INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES
[ISSN: 0975-4725; CODEN(USA):IJPS00]
Journal Homepage: https://www.ijpsjournal.com

OPEN ACCESS

Review Article

A Review On To Expose The Effect Of Plant Ghee And Animal Ghee On Biochemical Parameters

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ARTICLE INFO

Received: 26 March 2024
Accepted: 30 March 2024
Published: 02 April 2024
Keywords:
Plant Ghee, Animal Ghee, Vanaspati ghee, Immunity, UFA, PUFA, Anti-inflammatory.
DOI:
10.5281/zenodo.10908491

ABSTRACT

Ghee is used in various purpose but, in Indian ghee is used as a vehicle in many Ayurveda medicinal purposes to treat various diseases. The study aim is purpose to expose of effect of both plant ghee and animal ghee on various biochemical parameters. Types of ghee are available in market i.e. plant ghee and animal ghee. Animal ghee: Cow ghee - this is categories into grain-fed and grass-fed. Grain-fed ghee is made from the milk of a cow. It contains a fat-soluble vitamins and heart healthy CAL. It is used to reduce the steroids and antibiotics activity. Grain-fed ghee comes from cows exclusively fed on grass. Grass-fed milk has more nutrition and benefits than grain fed. The ghee from grass-fed milk is superior in quality. Unsaturated saturated fatty acids are of two types i.e. MUFA and PUFA. The plant ghee and animal ghee having a various clinical use. Plant ghee is used as a anti-inflammatory, anti-cancer, vitamin A intake boost and also used in cough. Plant ghee is used in preparing bakery food like puffs, khari, breads and biscuits, nankhati, cakes, sweets and ice-creams too. The chemical composition of plant ghee and animal ghee is reviewed. One theory suggests that its lipid peroxidation that causes fat to become atherogenic (plaque forming) and animal saturated fat is resistant to the oxidation process and hence cannot cause the formation of plaque. On the contrary vegetable Polyunsaturated Fatty Acids (PUFA) are readily oxidized and PUFA-cholesterol esters are implicated in the process of plaque formation. Another theory suggests that Ghee is rich in Antioxidants including Vitamin A, Vitamin E and carotenoids which may be helpful in preventing lipid peroxidation.

INTRODUCTION

Ghee commonly called “Gritha” in Sanskrit, has been utilized for thousands of years in Ayurveda

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Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

as part of diet. According to Ayurveda, ghee promotes longevity and protects body from various diseases.It increases digestive fire and improves absorption and assimilation. It nourishes, ojas, very clever essence of all the body tissues. It improves memory and strengthens the brain and nervous system. It lubricates the connective tissues, thereby rendering the body more flexible. In India ghee was used as a vehicle in many Ayurveda Medicinal preparations. Ghee cools the body and prevents overheat. Ghee makes internal body organs smooth and soft and also increases secretion of internal juices, which are diminished by aging.[1] Indian population uses ghee in their regular diet. Ghee can be made from the milk of different animals. Ayurvedic classical texts described eight kinds of ghee from eight different animal milk and ghee made from cow milk is said to be superior among them, whereas ghee of ewe milk is said to be inferior. Maharsi Caraka has mentioned it as Ahridya (detrimental to heart).[2] Dairy activities and business have traditionally been rooted to India's rural economy. India is the leading producer and consumer of dairy products. In ancient India, ghee (Ghrita) was produced far back as 1500 BC (Achaya, 1997). Some reports have also mentioned similar type of product in Middle East, available probably since same ancient times (Abdalla, 1994). The term “Desi ghee” is generally used for milk fat obtained from fermented milks whether from cow or buffalo in which curd has to be churned to form butter followed by heat clarification to the separate out fat from non-fat medium. It remains a top choice among households in India in comparison of other fats/oils, with some trusted brands (Gowardhan, Anik, Milkfood, Madhusudhan,Verka, Amul, Healthhaid, Gopaljee,NestleEveryday, Patanjali and Britannia) having their stronghold in the market. However, it is essential for good health up to some extent, consuming it beyond the individual limit may show detrimental health effects, because of having cholesterol content and is also highly saturated in nature.[3]Dalda was founded under the name "Vanaspati." It started in 1937; the year an oil company was founded, which led to Dalda Foods' eventual success. Since then, it has grown a lot and added value to the lives of its customers by offering healthy options.the most common type of hydrogenated vegetable oil is known as "vanaspati ghee." In 2003, Unilever made the decision to market Dalda in Pakistan and India.[4The anti oxidant properties of ghee help to prevent neurological diseases & increase HDL level of the blood and reduce LDL level of the blood. Ghee is known to be digested 96% which highest as compare to other vegetable and animal source fats.[5]Unilever Laboratories, Holland has developed Virtually Trans fatty acid Free (VTF) technology, which has been introduced in Pakistan by Lever Brothers to provide virtually trans fatty acid free (VTF) Daldabanaspati.Trans rich fats significantly elevated total cholesterol and LDL and depressed HDL-cholesterol relative to all fats tested.[6].Ghee is used to improving voice complexion, promoting memory, intelligence and power of digestion, boosting up immunity, helping in absorption of vital nutrients, lubricating the connective tissues there by rendering the body more flexible. Ayurveda described for the regular consumption of Ghrita as it boosted the mental as well as physical strength of the individual and also warded off diseases.[7]

Figure 1: Animal Ghee

Types of Ghee[8]:

You will find many types of ghee available in the market. However, broadly, it can be classified by source and feed.

Cow Ghee:

It prepared by the cow or buffalo milk.It mainly used in food also in drugs also. Cow ghee can be categorised into grain-fed and grass-fed cows.

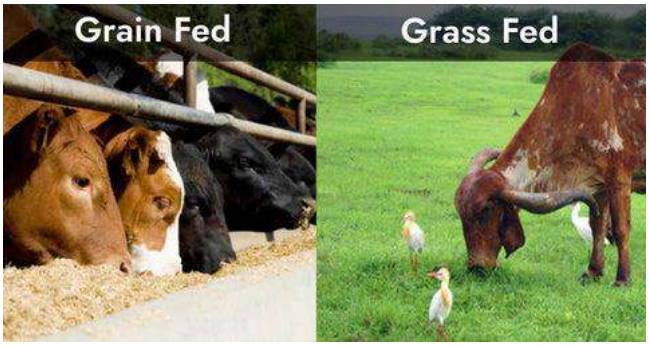

Figure 2: Categories of Cow Ghee

1. Grain-fed ghee is made from the milk of a cow that is largely fed on a diet of grains and other feed that are not grass-based. The milk from these cows might contain residues of steroids and antibiotics administered to these cows. Milk, and therefore, ghee from grain-fed cows is inferior in quality.
2. Grass-fed ghee comes from milk produced by cows exclusively fed on grass. Cows are allowed to graze on green pastures. Grass-fed milk has more nutrition and benefits than grain-fed. The ghee from grass-fed milk is superior in quality

Unsaturated Fatty Acids Types:

There are two types of good unsaturated fatty acids,

1. MUFA
2. PUFA.

Monounsaturated fatty acids (MUFA):

By chemical definition, MUFAs are FAs that have only 1 unsaturated carbon bond. Oleic acid (OA; 18:1n–9)2 and palmitoleic acid (PO; 16:1n–7) are the most common MUFAs although many less abundant MUFAs species exist. In addition to obtaining MUFAs from the diet, MUFA can also be synthesized by elongate and desaturase enzymes from SFAs primarily derived from de novo lipogenesis. From a nutrition standpoint, MUFAs have mixed effects on human health. However, recent evidence tends to indicate more beneficial effects, in particular, on reducing risk of cardiovascular diseases and other inflammation-related diseases, although these effects differ between the individual MUFAs. Accordingly, MUFA-enriched foods such as olive oil are among highly recommended healthy foods..[9]

Polyunsaturated Fatty Acids (PUFA):

PUFAs have been claimed to have a broad range of beneficial effects including lowering cholesterol, decreasing the risk of arrhythmia, lowering the blood pressure, preventing diabetes in pregnancy, and beneficial effects on joints (relief of arthritis). Both omega-3 and omega-6 PUFA are precursors of hormone-like compounds, which are involved in many important biological and biochemical processes in human body. They are indispensable for the syntheses of prostaglandins, thromboxanes, prostacyclines and leukotrienes and take part in the transport and oxidation of choles-terol. PUFAs are important constituents of the phospholipids of all cell membranes. [10]

Figure 3: Plant ghee

Health Benefits of Ghee:

Animal Ghee:[11]

1. Wound healing properties
2. The function of cow ghee in prevention and treatment of diabetes
3. Ghee helps in digestion

4. Useful in preventing oxidative damage to the body & brain.
5. Ashwagandha ghrita for GI disorder its manifold uses include treatment of patients suffering from breathing difficulty, alzheimer disease, cancer for general strength during and after chemotherapy, immune system problems, insomnia
6. Cow ghee is the most preferred base for preparing any medicine because it can reach the deepest of tissues in the human body and nourish it Ghee is a rich source of Omega-3 fatty acids, a natural antioxidant and prevents degenerative changes in musculoskeletal system, prevents premature ageing. [12]
7. It has anti-ageing factors, exhibits antichollestric and immunostimulant activity, good for cholesterol and heart patients. Cow butter is a blood purifier, increases the beauty. Cow ghee promotes healing of wounds, helpful in preventing and controlling paralysis and asthma. [13]
8. Improves weight management by removing excess fat , Improves cognitive functions, intelligence, learning skills , Improves eyesight and prevents irritation.[14]
9. Ghee can be used to treat a variety of ailments, including epilepsy, intoxication, fainting, malaria, illnesses of the head, eyes, and ears, and some conditions affecting the female reproductive system.[15]

Plant Ghee:

1. dalda to make foods more delicious and tasty.[16]
2. DALDA is a potent and highly selective μ-opioid receptor agonist with a Ki of 1.69 nM. DALDA shows antinociceptive and respiratory effects[17]

Various Treatments using Ayurvedic Ghee[18]

Role of Goghrita in certain disorders Go Ghrita is considered superior to ghrita obtained from milk of other animals. It is effective in Vata and Pitta disorders. According to Ayurveda, consumption of ghee in medicinal proportion is beneficial for general mental and physical health. It is Sapta dhatu vardhak, Ojo vardhak and Kaantivardhak. It is Buddhivardhaka (enhance intelligence), Smritivardhaka (enhancing memory), Deepana (improves appetite) and is useful in the treatment of Unmada, Apasmara, Murccha and Mada Bleeding through nose- Few drops of goghrita in each nostril stops the bleeding from nose. Burn injuries- Goghrita is used as ointment on burned site.

- Reducing toxic effects of dhatura, Raskarpoor- Intake of Goghrita reduces toxic effect of Dhatura and Ras karpoor.
- Migraine- In migraine, Cow ‘s ghee can be used for nasya. Few drops of this ghee in each nostril, twice a day for one week or 10 gms Cow‘s ghee mixed with Misri orally once a day every morning for three day .
- Alcohol Intoxication- In alcohol intoxication, 24grams of Goghrita is given with same amount of misri.
- Hiccups- Intake of Goghrita is helpful.
- Excessive cough in children- Massaging on chest with Goghrita is helpful.

Chemical Composition of Ghee:[19]

Table 1. Compositional and physico-chemical properties of ghee residue.

Parameter	Mean value
Moisture (%)	17.12
Fat (%)	47.37
Protein (%)	24.85
Ash (%)	2.8
Total carbohydrate (%)	7.85
FFA (% Oleic Acid)	0.655
Acidity (% LA)	0.22 pH 6.3
TBA (mg malonaldehyde/g product)	0.135
HMF (μ moles/100g)	161.37

Chemical Composition of Plant Ghee:[20]

Table 2: Fatty acids composition of vanaspati ghee and cooking oil samples

Fatty acid	Vanaspati ghee (VG)		Cooking oil (CO)	
	Range (%)	Mean value (%)	Range (%)	Mean value (%)
SFA	40.88-49.44	44.98	13.56-47.56	30.83
UFA	50.55-59.09	55.00	52.43-86.10	69.02
Total MUFA	43.17-52.22	47.51	40.41-62.51	49.26
Cis-MUFA	33.41-44.93	39.53	39.64-62.33	48.38
Total PUFA	3.43-11.18	7.49	10.17-35.32	19.90
Cis-PUFA	3.44-11.18	7.40	10.17-35.32	19.86
Total TFA	2.83-15.43	8.08	0.32-1.48	0.91
SFA+TFA	49.22-59.25	53.06	13.88-48.35	31.74
SFA/UFA	0.69-0.98	0.82	0.16-0.91	0.50
Cis- MUFA +Cis- PUFA	40.74-50.77	46.93	51.64-86.10	68.24
Cis-PUFA/SFA	0.07-0.25	0.17	0.21-1.86	0.94
Trans-FA/Cis-FA	0.06-0.38	0.18	0.00-0.02	0.01
Cis-PUFA/(SFA+TFA)	0.06-0.22	0.14	0.21-1.71	0.90
CisMUFA+PUFA/SFA+TFA	0.69-1.03	0.89	1.07-6.20	2.89

Comparative Study of Ghee:

Table 3: Comparative Study of Ghee

Sr. No	Ghee Impact On	Action	Disease	Treatment
1[21]	Blood &Liver Lipids	Liver Lipid Reduced	CVS	Consumption Of 10% Level of Ghee Indiet Alter Blood Lipid Profile Not to Elevate Risk Factor For CVS
2[22]	Lipid Metabolism	Liver Inflammation	Lipid Metabolism Disorder	Yak Ghee Can Improve Lipid Metabolism Disorders Caused by HFD And Prevent the Occurrence of Liver Inflammation.
3[23]	Skin ,Lungs	Anti-Aging, Anti-Oxidant,	CNS Disorders.	Increases In the Absorption and Transportation of Essential Phytoconstituent and Access Their Availability to The Brain And Other Target Site.
4[24]	Glucose Level	Anti Diabetic	Diabetes	Cow Ghee Itself Decreases the Glucose Concentration in Diabetic Induced Wister Rats
5.[25]	Body Hind Limbs	Chronic Anticonvulsant Effect	Neurological Disorder	Lipophilic Nature Allows The Drug to Cross the Blood Brain Barrier Effectively and Induce the Effect
6[26]	Female Hormonal Functions, Follicular Cells, Follicular	Improved Female Fertility- Related Parameters, Increased Female Fertility	Female Infertility, Ovarian Dysfunction, Necrosis or Apoptosis	Ghee Is an Excellent Source of Conjugated Linoleic Acid (CLA) That Improves Female Fertility Hormone

	Follicles, Granulose Cells	Hormones Levels and Antioxidant Enzyme Activity		Involving Improved Ovarian Follicular Steroidogenesis The Increased Female Fertility Hormones Levels And Antioxidant Enzyme Activity By Ghee
7[27]	Hemoglobin(Hb), Red Blood Cells (Rbcs), And Hematocrit (HCT)	Hematology.	Decrease In Rbc	Normal Ghee Fed Rabbits Showed No Significant differences, Comparing to Control.
8[28]	Wounds	Wound Healing and Antiulcer Activity, Antifungal Activity	Wounds, Allergy	Ghee Contains Several Saturated and Unsaturated Fatty Acids Which Are Capable of Taking Part In Metabolic Processes Involved In Any Wound Healing.
9[29]	Cholesterol , Lipid , Lipoproteins, Triglycerides	Anti-Atherogenic,	Arthritis, And ADHD, Hypocholesteremia Effect	Use Of Plain Ghee Along with Oxidized Ghee Helps To Decrease The Ill Effects Of Oxidized Ghee On Lipid Storage In The Liver On Histology.
10[30]	Lipid ,Body Weight	Antihyperlipidemia	Dyslipidemia Or Obesity	Ghee And Dalda Alter Lipid Profile As Significant Increasedserum Cholesterol And Triglyceride.
11[31]	Aerobic Plate Count And Yeast And Mould Content	Microbiological And Physic Chemical Qualities, Antioxidant Activity	Microbial Infection	Ghee Residue To Ghee Considerably Increased The Shelf Life Of Ghee. It May Be Due To High Content Of Phospholipids. Phospholipid Acts Synergistically With Reducing Substances In Ghee Residue And Protects It From Oxidative Defect.
12[32]	Cholesterol, LDL, VLDL, Triglycerides	Decrease In Serum Total Cholesterol, LDL, VLDL, Triglycerides And Decreased Liver Total Cholesterol.	Alcoholism, Hypertension, Diabetes, Myocardial Infraction Or, Angina	The Beneficial Effect Of Ghee On CHD May Be Due To Absence Of Cholesterol Oxidation Products (Cops) In Ghee.
13[33]	Memory, Mental Health, Behaviour	Hyperactivity And Irritability	Alzheimer's Disease Or Age Related Dementia, Memory Loss	The Traditional Texts Mentioned That Cow Ghee Is A Medhya Rasayana, Beneficial For Mental Alertness And Memory In Adults As Well In Children
14[34]	Intestine ,GIT	Promote Positivity, Growth And	Inflammation,Absorption Problem	Daily Consumption Of Ghee In An Adequate Amount, Imparts Various Health

		Expansion Of Consciousness		Benefits Such As Binds Toxins, Enhances Complexion And Glow Of The Face And Body, A Great Rejuvenator For The Eyes, Increases Physical And Mental Stamina Etc. In Addition To Providing Sustaining Energy.

Screening of Ghee:

As we know, cow ghee has various properties like antioxidant, anti-inflammatory, wound healing, etc., so in this study, it is used as an ointment base and other ointment bases and evaluated for its compatibility with other ointment bases. We conducted research combining various ghee concentrations with other bases that give Cow ghee's physical and chemical parameters. A total of nine ointment bases were prepared F1 to F9, the composition is given in, and all these are evaluated in terms of physical and chemical stability.[36]

DISCUSSION:

Ghee in spite of being a rich source of cholesterol and saturated fatty acids is considered good for the heart. One theory suggests that its lipid peroxidation that causes fat to become atherogenic (plaque forming) and animal saturated fat is resistant to the oxidation process and hence cannot cause the formation of plaque. On the contrary vegetable Polyunsaturated Fatty Acids (PUFA) are readily oxidized and PUFA-cholesterol esters are implicated in the process of plaque formation .Another theory suggests that Ghee is rich in Antioxidants including Vitamin A, Vitamin E and carotenoids which may be helpful in preventing lipid peroxidation. Cow Ghee is healthy for daily consumption because it contains healthy saturated fats, but vegetable oil or dalda ghee contain trans-fats which are harmful to health. Both vegetable and animal ghee which are used for cooking in India and other South Asian countries have extremely high trans fatty acid content.Also somehow it is beneficial for health such as CAD so the Indians immune system is strong than others. Ghee is anhydrous milk fat and is rich in saturated fat (62%), most of which are cholesterol-raising (myristic acid 17%, palmitic acid 26%).

CONCLUSION:

Ghee is considered assuperior to other fatty acids.it is beneficial for toxin binds,glow of face,increase physical and mental stamina.it is fat rich product therefore it is antioxidant play major role in preventing rancidity. .From improving lubrication between bones to adding healthy fats to your diet, pure ghee has formed a very special place in Indian household.

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HOW TO CITE: Shinde Ankita, Shinde Jagruti, Bondhare Nikhil, Kshirsagar Shubham, A Review On To Expose The Effect Of Plant Ghee And Animal Ghee On Biochemical Parameters, Int. J. of Pharm. Sci., 2024, Vol 2, Issue 4, 95-104. https://doi.org/10.5281/zenodo.10908491