

## CRITICAL REVIEW OF COW GHEE INTAKE AND ITS RELATION WITH PRAMEHA OR DIABETES

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### ABSTRACT

Diabetes or *Prameha* cause mortality and morbidity worldwide. India is a Diabetic capital of World, where more than 65 millions people are suffering with this disease. Conventionally held notions that all saturated fatty acids, including those from dairy products, are detrimental to health have recently been challenged. Cow ghee is used as daily routine dietary item in Indian subcontinent from centuries. Cow ghee contains saturated fatty acids, Conjugated Linoelic Acid, and antioxidants etc. which makes it less harmful by not increasing the blood cholesterol levels as much as other saturated fats do, Animal studies shown that consumption of 2.5-10% Cow ghee in diet lower levels of arachidonic acid metabolites. Some of the specific

components of Cow ghee are inversely associated with diabetes. In Ayurveda Cow ghee is considered as *Ojas* and immunity booster, Premier *Rasayana* etc. and ideal for daily use. So many Cow ghee preparations are used in *Prameha* treatment. Aim and objective of this study was to establish the probable role of Cow ghee in prevention and treatment of Diabetes as a dietary supplement. This was a review study. Conclusion - this study suggests that specific components of Cow ghee are inversely associated with Diabetes and its use in proper quantity may be beneficial in preventing and treating *Prameha* or Diabetes and its related complications.

**KEYWORDS:** Diabetes, Cow ghee, CLA (Conjugated Linoelic Acid), Prameha.

## INTRODUCTION

In Ayurvedic science Diabetes can be correlated with the *Prameha*. Current dietary guidelines for prevention of diabetes aim at substituting saturated fatty acids with unsaturated fatty acids.<sup>[1]</sup> Moreover, recent literature suggests a potential role for dairy product–derived fatty acids in the prevention of diabetes.<sup>[2,3]</sup> In addition, dairy products are rich in calcium, vitamin D (dependent on whether vitamin D fortification of dairy products has been applied), and magnesium, which may also protect against diabetes.<sup>[4,5]</sup> The association of total dairy product intake with diabetes incidence is thus far inconclusive but generally points toward an inverse association.<sup>[6-10]</sup> Chemically it is a complex lipid of glycerides, saturated fatty acids, phospholipids, sterols, fat soluble Vitamins A, D, E and K, carotenoids, calcium, magnesium, iron, CLA [Conjugated Linoelic Acid], DHA (Docosahexaenoic acid) etc. There has been a concern about the possibility of ghee is detrimental to health due to its high percentage of saturated fatty acids. We Indians are using Cow ghee in cousins for generations where as epidemic of Diabetes, Cardiovascular disease etc. in India began 2-3 decades ago.<sup>[11]</sup> This may be due to the replacement of traditional fat by trans-fatty acids, *vanaspati* ghee (hydrogenated ghee), palm oil etc. Introduction of western life style and diet (junk foods, preserved foods etc.), refined sugars, urbanization, motorization etc. also increases incidence of Diabetes in India.<sup>[12]</sup>

Though allopathic medicine has demonized saturated fats for decades, studies are starting to prove that they are essential for optimum health. Aim and objective of this study was to establish the probable role of Cow ghee in prevention and treatment of Diabetes as a dietary supplement. The details of the concerned subject have been obtained from various sources such as Classical literatures of Ayurveda, Modern texts, online searches, Papers (journal publications etc) Support groups etc.

### Cow ghee and Ayurveda

In Indian subcontinent Cow ghee is an integral component of diet from centuries. Cow ghee has been used to improve physical and mental health as well as in the various ailments. In Ayurveda daily consumption of Cow ghee in proper quantity considered as best *Rasayana*.<sup>[13]</sup> It promotes lifespan and protects from many diseases. It enhances digestive power, absorption and assimilation in the body. It strengthens the nervous system and brain by nourishing *Ojas* and *Dhatu*s therefore improves memory.<sup>[14]</sup> It alleviates *Vata*, *Pitta* and also acceptable for *Kapha Prakriti*.<sup>[15]</sup> Sedentary lifestyle and over consumption of sweet and

unctuous substances are basic etiological factors of *Prameha*. Due to these factors *Kapha* and *Meda* is increased in our body which disrupts the metabolism and results in *Prameha*.<sup>[16]</sup>

Palliative therapy as well as Bio purificatory processes (*Panchakarma*) is mentioned by Ayurvedic scholars in the management of *Prameha*. In *Vataja Prameha* as well as if there is an involvement of *Pitta* Cow ghee can be used. *Prameha* is described as *Snehanayogya* disease. Several medicinal Cow ghee preparations are indicated in Diabetic treatment.<sup>[17]</sup>

**Table 1. Different ghee preparations mentioned in Prameha Chikitsa.**

Dhanvantar Ghrita	Sushruta in Su.Chi.12/05
Trikantakadi Ghrita	Charaka in Ch.Chi. 06/34
Dadimadi Ghrita	Bhesajya ratanavali Prameha Chikitsa chapter
Paniyakalyanak Ghrit	Sharangadhara madyakhanda, 9 <sup>th</sup> Chapter
Singhaamrita Ghrit	Yogratnakar Uttarkhanda Prameha Chikitsa.

### Cow ghee and Phylloquinones and Menaquinones

In Ayurveda Cow ghee is prepared from *Dahi*. In this process curd is added in cooled boiled milk and left for overnight. Next day this coagulated milk is churned and butter is extracted from this so called *Dahi*. This butter is heated to obtain ghee. During this process fermentation related mechanism produce phylloquinones and menaquinones with the help of probiotic bacteria in *Dahi*. These menaquinones have been inversely associated to the type 2 Diabetes.<sup>[18,19]</sup> Some study reported that higher total dairy products intake is associated with decreased Diabetes risk.<sup>[20,21]</sup> High fiber and low fat diet predicts long term weight loss and decreased type 2 Diabetes by improving insulin resistance.<sup>[22]</sup>

### Cow Ghee and Saturated fatty acids

Cow ghee is composed of several types of saturated fatty acids like short chain, medium chain and long chain fatty acids. Though it has a relatively high-level of saturated fatty acids, more than quarter of them are constituted by short- and medium-chain ones<sup>[23, 24]</sup>, which are readily utilized as an energy source. These acids neither increase blood lipid levels nor are deposited in adipose tissues.<sup>[25, 26]</sup> Animal studies have demonstrated many beneficial effects of ghee, including dose-dependent decreases in serum total cholesterol, low density lipoprotein (LDL), very low density lipoprotein (VLDL), and triglycerides; decreased liver total cholesterol, triglycerides, and cholesterol esters; and a lower level of non-enzymatic-induced lipid per oxidation in liver homogenate.<sup>[27]</sup> Odd chain fatty acids like Pentadecanoic

acids and Heptadecanoic acid are synthesized only in the rumen of ruminants. They have positive effect on cardiovascular system and associated with reduced risk of Diabetes<sup>[28,29]</sup>

Cow ghee is a very good source of Conjugated Linoleic Acid (CLA). CLA has shown antidiabetic effect in animal studies due to complex regulation of the genes important in reducing adiposity, improved insulin action and signal transduction in skeletal muscles.<sup>[30]</sup>

### **Cow ghee and antioxidants**

Potential protective constituents in Cow ghee includes carotenoids, Vitamin A, D, E (antioxidants), Mg and Ca. all these substances have shown antidiabetic activity.<sup>[31-36]</sup>

Diabetes is known to increase the risk of heart, cerebral, and vascular diseases by 2-7%. Trans-palmitoleic acid found in dairy fat lowers risk of type 2 Diabetes and related metabolic abnormalities.<sup>[37]</sup>

### **Cow ghee and Insulin regulation**

In Ayurveda Cow ghee is mentioned as Medhya, Smritivardhaka or memory enhancer. Modern science research reveals that the insulin significantly improves the cognitive performance and has a definite role in learning and memory<sup>[40,41]</sup> and Cow ghee is also a memory enhancer as per Ayurvedic science so it may be possible that Cow ghee in proper quantity have some positive effect on insulin regulation.

### **Cow Ghee and Prevention of Diabetes complications**

DHA helps in hypertension, atherosclerosis, adult onset Diabetes, MI, thrombosis etc.<sup>[38]</sup> Dwivedi et al shows that consumption of 10% Cow ghee in diet had a positive effect on serum lipid profile. Linoleic acid in Cow ghee decrease inflammatory mediators such as leucotrienes, prostaglandins and interleukins. The ability of ghee to lower the levels of Arachidonic acid metabolites is also beneficial in preventing the complications of Diabetes such as CVD, Atherosclerosis etc.<sup>[39]</sup>

### **CONCLUSION**

This study does not support a role for Cow ghee in prevention and treatment of Diabetes. However findings suggest inverse association with specific components of Cow ghee with Diabetes. In *Prameha* management *Ushna* and *Ruksha* substance rich diet is prescribed. Cow ghee has *Sanskara anuvartana* properties means when if it is taken with *Ushna* and *Ruksha* substances it becomes *Ushna* and *Ruksha* in nature and it increases digestion, assimilation

and absorption of *Ahararasa*.<sup>[42]</sup> It is a better cooking medium in comparison to refined oils, vanaspati ghee, palm oil and Buffalo ghee etc. Cow ghrita consumption should be in proper quantity because in Ayurveda over consumption of any food item produce *Amapradosaja* diseases<sup>[43]</sup> like *Prameha*. Further studies will improve our ability to detect and understand the role of Cow ghee intake in the prevention and treatment of Diabetes.

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