 2003; 43: 89p.
8. Merai M, Boghra V R, Sharma R S. Extraction of antioxigenic principles from Tulsi leaves and their effects on oxidative stability of ghee. *Journal of Food Science and Technology* 2003; 40: 52–57p.
9. Goyal R K, Singh J, Lal H. Asparagus racemosus – an update. *Indian Journal of Medical Research*. 2003; 57: 408–414p.
10. Bhatnagar M, Sisodiya S S, Bhatnagar R. Antiulcer and antioxidant activity of Asparagus racemosus WILLD and Withania somnifera DUNAL in rats. *Annals of the New York Academy of Sciences*. 2005; 1056: 261–270p.
11. Nilkanth P, Gandhi K, Purohit A, *et al*. Effect of added herb extracts on oxidative stability of ghee (butter oil) during accelerated oxidation condition. *Journal of Food Science and Technology*. 2002; DOI 10.1007/s13197-012-0781- 1(online published).
12. Sharma P V, Dravyaguna Vigyan. Chowkambha Sanskrit Sansthan 1997.
13. Kirtikar K R, Basu B D. Indian Medicinal Plants. 2nd Edi, *International Book Distributors, Rajpur road*, Dehradun, India 1993; 4: 2435–2438p.
14. Venkata R K, Venkata R R. Preliminary phytochemical and antimicrobial properties of *Pueraria tuberosa* (wild) DC: a potential medicinal plant. *Ethnobotanical Leaflets*. 2009; 13: 1051p.
15. Gandhi K, Arora S, Nilkanth P, *et al*. Effect of Vidarikand (extracts) on oxidative stability of ghee: A comparative study. *Research and Reviews: Journal of Dairy Science and Tech*nology. 2013; 2: 1p.
16. Sivalokanathan S, Vijayababu M R, Balasubramanian M P. Effects of Terminalia arjuna bark extract on apoptosis of human hepatoma cell line HepG2. *World Journal of Gastroenterology*. 2006; 12(7): 1018–24p.
17. Dwivedi S, Terminalia arjuna, Wight & Arn.- A useful drug for cardiovascular disorders. *Journal of Ethnopharmacology*. 2007; 114(2): 114–29p.
18. Singh H. Prospects and challenges for harnessing opportunities in medicinal plants sector in India. *Law, Environment and Development Journal*. 2006; 196p.

Cite this Article
Kamal Gandhi, Darshan Lal. Potential of Herbal Nutraceuticals in Ghee: A Review. *Research & Reviews: Journal of Dairy Science and Technology*. 2015; 4(2): 1–5p.